

The moderation role of personal characteristics in the relation between work environmental characteristics and the number of over hours employees are willing to work

Evidence from 2017 ROA Public Sector Survey

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**The moderation role of personal characteristics in the relation
between work environmental characteristics and the number of over
hours employees are willing to work**

Evidence from 2017 ROA Public Sector Survey

Master thesis

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Official statement of original thesis

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Abstract

Purpose. The purpose of this thesis is to examine the relation between work environmental characteristics and the number of over hours employees are willing to work and the moderation role of personal characteristics. Furthermore, we analyze this relation for the demographic groups of employees as well as the contractual working hours of employees.

Data and method. This thesis will make use of a vignette study and a questionnaire survey which have been conducted in the ABP / ROA public sector 2017 survey in the Netherlands. This survey was answered by roughly 20.000 employees. Since we have 6 vignette observations for each employee, we have approximately 12.0000 usable observations.

Results. The analyses document a significant and positive relation between work environmental characteristics and the number of over hours employees are willing to work. We find this relation is partially moderated by bad health and age. Furthermore, we find that the number of over hours employees are willing to work decreases with age and increases with contractual hours in general.

Contributions. This thesis aims at indicating how work environmental characteristics affect the number of over hours employees are willing to work and to determine which employees (personal characteristics) are more sensitive to certain environment characteristics when deciding work over hours. Moreover, the results could also provide suggestions on which workers are able to deal with the increasing job demands due to increases in overtime hours, and which workers should be avoided when allocating job tasks which involve over hours.

Policy implications.

Due to overtime work becomes more and more needed in the world, as a result of tight labor markets, employers need to find ways to make employees to engage voluntarily in their job and tasks. This thesis' results are therefore of importance as they can help understand which work environment factors can positively influence the number of over hours employees are willing to work and which personal characteristics factors can strengthen the positive

relationship between work environmental characteristics and the number of over hours employees are willing to work.

Key words. Over hours, age, contractual hours, vignette experiment

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1. Introduction

1.1 Problem statement

Labor markets are becoming increasingly flexible and international competition is increasing fast, while the growth in labor supply declined due to the ageing of the labor market in most industrialized countries (Kodz et al., 2003). This increasingly leads to shortage on the labor market. Organizations therefore have great interest in motivating their employees to work overtime, in particular because they generally use overtime hours to increase firm performance by fully utilizing their internal human capital (Ko & Choi, 2018).

Overtime work becomes a common phenomenon in today's industrialized countries (Kodz et al., 2003). Pascal and Damien (2001) found that about 20% of the European full-time employees work 45 hours or more a week, and about 13% of the full-time employees even work more than 50 hours a week. Overtime work is in fact a common phenomenon all over the world. In Japan, the work week commonly exceeds 60 work hours per week (Beckers et al., 2004).

Little research, however, is done on the determinants of working overtime. This thesis will look more closely into these determinants. In my thesis, I will divide them into two categories. First are the work environment characteristics. The second are personal characteristics. I will perform causal analyses using a vignette experiment to determine the impact of work environment characteristics on the number of over

hours employees are willing to work. Moreover, I will perform moderation analyses in which I investigate to what extent personal characteristics affect the impact of work environment characteristics on the number of over hours.

1.2 Predicting the number of over hours employees are willing to work

The best situation for employees and employers is that the employee engages voluntarily into working overtime. Observed working hours in register datasets most likely will reflect both the professional and situational contexts as well as the preferences of the employee (Ng & Feldman, 2008), which cannot be precisely disentangled. In this thesis we try by using a vignette experiment to disentangle the preferences of employees to work overtime from the organizational characteristics and to investigate the impact of particular work environment characteristics on the number of over hours. We start these analyses by first questioning the general willingness to work overtime:

1) To what extent are employees willing to work over hours if these are asked to do this by their employer?

1.3 Predicting the impact of work environment characteristics on the number of over hours

I expect that the willingness to work overtime will depend on characteristics of the work environment. Based on previous literature I will investigate whether the willingness to work overtime depends on the freedom to plan the overtime hours over the workweek, the autonomy in the execution of task, how many other people are

asked to work overtime and the degree to which people can learn from the tasks performed in overtime.

Previous literature has shown that control over work overtime, which defines as “an employee's possibilities of control over the duration, position, and distribution of work time” (Harma, 2006) is important for how people perceive working in overtime (Beckers et al., 2008). Employees who have more freedom to plan overtime hours may be more willing to continue work over hours, but conversely, lack of work schedule control is associated with distress, dissatisfaction, poor general health, and minor physical problems (Fenwick & Tausig, 2001). Furthermore, Ala-Mursula found that high control over working time can support employees in finding an appropriate work-life balance, which means employees would feel more motivated to work over time since they have flexibility in time management.

The degree to which employee's perceive working overtime as heavy will also most likely depends on the type of task they have to perform. In particular, task autonomy is giving the individual who performs a task considerable discretion and control in deciding how to carry it out (Langfred & Moye, 2004). Task autonomy in turn has been proven to increase the motivating potential of a job (Hackman & Oldham, 1976; Langfred & Moye, 2004). Therefore, employees who have more task autonomy may be more likely to work over hours. Moreover, when the personal job involvement is high in the tasks which employees perform, we might expect that they are also more willing to work overtime since the preferences of employees also will play a role when planning to work overtime.

Babin and Boles (1996) further found that employee's perceptions of co-worker involvement and supervisory support can reduce stress and increase job satisfaction. Schachter (1959) also found that people feel less tense and nervous when performing with others than when performing on stage alone. Moreover, Jackson and Williams (1985) found that on difficult tasks, working collectively would result in improved performance. Because employees feel more relaxed when working with co-workers, it is also likely that this increases their work engagement, and hence is more willing to work overtime.

Rowden and Conine (2005) further found significant positive relationship between workplace learning and employees' job satisfaction. Rose, Kumar and Pak (2011) found that organizational learning was positively related to organizational commitment and job satisfaction. Therefore, workplace learning might be positively associated with planning to work overtime, where job satisfaction works as a mediator.

In conclusion, the studies above all give reason to believe that employees can be more willing to work over hours if they have more freedom, more autonomy, and more co-workers at the task. Moreover, employees are also more willing to work over hours if they have high personal involvement in the task and can learn more from the task. To further assess these assumptions empirically the second research question is formulated as follows:

2) To what extent can work environment characteristics increase the number of over hours employees are willing to work?

- a. *The freedom to plan the overtime hours over the workweek*
- b. *The autonomy in the execution of task*
- c. *The personal involvement in the task*
- d. *How many people were asked to perform the task*
- e. *The degree to which people can learn from the task*

1.4 The role of personal characteristics in predicting the impact of work environment characteristics on the number of over hours

Organization characteristics most likely do not motivate all employees equally to work overtime. In this thesis I will focus on three personal characteristics. First, I will focus on the role of having a part-time job. Second, I will focus on the role of health and age.

First, most part-time workers are women (OECD 1998) because they have more family responsibilities which also means they have less time for work (Booth & Van ours, 2009). Additionally, most of the men who have part time work have decreased their working hours because of health problems (Gonäs & Spånt, 1997). Hence, these workers experience more difficulties to engage in overtime work and we might expect that favorable organizational characteristics (such as more freedom in when one performs the overwork hours) have a greater impact on the number of hours part-time workers are willing to work overtime.

Second, previous research suggests looking at the role of health and age. Overtime work can lead to a situation of insufficient recovery which could disturb physiological

processes and, in turn results in health problems (Geurts & Sonnentag, 2006). Hence, being in good health is a vital condition for working overtime. Related to this is that health problems increase with age. For example, ageing has been found to decrease the ability for night work and increase sleep disturbances (Moneta et al. 1996). Costa and Sartori (2007) also found that the workability decrease as the age increases over years which result in the shorter working hours. In consequence, employees' willingness to work over hours might weaken with age.

Employees who are in bad health condition and who are older are therefore also more likely to be dependent on work characteristics to be able to perform over hours

Summarizing, with regard to personal characteristics I conjecture that factors such as gender (being female), bad health and age will strengthen the relationship between organizational characteristics and the number of over hours. Therefore, the third research question is:

3) To what extent do personal characteristics affect the impact of work

environment characteristics on the number of over hours?

a. Part-time job

c. Bad Health

d. Age

1.5 Data, Design and Findings

This thesis will make use of a vignette study which has been conducted in the ABP / ROA public sector 2017 survey in the Netherlands. This thesis will answer our research questions by making use of this vignette experiment. Within this experiment, workers were confronted with 5 different hypothetical situations in which they were asked to work 16 over hours in two weeks without compensation because of an additional job task. The circumstances in which they had to work overtime were randomly changed with respect to 1) the freedom to plan the overtime hours over the workweek 2) the autonomy in the execution of the task 3) how many people were asked to perform the task 4) the personal involvement in the task and the 5) degree to which people can learn from the task. These circumstances have been carefully chosen based on effort reward models and autonomy models. The randomization allows us to establish which of these circumstances are most relevant for the number of over hours employees are willing to work.

This survey was answered by roughly 20.000 employees. Since we have 6 vignette observations for each employee, we have approximately 12.0000 usable observations. Next to the vignette study, the dataset includes many validated scales on health, personality traits which can be used to explain the variation found in the vignettes.

1.6 Contributions to Research

This thesis aims at indicating how work environment characteristics affect employees' willingness to work over hours and to determine which employees

(personal characteristics) are more sensitive to certain environment characteristics when deciding work over hours. Moreover, the results could also provide suggestions on which workers are able to deal with the increasing job demands due to increases in overtime hours, and which workers employers should be avoided when allocating job tasks which involve over hours. This thesis adds to the existing literature by showing how employees' willingness to work over hours depends on the interrelation of the characteristics of job tasks and personal characteristics of employees. This particular interrelationship has not been investigated in the previous literature. Moreover, the vignette experiment allows us to make causal claims on the importance of job tasks characteristics.

1.7 Policy Relevance

It is important to map the factors (environment and personal) that can influence the number of over hours employees are willing to work, since the related research is limited, even though they play a large role in influencing employees' willingness to work over hours. Also, due to overtime work becomes more and more common in the world; employers need to find ways to make employees to engage voluntarily in their job and tasks. This thesis' results are therefore of importance as they can help understand which work environment factors can positively influence employees' willingness to work over hours and which personal characteristics factors can strengthen the positive relationship between work environment characteristics and the number of over hours.

1.8 Outline

This thesis is organized as follows; the three research questions form the basis of the theoretical framework that is presented in section 2. In this section I will further derive the hypotheses. Section 3 describes the data and methodology. Section 4 describes the results. Section 5 provides a discussion and a conclusion.

2. Theoretical Framework and Hypotheses

Organizations have great interest in motivating their employees to work overtime, in particular because they generally use overtime hours to increase firm performance by fully utilizing their internal human capital (Ko & Choi, 2018). Overtime work has become a common phenomenon in today's industrialized countries (Kodz et al., 2003).

There are only a limited number of studies on overtime work that focus on individual level preferences. Therefore, this thesis will focus on which factors can influence the number of over hours employees are willing to work. I propose several work environmental factors that can positively influence employees' decision to work over hours. I expect the characteristics of the task to influence the number of over hours, as employees are probably less willing to invest in additional time at work if they don't have sufficient freedom to plan and execute the task. Also, the number of co-workers of employees and the degree of employees can learn from the task will presumably affect whether they will devote additional time at work. Finally, I expect factors such as personal characteristics to play a moderating role in the relationship between work environment characteristics and the number of over hours. Below I derive corresponding hypotheses based on the current literature.

2.1 The Role of freedom to plan the overtime hours predicting the number of over hours

Control over work overtime, is defined as “an employee's possibility to exercise of control over the duration, position, and distribution of work time” (Harma, 2006). Becker (2008) distinguishes between two opposite poles of overtime control, namely voluntary overtime work (high over work time control) and involuntary overtime work (low over work time control) (Becker et al., 2008). Involuntary overtime work (low work time control) was associated with relatively high fatigue and low satisfaction, especially for involuntary overtime workers without rewards (Becker et al., 2008). This is also consistent with Effort Reward-Imbalance (ERI) Model (Siegrist, 1996, 1998). This theory posits that employees’ efforts at work are part of a social exchange process in which employees expect fair rewards for their invested efforts (Becker et al., 2008). Furthermore, this model can be translated to overtime work situations, since overtime implies investing extra work efforts, employees may ask for extra freedom as compensation. Therefore, employees who have less freedom to plan the overtime hours are easier to feel tired and have less job satisfaction (Golden & Wiens-Tuers, 2005).

Moreover, recent studies also showed that low work time control also increases the risk of health problems. Inversely, high control over working time reduces the adverse effect of work stress on absence and can support employees to find an appropriate work-life balance (Ala-Mursula, 2002). Becker and his colleagues’ study shows that high work time control is not only vital during contractual work hours but also equally important during overtime work, because employees who work over time would consider the freedom of scheduling overtime as their compensation of

investing extra work efforts. Therefore, mandatory overtime workers have more stress on their job since it's hard to balance family and work, while voluntary overtime might signal a good work-life balance.

In conclusion, higher overtime control workers have higher job satisfaction and lower risk of health problems. Those employees are more motivated and active when facing additional work hours since they know they don't need to do the task right now and they have sufficient freedom to decide when and where to do it. Also, employees with higher overtime control have better health status to work overtime because they could make a reasonable schedule to plan the tasks. Consequently, employees who have more freedom to plan their overtime hours have higher job satisfaction which may lead to a higher willingness to work over time. I therefore predict the following:

Hypothesis1(H1): The freedom to plan the overtime hours over the workweek will increase the number of over hours employees are willing to work.

2.2 The role of the autonomy of execution of the task and the number of over hours

Autonomy can be defined as the power of one person to control the method, the criteria and the schedule when completing his/her works (Breugh,1989). Task autonomy is defined as the degree to which an employee is given substantial freedom, independence, and discretion in carrying out a task, such as determining work schedule and work procedures (Hackman, 1980). Moreover, task autonomy can also

be considered a psychological state that represents an individual's orientation with his or her work role (Spreitzer, 1996). Therefore, an increase in task autonomy is associated with increased levels in the sense of belonging and job engagement of workers.

In general, empirical studies find that giving task autonomy to employees is resulting in higher motivation, job satisfaction, and work performance (McGrath & Argote, 2008). Moreover, there is empirical support for the relationship between task autonomy and performance (Spector, 1986). Specifically, autonomy is an important job characteristic that leads to the outcomes of increased motivation and work effectiveness (Hackman & Oldham, 1976). According to Hackman and Oldham (1976), autonomy leads to the critical psychological state -responsibility for outcomes of the work, which in turn leads to high work effectiveness and high internal work motivation. Consequently, increased job autonomy leads to increased productivity (James, 1992).

Moreover, task autonomy could bring some potential benefits to the employee. One potential benefit would be that the individual considers productivity as a desirable outcome, so perceived autonomy could allow him or her to be more productive (Langfred & Moyer, 2004). Other potential benefits are physical and psychological well-being (Langer, 1983). In this case, employees could invest more time and effort to work overtime because they are at good physical and psychological health. Moreover, high task autonomy will also increase the interest, creativity, cognitive flexibility of employees (Deci & Ryan, 1987). Therefore, employees will be

more willing to engage in and to make more effort in additional work tasks which may increase the overtime work hours.

Furthermore, task autonomy could also bring informational benefits which are expected from allowing participation in job-related decisions when an employee performing the task (Miller & Monge, 1986). More specifically, employees will be able to take advantage of that task-specific knowledge when making decisions about how to do the task (Langfred & Moye, 2004). Therefore, employees can gain lots of task-specific knowledge when having high participation in job-related decisions which may help them to increase the following performance. Therefore, employees feel more active and motivated to engage in additional job tasks.

In summary, giving task autonomy to employees leads to higher motivation and higher job satisfaction of employees which increase internal work motivation when employees facing additional job tasks (work overtime). Therefore, employees will be more willing to engage in and to make more effort in additional work tasks which may increase the overtime hours. Therefore, I predict the following:

Hypothesis1(H2): The autonomy in the execution of the task will increase the number of over hours employees are willing to work.

2.3 The Role of the personal involvement of employees in the task and the number of over hours

Engaged employees are more willing to invest extra efforts on work which means they are more willing to work over hours. Engaged employees are more willing to step outside the bounds of their formally defined jobs (Rich, Lepine & Crawford, 2010). Engagement, traditionally focus on physical or cognitive effort allocated to specific tasks or sets of tasks, as it reflects bringing forth increasing depths of one's broadly defined role (Rich, Lepine & Crawford, 2010). Engaged individuals are described as being psychologically present, connected, integrated, and focused in their role performances. Engagement is also observed through the behavioural investment of personal physical, cognitive, and emotional energy into work roles (Kahn, 1992).

Moreover, engaged individuals will also have perceptions of job involvement during their work. Job involvement, refers to the degree to which employees consider their jobs as comprising their lives in total, so that an employee who exhibits high job involvement thinks about the job even when outside of work (Kanungo, 1982). Work over hours requires employees to work outside the work time. Also, employees who are highly engaged in their work roles not only focus their physical effort on the pursuit of role-related goals, but are also cognitively and emotionally connected to the effort (Ashforth & Humphrey, 1995). Therefore, they are more willing to invest more physical effort on the pursuit of job goals. I conjecture that:

Hypothesis1(H3): The personal involvement in the task will increase the number of over hours employees are willing to work.

2.4 The role of the peers and the number of over hours

Co-operative behaviours are beneficial to the co-workers and employees may benefit from these behaviours because it enables them to do a better job in a more pleasant environment (Lambooijet al., 2007). Also, co-operative behaviour is an exchange able good in the exchange relationship between the employee and colleagues. (Lambooij et al., 2007). For example, employees do not have to do all the work by their selves if they have co-workers. Jackson and Williams (1985) also indicated that studies in group performance have shown that people invest less effort in a variety of simple tasks when they work collectively, in comparison with when they work individually, which is called “social loafing”. As the number of co-workers increases, an employee could invest less time and energy in the task. Furthermore, when employees work with their colleagues, they will gain social approval from them. Kirmeyer and Lin (1987) also found the direct positive relationship between supportive work environment and job satisfaction. Therefore, working with co-workers can provide employees a supportive work environment which results in the increase of job satisfaction of employees.

Furthermore, working with a co-worker can also increase the work engagement of employees. Work involvement refers to employee perceptions of the concern and dedication co-workers show for their job (Billings & Moos, 1982). If there are lots of employees being asked to perform the task, employees would feel a stronger sense of involvement. Moreover, employee perceptions of work involvement have a negative

influence on role conflict and role ambiguity (Babin & Boles, 1996), which means that employees will have a clearer understanding of their role in the task if they have more co-workers. Moreover, intrinsically involved workers exhibit high job knowledge with respect to performance and behaviours which lead to reduced role stress (Weitz, Sujan & Sujan, 1986). In addition, Schachter (1959) also found that people feel less tense and nervous when performing with others than when performing on stage alone. In other words, employees feel more relaxed and comfortable when working with co-workers, which may increase their work engagement, and hence are more willing to work overtime.

In conclusion, working with co-workers leads to that they can put less effort in tasks, and leads to higher job satisfaction by providing a supportive work environment and higher work engagement by reducing their role stress. In this case, employees will feel more confident and relaxed when facing additional work tasks, both from psychological and physical reasons. I therefore predict the following:

Hypothesis1(H4): An increase in the number of people who are asked to perform the task will increase the number of over hours employees are willing to work.

2.5 The role of the degree to which people can learn from the task and the number of over hours

Learning enhances the intellectual capabilities of the employees (Watkins & Marsick, 1996). Hence, most of the employees tend to cherish possible learning opportunities at

their work since it helps them to improve their professional capabilities. Also, learning will ultimately result in a positive attitude and work commitment among individuals, which helps organizations perform better in the long run (Yeo, 2002). Moreover, being sensitive to individuals and providing them with the resources and opportunities for learning could help to achieve the greatest harmony between organizational goals and individual goals (Rowden & Conine, 2005).

Furthermore, organizations that regard learning, education, and development as a priority have seen it pay off through increased employees' job satisfaction (McNeese-Smith, 1997). Rowden and Conine (2005) examined the influence of workplace learning on job satisfaction in small commercial banks and indicated a significant relationship between workplace learning and employees' job satisfaction. Wright (1997) further more examined the effects of organizational learning and individual learning on job satisfaction and organizational commitment. The results indicated that organizational and individual learning has a big influence on job satisfaction and organizational commitment.

In conclusion, learning can not only improve employees' capabilities but also have a positive influence on their job satisfaction and work commitment. Therefore, employees are likely to be also more willing to work over hours if they receive more opportunities to learn from the task. I therefore conjecture that

Hypothesis1(H5): The Degree to which people can learn from the task will have a positive influence on the number of over hours employees are willing to work

2.6 The role of employees' contractual working hours and the number of over hours

Part-time work is primarily performed by women (OECD 1998) because most part-time workers have family responsibilities (Booth & Van Ours, 2009) and women traditionally have more responsibility for household tasks than men, even when both partners have a paid job (Blossfeld & Drobnic, 2001). In Greece, Denmark, and Finland, women make up around 66 percent of the part-time labour force. This figure is 81 percent or higher in Portugal, Great Britain, Belgium, and Austria (Tijdens, 2002). Thus, women may report more work-family conflict than men and choose a part-time job to resolve the conflict. More specifically, working overtime will be a great burden for people who experience a work-family conflict.

Whereas many women have part time employment to balance the demands from household duties, most men, however, work part time due to health problems (Gonäs & Spånt, 1997), which also may induce them to be working less overtime hours.

In conclusion, there are two main reasons could explain why part-time workers are less willing to work over hours. Firstly, for female part-time workers, they have more family responsibilities such as housework and home maintenance, which may decrease their motivation to work overtime. Secondly, for male part-time workers, they may have some health problems which would decrease their workability so they are less willing to work over hours.

However, I also expect that there is a moderating effect of working part-time on the relation between the work environment and working overtime hours.

Because part-time workers tend to have higher demand for flexible work options in order to balance family and work, or to recover from work time because of health problems, we might expect that in particular the freedom to plan the overtime hours would be more important and valuable for part-time workers. I therefore conjecture that:

Hypothesis 1 (H6): There is a stronger relationship between work environment characteristics and the number of over hours employees are willing to work for employees working in a part-time job. We therefore expect a negative moderation of contractual work hours.

2.7 The role of employees' bad health and age and the number of over hours

Finally, it is often conjectured that that aging will lead to health problems and have a negative influence on people's cognitive ability. Those health problems would further decrease the workability of employees which may lead to the decreasing of effectiveness and efficiency of work. More specifically, aging is generally associated to an earlier phasing of circadian rhythms which leads to the increasing morningness, the shortening of the normal circadian rhythm and reduced sleep duration (Monk et al. 1997, Reilly et al. 1997). Ageing has also been found to decrease the ability for circadian adjustment to night work and increase sleep disturbances (Moneta et al. 1996), which may result from a weakening of the circadian system for molecular and functional changes of the body clock, which lead to less responsive to time changes (Czeisler et al., 1992). Furthermore, sleepiness, sleep disturbances, reduced physical

fitness have a significantly negative influence on employees' workability (Rouch et al., 2005).

Moreover, evidence showed that aging will lead to cognitive decline as well (Craik & Salthouse, 2000). For example, data from a labor study strongly indicates that the disruption of circadian rhythm would trigger short-term effects on cognitive performance (Folkard, 1996).

Therefore, older employees and employees in a bad health situation need more time to recover from (overtime) work. According to Siegrist's (1996) Effort-Recovery Model, the negative consequences of long working hours for health depends on the possibilities of recovery of working day and after work. From this model we could expect a positive relationship between working overtime and need for recovery. Also, Jansen et al (2003) and Sluiter (1999) both indicated that overtime work associated with a higher need for recovery. Thus, for those employees at older age and bad health, recovery from working is more important. Hence, they are probably also less inclined to work overtime.

However, I expect also for these two variables that there is a positive moderating effect on the relation between the work environment and the number of over hours. Workers in bad health and in older age may be extra stimulated by flexible work options to work overtime, as they might be crucial for these workers to participate in overtime work anyhow. Therefore, I conjecture that:

Hypothesis1(H7): Employees' bad health will strengthen the relationship between work environment characteristics and the number of over hours employees are willing to work.

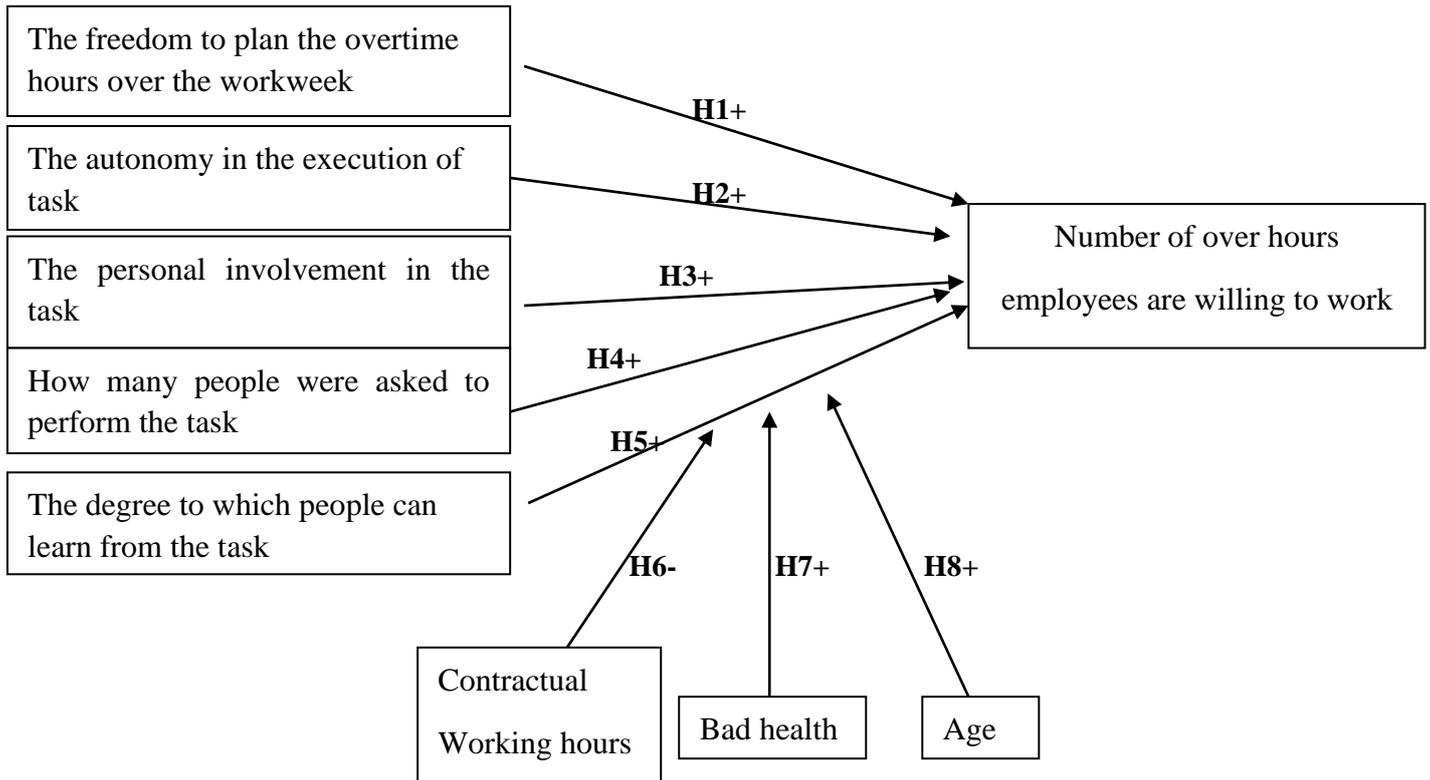
Hypothesis1(H8): Employees' age will strengthen the relationship between work environment characteristics and the number of over hours employees are willing to work.

2.8 Overview theoretical framework

Figure 1 provides a summary of the theoretical model which will act as a guideline throughout this thesis. Firstly, I expect the supportive environmental characteristics to have a positive relation with the number of over hours employees are willing to work. These environmental characteristics are the freedom to plan the overtime hours (H1), the autonomy in the execution of task (H2), the personal involvement in the task (H3), the role of peers (H4), and the degree to learn from the task (H5). Secondly, I propose a positive moderating effect on the relation between the work environments and working overtime hours. First of all, employees' contractual working hours is expected to have a negative interaction with the work environment and increase the number of over hours (H6). Furthermore, the seventh hypothesis (H7) conjectures that employees' bad health is positively moderating this basic relationship between work environment and the number of over hours. Finally, hypothesis 8 (H8) presents a

positive interaction where the number of over hours increases with the age of the employees.

Figure 1. Theoretical Framework



3. Data

3.1 Data Gathering

Data collection was conducted by the Research Centre of Education and Labor Market (ROA) in 2017. E-mails with a link to a web-based survey were sent to public sector employees from the Dutch labor market, and roughly 20.000 employees answered the survey. Since we have 6 vignette observations for each employee, we have approximately 12.0000 usable observations. The survey contains of two parts: a survey questionnaire used for conducting personal characteristics information and it includes items regarding the employee' personal characteristics (e.g., age, health condition, contractual working hours), and a stated preference experiment which makes use of vignettes. In this vignette experiment, employees were confronted with 6 different hypothetical situations in which they were asked to work 16 over hours in two weeks without compensation because of an additional job task within the organization. Conditions in which this task is preformed randomly changes over these vignettes. The conditions concern environmental characteristics (eg. freedom, autonomy, personal involvement, co-workers, and the degree to learn).

3.2 The Vignette Study

The stated preference experiment in the ROA survey consists of vignettes. Vignettes are concrete and detailed descriptions of fictive scenarios framed from practice, knowledge, and previous researches (Taylor, 2005). In this vignette experiment employees were asked to work 16 maximum over hours in two weeks without

compensation because of an additional job task. At the same time, they were also given hypothetical situations about environmental characteristics in which these characteristics randomly changed over the vignettes and were then asked to choose 6 times how many hours they are willing to work overtime to complete the task. The environmental characteristics have been carefully chosen based on effort reward models and autonomy models. Each environmental characteristic differed randomly in three levels. Below you find the different environmental characteristics and the levels on which these characteristics differ (an example of the vignette can be found in Appendix A):

Environmental characteristics:

1. The freedom to plan the overtime hours over the workweek (no freedom, limited freedom, full freedom).
2. The autonomy in the execution of task (limited autonomy, slightly limited autonomy, full autonomy).
3. The personal involvement in the task (very small involvement, limited involvement, very large involvement).
4. How many people were asked to perform the task (only yourself, you together with a small group of people, every employee).
5. The degree to which people can learn from the task (very small degree, limited degree, very large degree).

See Appendix A for an example of the vignette respondents received. Each respondent will receive the vignette six times and had to write down the answer (how many hours are they willing to work overtime) six times. The environmental characteristics were randomly assigned.

The advantage of using vignettes is that it presents hypothetical descriptions of situations while at the same time randomize the offered key characteristics. Moreover, several studies have indicated that the hypothetical behavior reported in vignette studies is strongly correlated to actual behavior (Kirwan et al., 1983; Langley et al., 1991; Peabody et al., 2000, 2004; Telser & Zweifel, 2007; Eggers, 2014). In fact, stated preference experiments may reduce or even close the gap between a survey and the real world because they reflect real decisions, while ordinary survey questions do not (Louvier, Hensher & Swait, 2000). Therefore, vignette experiments are widely used in social sciences, transportation and environmental science, marketing research (Hensher, 1997) and are also increasingly implemented in other disciplines such as economics (Barsky et al., 1997; Revelt & Train, 1998; Kantarci & Van Soest, 2008; Braga et al., 2009; Benjamin et al., 2014; Wiswall & Zafar, 2017; Elsayed et al., 2018). Furthermore, vignette experiments are very useful to study various concepts such as decision-making behavior and ageing-related topics (Telser & Zweifel, 2007; Karpinska, Henkens & Schippers, 2010). Vignette experiment is a “hybrid” of the traditional survey and experimental methods which provides high internal validity of

experiments and high external validity of survey research when examining the predictors of decision-making behavior (Telser & Zweifel, 2007).

3.3 Survey Questions

Besides the vignettes, the survey also entailed several items used to gain information about the employee’s personal characteristics such as their age, health condition, and contractual working hours. The employer’s health condition was measured by the question “How is your health in general” which they could answer by choosing from very good to very bad based on a five-point like scale. To get information about employee’s contractual working hours, they were asked the question “How many hours per week you are working according to your employment contract”.

3.4 Descriptive and Correlation

Table 1. Descriptive statistics: environmental and personal characteristics of employees

Employers characteristics	Mean	SD	Min	Max
Personal characteristics				
Age	56.7	7.6	18	67
Bad health	2.1	.7	1	5
Contract hours	33.3	6.8	0.3	60
Environmental characteristics in the vignette				
freedom	2.0	.8	1	3
Autonomy	2.0	.8	1	3
Personal involvement	2.0	.8	1	3
Number of colleagues	2.0	.8	1	3
The degree to learn	2.0	.8	1	3

Table 1 presents the descriptive information of personal and environmental characteristics of employees who responded to the survey. Importantly, to make sure the validation of the survey, we have removed the employees who are not working currently and whose contractual working hours are zero. As we can see, on average, employees in the survey are around 57 years old. Furthermore, it can be observed that the average health condition of employees is good as approximately 74% of all employees think they are in good health condition or even better. Furthermore, of all the employees' average contract working hours are 33 hours. The mean and standard deviations of the environmental characteristics of the vignette show indirectly that the randomization process was correct, in general, the data is evenly distributed over the three levels of the characteristics.

Table 2. Correlation matrix of personal characteristics and environmental characteristics

Variable name	1	2	3	4	5	6	7	8	9
1. Over hours	1.00								
2. Age	-0.047***	1.00							
3. Bad health	-0.101***	0.095**	1.00						
4. Contract hours	0.085***	-0.064**	-0.078**	1.00					
5. Freedom	0.122***	-0.001	-0.005	-0.005*	1.00				
6. Autonomy	0.061***	0.001	0.003	-0.002**	0.002*	1.00			
7. Personal involvement	0.156***	-0.000	-0.003	-0.003	0.004	-0.001	1.00		
8. Colleagues	0.028***	-0.003	-0.002	-0.006**	0.003	0.002	0.001	1.00	
9. Learning	0.113***	-0.002	-0.004	0.001	-0.001	-0.001	-0.004	0.000	1.00

Note:***p<0.01,** p<0.05 * p<.10

Table 2 presents the correlation matrix of personal characteristics, environmental characteristics and number of over hours employees are willing to work. The employee's age is negatively correlated to the number of over hours. Bad health also has a negative correlation with the number of over hours. Furthermore, I observe a positive correlation between the contractual work hours and the number of over hours. Additionally, all environmental characteristics show a positive correlation with the number of over hours. According to the correlation between characteristics, I observe age, bad health and number of colleagues correlates negatively with having a part-time job. Furthermore, I observe a positive correlation between age and bad health.

Figure 2. The number of over hour that employees are willing to work for the task

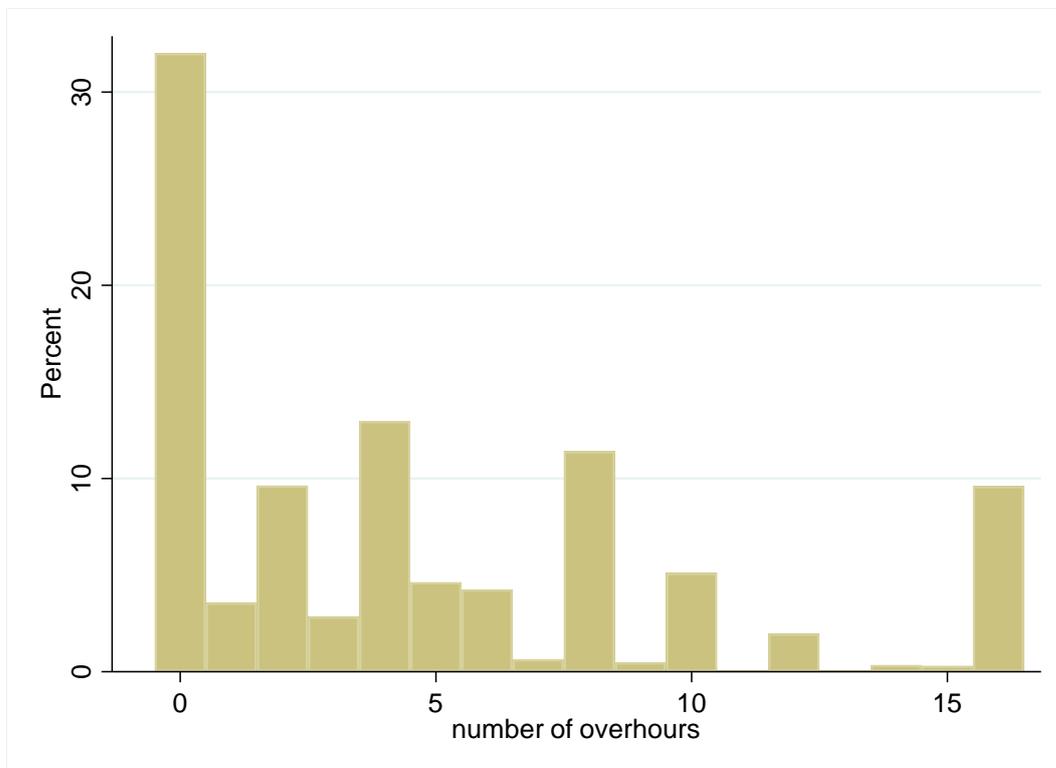


Table 3. The number of over hours

Number of over hours	Mean	Median	Min	Max
Number of colleagues	4.7	4	0	16

Figure 1 presents that the number of over hours that employees are willing to work in the experiment. It shows that over 30% of employees do not wish to work overtime when their employer asks this from them. However, around 10% of employees are willing to work 16 over hours. Furthermore, from Table 3 we can see that on average, employees are willing to work overtime for 4.7 hours.

3.5 Empirical Strategy

I want to estimate the extent to which the different environmental characteristics influence the number of over hours employees are willing to work and whether there are personal factors which moderate this relationship. First, I start by estimating an OLS regression.

$$(1) OH_{it} = \alpha + \beta_1 F_{it} + \beta_2 A_{it} + \beta_3 P_{it} + \beta_4 C_{it} + \beta_5 L_{it} + \theta X_{it} + e_{it}$$

Equation (1) estimates how the different environmental characteristics influence the number of over hours. OH_{it} stands for the number of over hours employee i is willing to work in vignette. F_{it} represents the freedom to plan the overtime hours.

A_{it} represents the autonomy in execution of the additional task during overtime hours.

P_{it} stands for the personal involvement with the additional task. C_{it} is for the number of colleagues with whom a task is performed. L_{it} is used for the degree to which people can learn from the task. Coefficient $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are expected to be positive ($\beta_1 > 0 \beta_2 > 0 \beta_3 > 0 \beta_4 > 0 \beta_5 > 0$). X_{it} includes a variable which controls for the ordering of the vignettes and e_{it} designates the error term.

As each employee has to choose six times, I provide robust variance estimates that adjust for within-cluster correlation at the individual level. The standard errors are likely not independent between different observations for each individual and this can lead to incorrect estimates without such an adjustment.

Secondly, I continue my analyses by estimating a model in which I investigate if employee's personal characteristics such as their contractual working hours (i.e., hypothesis 6), age (i.e., hypothesis 7), and health condition (i.e., hypothesis 8) influence the relationship between the environmental characteristics and the number of hours workers are willing to work

The sixth hypothesis is estimated with the following moderation equation:

$$(2) OH_{it} = \alpha + (\beta_1 F_{it} + \beta_2 A_{it} + \beta_3 P_{it} + \beta_4 C_{it} + \beta_5 L_{it}) \times Cwo_i + \theta X_{it} + e_{it}$$

Equation (2) estimates if employee's contractual working hours strengthen the relationship between the environmental characteristics and number of over hours

employees are willing to work. Cwo_i stands for employee's contractual working hours.

I expect that employee's contractual working hours could negatively moderate the relationship between environmental characteristics and number of over hours employees are willing to work.

Furthermore, for the hypothesis 7, I estimate a positive moderation effect between the environmental characteristics and employees' bad health on the over hours workers are willing to work.

$$(3) OH_{it} = \alpha + (\beta_1 F_{it} + \beta_2 A_{it} + \beta_3 P_{it} + \beta_4 C_{it} + \beta_5 L_{it}) \times BH_i + \theta X_{it} + e_{it}$$

In equation (3), BH_i stands for employee's bad health. I hypothesized that employee's bad health would strengthen the relationship between environmental characteristics and the over hours workers are willing to work.

Lastly, for the hypothesis 8, I also estimate a positive moderation effect between the environmental characteristics and the number of over hours of employees' age.

$$(4) OH_{it} = \alpha + (\beta_1 F_{it} + \beta_2 A_{it} + \beta_3 P_{it} + \beta_4 C_{it} + \beta_5 L_{it}) \times Age_i + \theta X_{it} + e_{it}$$

In equation (4), Age_i stands for employee's age. I hypothesized that employee's age would also strengthen the relationship between environmental characteristics and the number of over hours employees are willing to work.

4. Results

In this section, I first regress the environmental characteristics in the vignette on the number of over hours that employees are willing to work to show how the number of over hours people are willing to work differs substantially with the environmental characteristics. I further interact all environmental characteristics with the employee's contractual work hours, employee's age and employee's bad health respectively, in order to see how they influence the number of over hours employees are willing to work (moderation analyses). Finally, I show plots of the predicted probabilities which make it possible to have a closer look at the statistical significance of the interaction effects.

4.1 The role of environmental characteristics in predicting working over hours.

Table 4 presents the estimation results of the basic model in which I regress the environmental characteristics as described in the vignette on the number of over hours people are willing to work (Figure 3 shows this graphically). Column 1 presents the results of the OLS regression. The table shows that the number of over hours employees are willing to work differs substantially with the environmental characteristics. From table 4 we can see that all the environmental characteristics significantly increase the number of over hours. These results confirm my expectations that the number of over hours increases with supportive environmental characteristics. Specifically, compared with no freedom, very small involvement and low degree of learning, full freedom, very large involvement and high degree of

learning increases the number of over hours employees are willing to work with 1.494 hrs, 1.92 hrs and 1.391 hrs respectively. However, full autonomy and the number of colleagues working with whom the worker has to perform the task have less impact on the number of over hours, which are only 0.748hr and 0.33 hr. Freedom in when to work over time, involvement and the degree of learning seem to be therefore better policy instruments for employers to increase working over hours within their organization. However, also coefficients of the autonomy and the number of colleagues with whom a worker has to perform the task are statistically significant. These results are consistent with the hypotheses H1, H2, H3, H4, and H5, which means that work environmental characteristics, can increase the number of over hours employees are willing to work.

Table 4. Basic regression: the number of over hours employees are willing to work

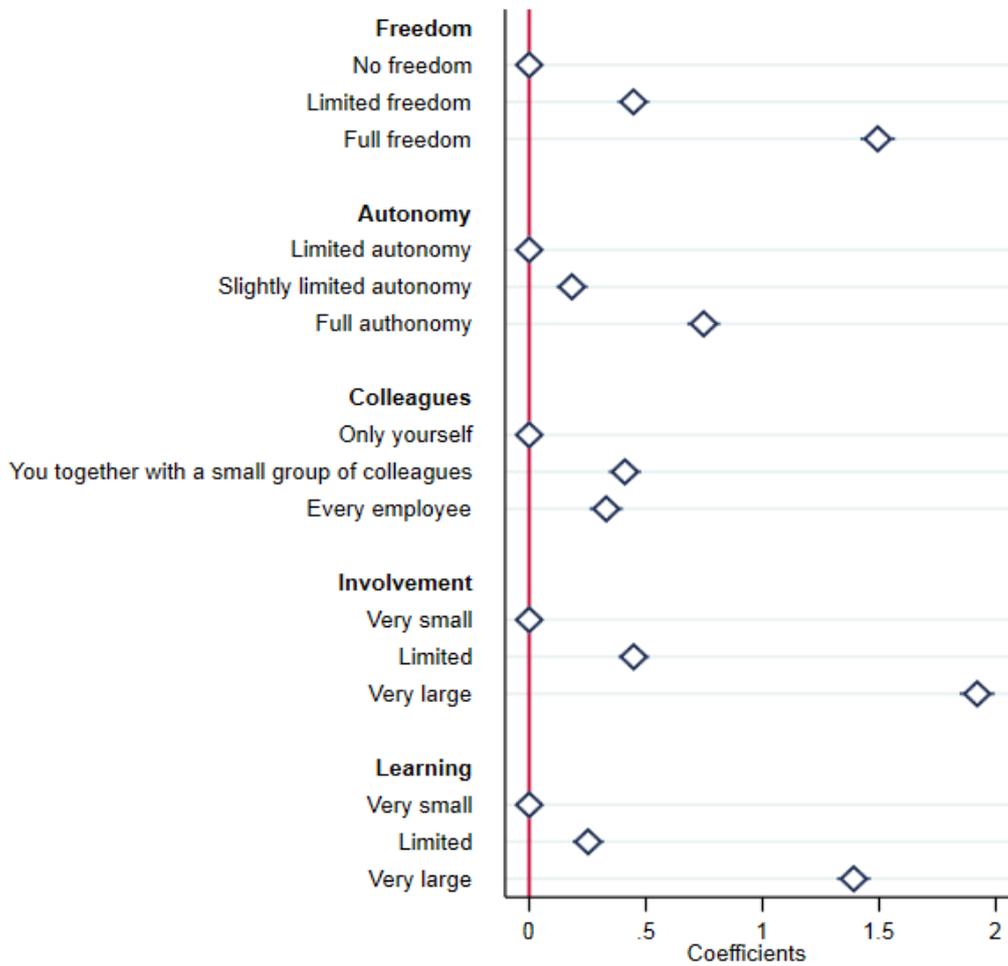
OLS regression results	(1) Overhours
Freedom when to work over time (no freedom is ref.)	
Limited freedom	0.446*** (0.035)
Full freedom	1.494*** (0.038)
Involvement in the task (very small involvement is ref.)	
Limited involvement	0.448*** (0.034)
Very large involvement	1.921*** (0.038)
Autonomy when performing the task (limited autonomy is ref.)	
Slightly limited autonomy	0.184***

	(0.034)
Full autonomy	0.749*** (0.036)
Number of colleagues with whom to perform the task (no colleague is ref.)	
Small group of colleagues	0.410*** (0.035)
Every colleague	0.330*** (0.036)
Degree of Learning in the task (a small degree of learning is ref.)	
Limited degree of learning in the task	0.251*** (0.034)
Very large degree of learning in the task	1.390*** (0.037)
Constant	2.410*** (0.053)
Observations	115,818
R-squared	0.063

OLS regression results with clustered standard errors in parentheses. The dependent variable (number of over hours employees are willing to work) and independent variables (freedom, involvement, autonomy, number of colleagues, and degree of learning) are all from the vignette.

*** p<0.01, ** p<0.05, * p<0.1

Figure 3. Basic regression: the number of over hours employees are willing to work



4.2 The role of employee’s contractual hours in predicting the number of over hours.

Table 5 shows the analyses in which I interact all environmental characteristics with the employee’s contractual work hours and see how it influences the number of over hours employees are willing to work. The results show almost no significant interaction effects, except for autonomy and contractual working hours, and very large personal involvement and contractual working hours. Specifically, the interaction

effect for slightly limited autonomy and full autonomy is found to be significant of $\beta = .012$ and $\beta = .013$ respectively. Also, the table does show a significant interaction effect ($\beta = .022$) between very large involvement and contractual working hours. However, for a proper interpretation of the significance of the interaction effects, we should also take into the account the level effects of the contractual working hours. Figure 4 and Figure 5 present, therefore, the plots of the marginal effects, which show how different contractual hour groups (e.g., 8 hrs, 16 hrs, 32 hrs, 40 hrs) interact with autonomy and involvement. This figure suggests that the number of over hours increases with the contractual hours in general. Furthermore, it can be observed that the slope becomes steeper when the autonomy and involvement is larger, in particular when workers have more contractual work hours, in line with the significant interaction effect.

The results in Table 5 thus indicate that there are two significant interaction effects, for autonomy and very large involvement, which are not consistent with the hypothesis 6 (there is a negative moderation of contractual work hours). It may be because employees who have long working hours incline to have more free time and be in better health condition to work over hours.

Table 5. Vignette characteristics interacted with employee's contractual hours.

	(1)
OLS regression results	Overhours
Freedom when to work over time (no freedom is ref)	
Limited freedom	0.705*** (0.157)
Full freedom	1.376*** (0.171)
Autonomy when performing the task (limited autonomy is ref.)	
Slightly limited autonomy	-0.229 (0.163)
Full autonomy	0.318* (0.165)
Number of Colleagues with whom to perform the task (no colleague is ref.)	
Small group of colleagues	0.171 (0.160)
Every colleague	0.276* (0.162)
Involvement in the task (very small involvement is ref.)	
Limited involvement	0.286* (0.151)
Very large involvement	1.198*** (0.169)
Degree of learning in the task (very small degree of learning is ref.)	
Limited learning	0.119 (0.159)
Very large learning	1.073*** (0.171)
Employee's contractual hours	0.038*** (0.008)
Freedom when to work overtime # employee's contractual hours	
Limited freedom #contractual hours	-0.008 (0.005)
Full freedom #contractual hours	0.004 (0.005)

Autonomy when performing the task # employee's contractual hours	
Slightly limited autonomy #contractual hours	0.012** (0.005)
Full autonomy #contractual hours	0.013*** (0.005)
Number of colleagues with whom to perform the task # employee's contractual hours	
A small group of colleagues #contractual hours	0.007 (0.005)
Every colleague #contractual hours	0.002 (0.005)
Involvement in the task # employee's contractual hours	
Very small involvement #contractual hours	0.005 (0.005)
Very large involvement #contractual hours	0.022*** (0.005)
Degree of learning in the task # employee's contractual hours	
Limited learning #contractual hours	0.004 (0.005)
Very large learning #contractual hours	0.010* (0.005)
Constant	1.150*** (0.248)
Observations	113,385
R-squared	0.071

OLS regression results with clustered standard errors in parentheses. The dependent variable (number of over hours employees are willing to work) and certain variables (freedom, autonomy, number of colleagues, involvement, and degree of learning) are all from the vignette Other variables (employee's contractual hours) are from the survey.

*** p<0.01, ** p<0.05, * p<0.1

Figure 4. Predictive probability for employee's contractual working hours and employee's autonomy

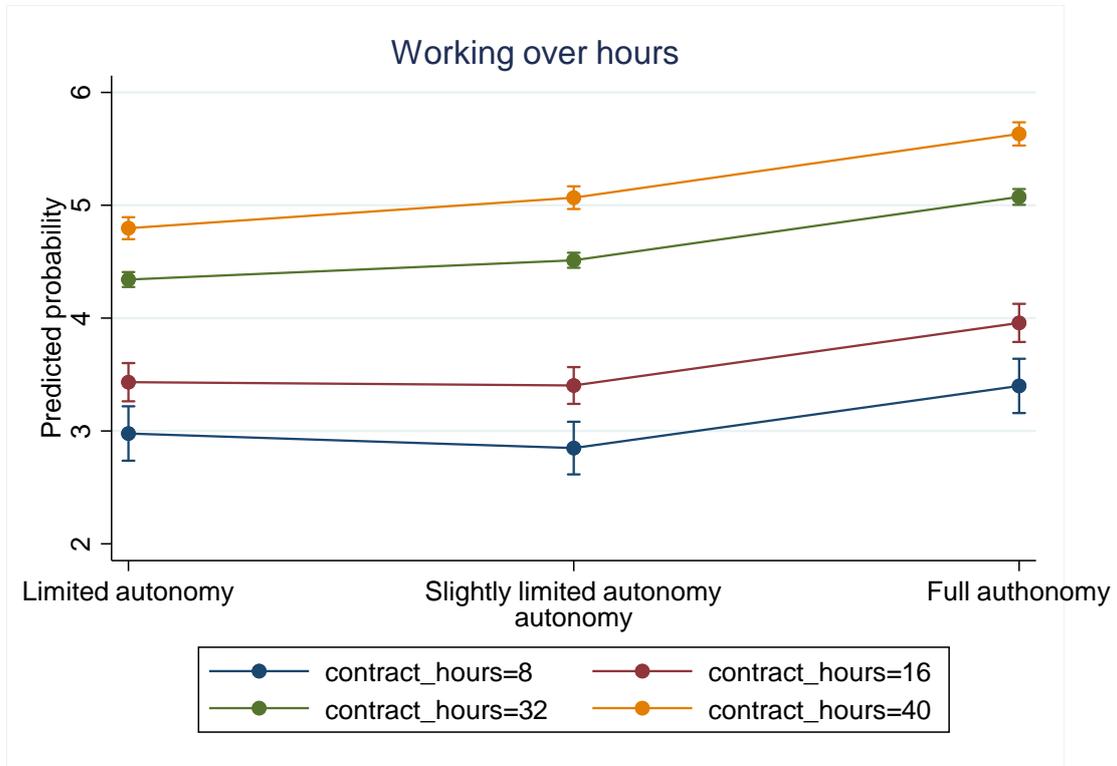


Figure 4 is a plot of the marginal effects based on Table 5, which shows how different employee's contractual hour groups interact with the autonomy when performing the task. The dependent variable is the number of over hours employees are willing to work.

Figure 5. Predictive probability for employee’s contractual working hours and employee’s involvement

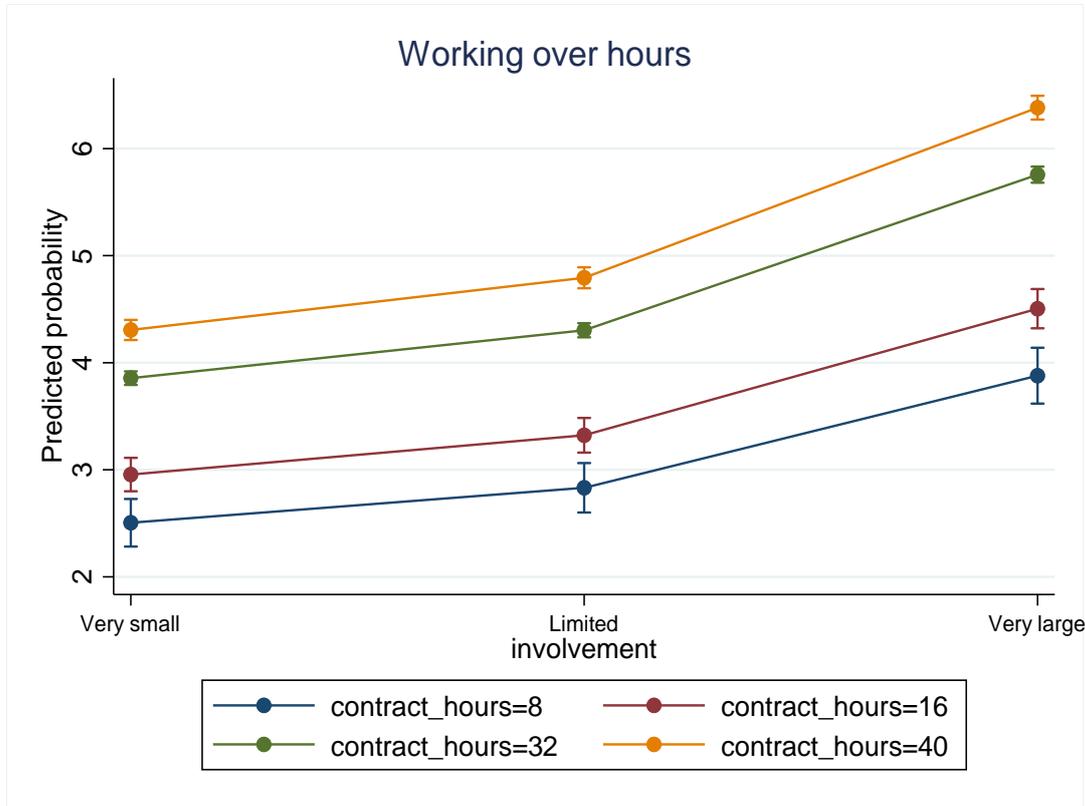


Figure 5 is a plot of the marginal effects based on Table 5, which shows how different employee’s contractual hour groups interact with the involvement in the task. The dependent variable is the number of over hours employees are willing to work.

4.3 The role of employee’s bad health in predicting working over hours.

As shown in Table 6, the seventh hypothesis is also rejected. The results show no positive moderation effect of bad health between the environmental characteristics and the number of over hours employees are willing to work. Adversely, I find a negative interaction of bad health with all environmental characteristics except the number of colleagues. Specifically, the number of over hours employees are willing to

work will decrease by 0.205 hr (freedom), 0.175 hr (autonomy), 0.291hr (involvement), and 0.309 hr (learning) respectively, decreasing the positive level effects of these variables. Only when bad health interacts with a small group of colleagues, the number of over hours will increase slightly (0.101hr), but this is only statistically significant at the 1%-level. Apparently, people in bad health are less responsive to their working environment when persuaded to work overtime. This indicates that bad health in general is a massive barrier to work overtime and changes in working environment are in general not able to alleviate this.

Table 6. Vignette characteristics interacted with employee's bad health

OLS regression results	(1) overhours
Freedom when to work over time (no freedom is ref.)	
Limited freedom	0.545*** (0.120)
Full freedom	2.036*** (0.129)
Autonomy when performing the task (limited autonomy is ref.)	
Slightly limited autonomy	0.367*** (0.117)
Full autonomy	1.198*** (0.123)
Number of colleagues with whom to perform the task (no colleagues is ref.)	
Small group of colleagues	0.192 (0.123)
Every colleague	0.316** (0.127)

Involvement in the task (very small involvement is ref.)	
Limited involvement	0.494*** (0.115)
Very large involvement	2.633*** (0.131)
Degree of learning in the task (very small degree of learning is ref.)	
Limited learning	0.408*** (0.118)
Very large learning	2.123*** (0.126)
Employee's bad health	
	-0.315*** (0.079)
Freedom when to work overtime # employee's bad health	
Limited freedom #bad health	-0.028 (0.052)
Full freedom #bad health	-0.205*** (0.056)
Autonomy when performing the task # employee's bad health	
Slightly limited autonomy #bad health	-0.078 (0.051)
Very large autonomy #bad health	-0.175*** (0.053)
Number of colleagues with whom to perform the task # employee's bad health	
A small group of colleagues #bad health	0.101* (0.054)
Every colleague #bad health	0.012 (0.055)
Involvement in the task # employee's bad health	
Limited involvement #bad health	-0.023 (0.050)
Very large involvement #bad health	-0.291*** (0.057)
Degree of learning in the task # employee's bad health	
Limited learning #bad health	-0.073 (0.052)

Very large learning #bad health	-0.309*** (0.055)
Constant	3.030*** (0.183)
Observations	92,494
R-squared	0.080

OLS regression results with clustered standard errors in parentheses. The dependent variable (number of over hours) and certain variables (freedom, autonomy, number of colleagues, involvement, and degree of learning) are all from the vignette. Other variables (employee's bad health) are from the survey.

*** p<0.01, ** p<0.05, * p<0.1

4.4 The role of employee's age in predicting working over hours.

The estimation results in Table 7 show no positive moderation effect of age between the environmental characteristics and the number of over hours employees are willing to work. Thus, older workers are not helped more by environmental characteristics to work over hours than young workers. Adversely, it can be observed that an older worker is willing to work less over hours than younger worker no matter what kind of environment is provided for him. To be specific, the interaction effect between employee's age and environmental characteristics (eg. full freedom, very large involvement and very large learning), shows that the number of over hours workers are prepared to work decreases by 0.03 hr, 0.018 hr, and 0.047 hr respectively. Then I choose to show plots of the marginal effects for all significant results in Table 7 to show this graphically (freedom, involvement, and degree of learning). Figures 5-7, depict the interaction effect between age and freedom, age and involvement, and age and learning respectively. The plot of the marginal effects shows that the number of over hours employees are willing to work is decreasing with employee's age in all three figures. In addition, when workers are provided with full freedom, very large

involvement and very large degree of learning in the task, we observe that workers aged 65 work around 2 hours less in overtime compared to workers aged 30. In Figure 5, we can observe that compared with full freedom, the slope of no freedom and limited freedom are flatter which means that the extent of freedom becomes less effective for older workers. Similar findings can be observed in Figure 6 and Figure 7 as well. And the fact that the lines become closer is due to the interaction effect. We see that the convergence in particular happens due to the stronger negative slope for full freedom, very large involvement and a very large degree of learning in the task. Important, however, is to remark that the interaction effect does not fully compensate the level effect of these three variables.

In a word, nearly all the moderation effects of age between environmental characteristics and the number of over hours employees are willing to work are negative; I therefore reject the eighth hypothesis. The results suggest that as aging of employees progresses, the environment provided for them becomes less effective in maintaining or increasing their over hours.

Table 7. Vignette characteristics interacted with employee’s age

OLS regression results	(1) Overhours
Freedom when to work over time (no freedom is ref.)	
Limited freedom	1.048*** (0.287)
Full freedom	3.301*** (0.303)
Autonomy when performing the task (limited autonomy is ref.)	

Slightly limited autonomy	0.136 (0.276)
Full autonomy	1.065*** (0.290)
Number of colleagues with whom to perform the task (no colleague is ref.)	
A small group of colleagues	0.641** (0.281)
Every colleague	0.170 (0.289)
Involvement in the task (very small involvement is ref.)	
Limited involvement	0.147 (0.270)
Very large involvement	3.054*** (0.314)
Degree of learning in the task (very small degree of learning is ref.)	
Limited learning	0.511* (0.274)
Very large learning	4.139*** (0.298)
Employee's age	0.016** (0.007)
Freedom when to perform the task # employee's age	
Limited freedom #age	-0.010** (0.005)
Full freedom #age	-0.030*** (0.005)
Autonomy when performing the task # employee's age	
Slightly limited autonomy #age	0.001 (0.005)
Full autonomy #age	-0.004 (0.005)
Number of colleagues with whom to perform the task # employee's age	
A small group of colleagues #age	-0.004 (0.005)
Every colleague #age	0.003 (0.005)
Involvement in the task # employee's age	
Limited involvement #age	0.005 (0.005)
Very large involvement #age	-0.018***

	(0.005)
Degree of learning in the task # employee's age	
Limited learning #age	-0.005 (0.005)
Very large learning #age	-0.047*** (0.005)
Constant	1.441*** (0.422)
Observations	94,198
R-squared	0.073

OLS regression results with clustered standard errors in parentheses. The dependent variable (number of over hours) and certain variables (freedom, autonomy, number of colleagues, involvement, and degree of learning) are all from the vignette and other variable (employee's age) is from the survey.

*** p<0.01, ** p<0.05, * p<0.1

Figure 6. Predictive probability for employee's freedom and employee's age

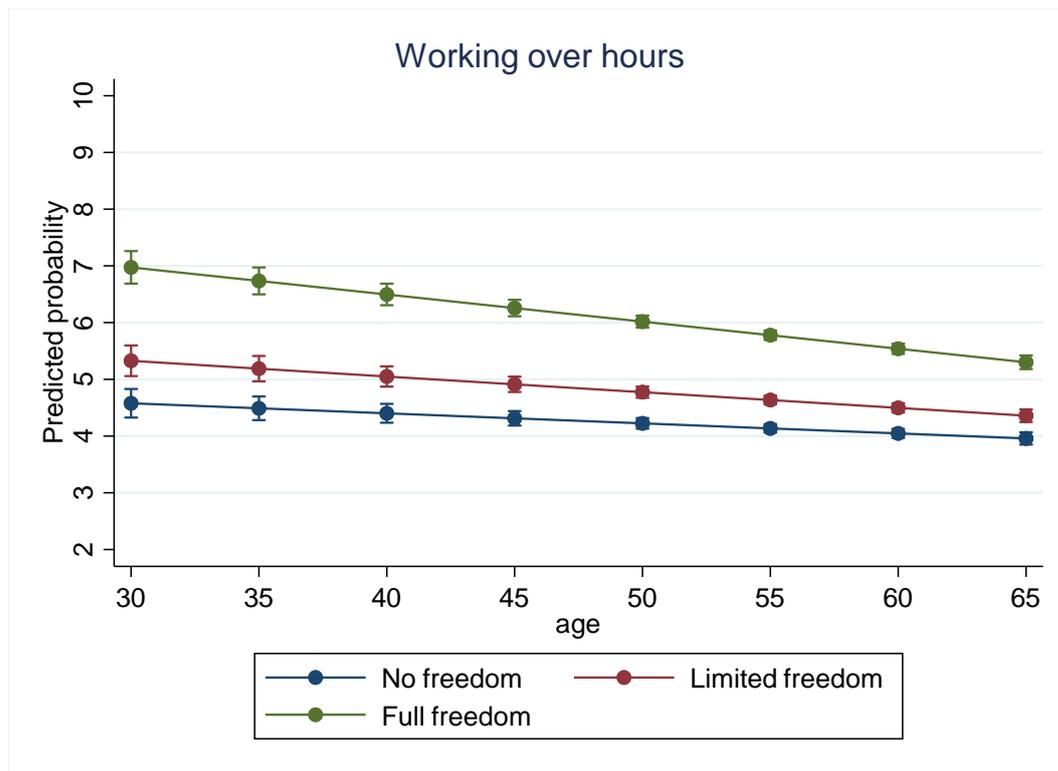


Figure 6 is a plot of the marginal effects based on Table 7, which shows how different extent freedom interacts with employee's age. The dependent variable is number of over hours employees are willing to work.

Figure 7. Predictive probability for employee's involvement and employee's age

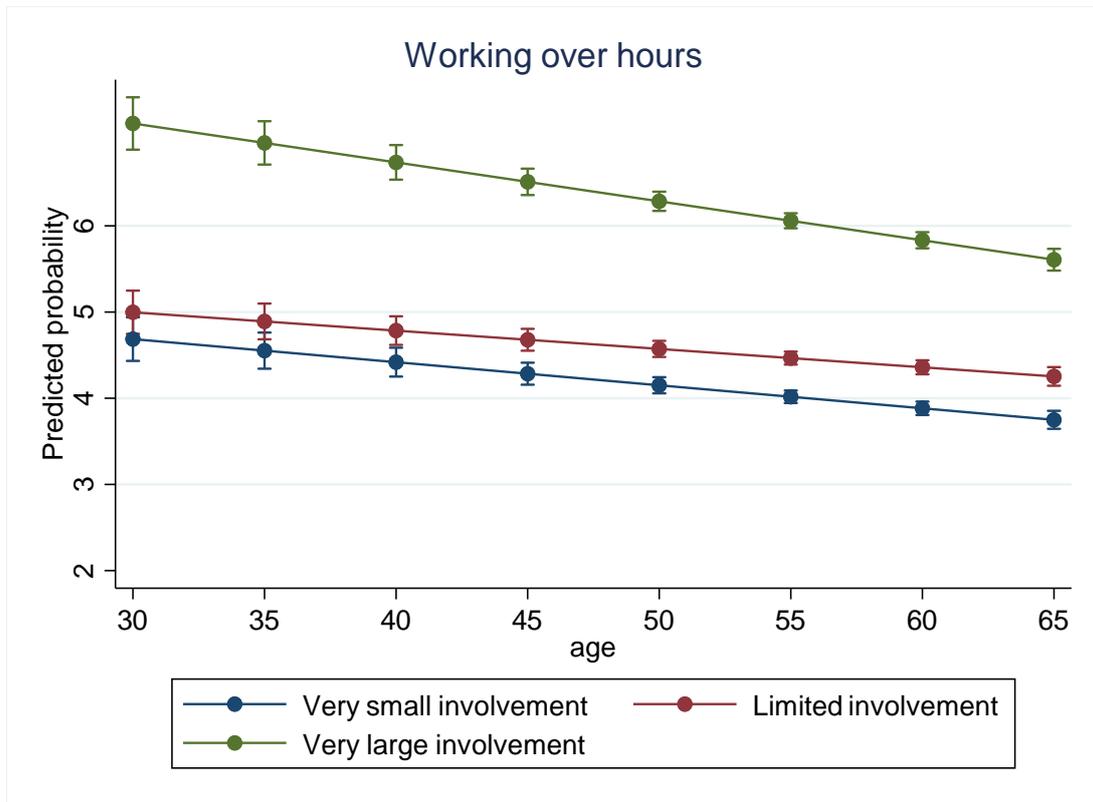


Figure 7 is a plot of the marginal effects based on Table 7, which shows how different extent involvement interacts with employee's age. The dependent variable is number of over hours employees are willing to work.

Figure 8. Predictive probability for employee's learning and employee's age

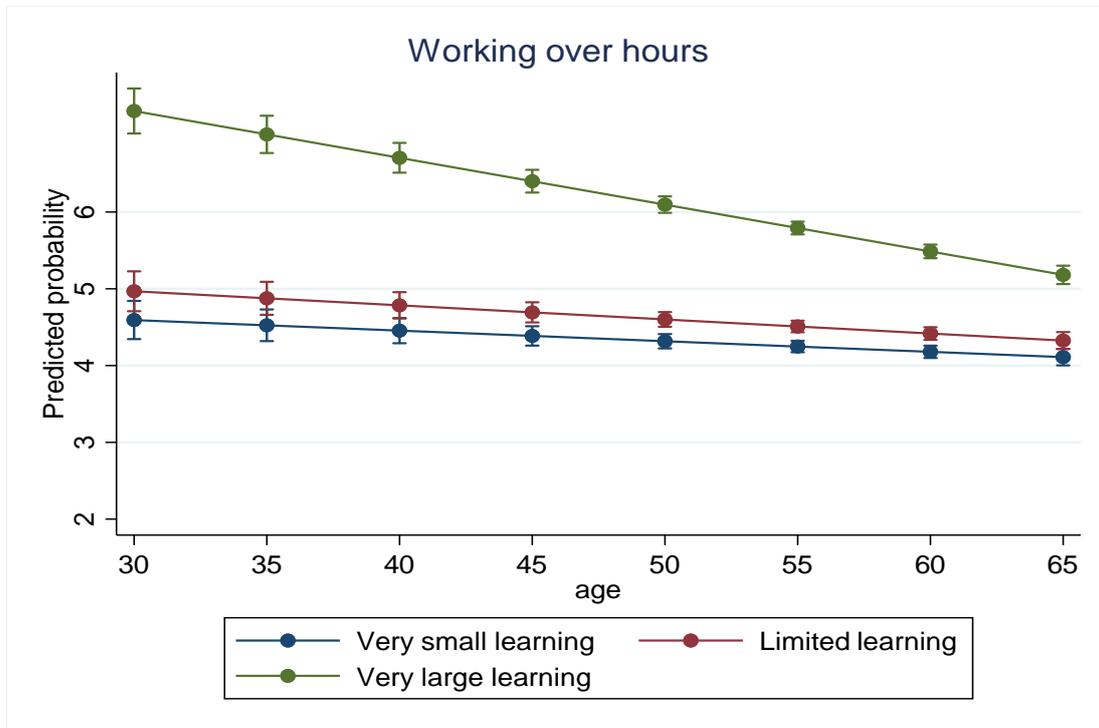


Figure 8 is a plot of the marginal effects based on Table 7, which shows how different degree of learning interacts with employee's age. The dependent variable is number of over hours employees are willing to work.

5. Discussion & Conclusion

5.1 Discussion

This study builds upon a stated preference experiment (vignettes experiment) and a survey questionnaire that is conducted to analyze the effect of environmental characteristics on the number of over hours employees are willing to work and the interaction effect of employee' personal characteristics between environmental characteristics and the number of over hours employees are willing to work.

First, the hypotheses H1, H2, H3, H4, and H5 are confirmed which means that work environmental characteristics, can increase the number of over hours employees are willing to work. The results also suggest that the higher the degree of freedom, autonomy, personal involvement, and learning in the job tasks that employee have, the higher the number of over hours employees are willing to work is, indicating that these supportive environmental characteristics are strong predictors for the number of over hours employees are willing to work.

Second, I find there are some positive interaction effects of contractual work hours on the number of over hours employees are willing to work, which is not consistent with the hypothesis 6. In addition, my results suggest that the number of over hours increases with the contractual hours in general. It may be because employees who have long working hours (eg. full-time job or have multiple part-time jobs at the same time) tend to suffer less from family-job conflict and health problems. For instance, many women choose to have part time employment (short working hours) to

balance the demands from household duties, which may decrease their motivation to work over hours. Men might work part time due to health problems which could decrease their capability to work over hours (Gonäs & Spånt, 1997). Thus, employees who have longer contractual working hours tend to have better condition (eg. health condition, family condition) to work over hours.

Finally, I find that the interaction effects of employee's personal characteristics (bad health and age) with full freedom, very large involvement and very large degree of learning on the number of over hours employees are willing to work are nearly always negative which means that I have to reject hypotheses 7 and 8. Specifically, it indicates that employees who are at bad health condition and at older age have much less number of over hours to work anyway no matter what kind of supportive environment provided for them, which means work environment can't increase their number of over hours. It may be because older employees and employees in a bad health situation need more time to recover from (overtime) work. Also, Jansen et al (2003) and Sluiter (1999) both indicated that overtime work associated with a higher need for recovery. It may be because overtime work could disturb physiological processes and increase psychological stress which becomes a great burden for employees. Thus, for those employees at older age and in bad health, they are probably less inclined to work overtime. Furthermore, my results also suggest that the number of over hours decreases with employee's age in general. The possible reasons could be older workers suffer more from health problems which decreases their workability.

Therefore, older workers report less number of over hours they are willing to work in general.

5.2 Conclusion

The purpose of this thesis was to examine the relationship between work environmental characteristics and the number of over hours employees are willing to work. I also tested if employees' personal characteristics could influence this relationship. For this reason, I made use of data from a vignette study and a survey questionnaire conducted by the Research Centre of Education and the Labor Market (ROA) in 2017. Although organizations have greater interest in motivating their employees to work overtime as the increasing shortage on the labour market and over time work becomes a common phenomenon in today's industrialized countries (Kodz et al., 2003), not much is known about the factors that influence employees' decisions to work over hours. My thesis shows that work environment characteristics could positively influence the number of over hours employees are willing to work.

Therefore, organizations should consider giving employees full freedom, large autonomy, large learning opportunities and large personal involvement when they prompt employees to work over time, especially very large involvement and full freedom. To achieve such consideration, it is important to make employees aware that organizations will provide them extra favorable terms if they work over time which could increase their motivation to work over hours. Also, with the results of this thesis in mind, policy makers should diverge in their requests for working overtime between

age groups. Older employees are less responsive to favorable working conditions to increase their number of over hours.

5.3 Limitations

In spite of the advantages of the analyses, such as large sample size and the robustness of the results, this thesis still has its limitations. First, the employees who completed the survey were all from the public sector which decreases the external validity as it can't generalize the results to all sectors of employment in the Netherlands. Therefore, for future research it would be interesting to also include employees from the private sector to see if this has an effect on the number of over hours employees are willing to work. Second, even though vignette studies are created to mimic real world decisions and the survey questionnaires include personal information about the employee, it is still not possible to identify the exact reason behind the decisions of employees. This thesis only touched upon a few variables that may influence the decision-making behavior of employees. Therefore, it would be better for future studies to focus on creating new vignette experiments which include new variables such as work burden. Also, by creating new questionnaires, future studies should give more insight into the personal factors of employees when they decide to work over hours. Lastly, the part-time job status may be flawed. It could be that employees have multiple part-time jobs at the same time and the accumulation of contractual working hours could be very long in this case.

Appendix A (example of a vignette)

Imagine that your job requires a task to be performed unexpectedly that requires additional work. Your employer asks you and any colleagues all to work a number of overtime hours (maximum 16 hours) in two weeks. Your employer cannot give you financial compensation for this. Your employer hereby declares that you understand if you do not want to work any more or less overtime and leave the choice entirely to yourself. The circumstances in which you must perform the task differ according to five characteristics:

1. Your freedom to organize overtime;
2. The autonomy in performing the task;
3. Number of colleagues who have been asked to work overtime;
4. Your personal involvement in the task;
5. and the extent to which you can learn something from the task.

You will then be asked to choose 6 times how many hours of your own time you are willing to work overtime to complete the task. People got 6 times the question below in which the fields belonging to the circumstances were randomized.

The circumstances in which overtime must be characterized are:

Freedom to organize overtime:

{ limited freedom }

Autonomy in performing the task: {full autonomy}

Number of colleagues who were asked to work overtime: {only yourself}

Your personal involvement in the task: {very large}

The extent to which you can learn something from the task: {very small}

How many hours of your own time are you willing to work overtime?

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