

**Making Money at a (Health) Cost? –
The Effect of Working Hours on General and Mental Health**



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Bachelor Thesis International Bachelor Economics and Business Economics

Erasmus School of Economics

Health Economics

Date Final Version: 13.08.2018

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Table of Contents

I.	Summary	2
II.	Introduction	3
III.	Related Literature	5
	A. Theory on Part-Time Employment..	5
	B. Empirical Evidence	7
	C. Part-Time Work in the Dutch Labor Market	10
IV.	Data	11
V.	Methodology	19
VI.	Results	22
	A. General Health	22
	B. Mental Health.....	27
	C. General and Mental Health of Blue-Collar and White-Collar Workers	33
VII.	Discussion and Conclusion	37
VIII.	References	44
IX.	Appendix A – Additional Data	46
X.	Appendix B – Additional Results	52

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I. Summary

The effect of the working hours on different measures of the health of an individual has not yet been explored by reputable academic literature. Nevertheless, it is highly relevant in each country to ensure a healthy workforce and protect the workers from negative health outcomes. With a high fraction of the Dutch workers, especially women, being employed in part-time jobs (OECD, 2018), it is of interest to research if this working pattern also increases the health of individuals residing in the Netherlands.

In this paper, by using individual fixed-effects regressions on the Dutch Longitudinal Internet Studies for the Social sciences (LISS) household panel, four models, varying in their control variables, were generated. These models estimated the effect of the continuous variable working hours on two self-reported measures of general health and five self-reported measures of the mental health of individuals, while allowing for non-linearity. Furthermore, the models included relevant control variables, e.g. year dummies, a lag of the health in the previous year, education levels and working sectors. In addition, cross-partner effects of the health and working hours were investigated. Also, it has been investigated if the effect of the working hours on the mental health of individuals differs for white-collar and blue-collar sectors.

While the results of the paper show no significant effect of the amount of chosen working hours on the general or mental health of a person in the Netherlands, a positive effect of the working hours of men on their mental health has been obtained. The mental health was shown to be affected through lower levels of anxiety resulting from increasing working hours. For women, this effect was not displayed as significant. Other findings include cross-partner effects for health. The mental and general health of a Dutch individual has been concluded to be strongly positively influenced by the general health of the partner.

It has been concluded that Dutch individuals are unlikely to decide to perform part-time work as a consequence of trying to avoid negative health outcomes due to a large amount of working hours.

II. Introduction

Amongst the member states of the organization for economic co-operation and development (OECD), the average weekly working hours have strongly decreased over the past 16 years. While in 2000 the average employee used to work 37.4 weekly hours in the labor market, in 2016 36.6 weekly hours were the market average. Similar trends have been observed in the Netherlands, where the average decreased from 30.6 hours of market work per week in 2000 to 29.2 hours in 2016 (OECD, 2018). In the Netherlands, the concept of part-time work has become increasingly popular amongst female and male workers during the last years. The Netherlands is the leading country within the OECD regarding the percentage of employed people working part-time (OECD, 2018). In 2013, 35.9% of all Dutch workers were employed part-time, while in 2016, 37.7% of all employed citizens worked part-time (OECD, 2018). These recent trends raise the question, which non-monetary benefits the concept of part-time work offers, in comparison to other available working patterns including e.g. full-time work or unemployment. One of the less researched, but highly relevant areas, is, how the general and mental health of a working individual is affected by the working pattern, and thereby the number of working hours, that he or she opts for. To closer investigate this correlation, this paper aims to answer the following research question:

To what extent does the quantity of working hours influence the general and mental health of individuals in the Netherlands?

With this research question, the paper aims to estimate the true effect of changes in the number of working hours on multiple measures of an individual's health by using an individual fixed-effects regression and adding time-variant control variables. In addition, other factors which are likely to be influencing the general and metal health will be proposed and investigated. Moreover, the paper suggests further (policy) implications of the research and analyzes possible shortcomings. Furthermore, with the help of existing related literature, possible explanations for the different effect of the working hours for male and female workers on the outcome variables will be discussed.

Previously, the mechanisms through which the working hours could possibly influence the general and mental health, have been researched. One study by Lallukka et al. (2008) investigated if working overtime and the activity level and strain at work influence behaviors such as heavy drinking, an unhealthy nutrition, obesity, smoking and the quantity of physical activity. For

Japanese men they found that high job strain was correlated with an increase in the quantity of smoking and a higher likelihood of being a former smoker. English men with a job which was related to a passive activity level had a higher probability of having an unhealthy nutrition, while for English women working overtime also increased the likelihood of suffering from obesity (Lallukka et al., 2008). If multiple of these mechanisms are accumulating, it can be expected that there is a correlation between the working hours of an individual and their general and mental health. Furthermore, the study suggests that the significance of the mechanisms can vary widely amongst different countries and cultures. Therefore, these mechanisms and their health outcomes should be analyzed separately for each country.

Compared to other previous studies which researched working patterns, such as “small part-time jobs” or “full-time jobs”, and their effect on satisfaction, this study follows a different methodological approach. Instead of regressing these working patterns on satisfaction, or in this specific case on health outcomes, working hours are used as the independent variable in the regression model. This allows drawing more exact conclusions by splitting the sample further into female and male workers, as well as into different occupations, instead of only investigating the working pattern such as part-time due to the low quantity of remaining data. While using an individual fixed-effects regression, less observations of time-invariant work patterns will be deleted. Even when the working hours vary, the category of the working pattern might not change over time. In an individual fixed-effects model which would regress the health outcomes on various categories of working patterns, time-invariant observations would be deleted, while with the continuous independent variable of working hours, these changes will be captured. Furthermore, the working patterns are usually defined quite broad, e.g. “small part-time jobs” range from 1-15 working hours per week (Booth & Van Ours, 2008). In addition, self-reported data is used for the working hours of the individuals instead of the hours which are mentioned in the contract or other documents. This results in a strong advantage, since the true overtime or undertime working hours are more likely to be captured. Furthermore, this paper is, to my knowledge, amongst the first ones to measure the effect of the weekly working hours on the general and mental health of individuals. Other previous literature is mainly concerned with the effect of shift work or the organizational climate on the health of workers (Spurgeon, Harrington & Cooper, 1997). Still, researching the effect of the working hours on health outcomes is of relevance for the

governmental sector aiming to impose regulations, as well as for companies and their workers who are able to alter their decisions for the average working hours they request or perform.

This study found no general significant effect of the working hours of Dutch individuals on their measures of general or mental health. Nevertheless, for men, a higher quantity of working hours has been shown to significantly lead to a lower frequency of feeling anxious, and, therefore, to an improved mental health. For women, this effect has not been found. Next to the findings on the working hours, the paper investigated if the health of the partner also impacts the health of an individual. Strong cross-partner effects of health have been found for the general health and mental health of individuals, indicating, that the health of individuals is positively correlated to the health of their partner.

The outline of the paper will be as follows: In section III. A., an overview of the theoretical literature, which is explaining the existence of part-time employment and the reasons of workers to opt for it, will be provided. Following, part B. will provide the reader with insights into existing empirical evidence on the relation of part-time and full-time working patterns with multiple types of satisfaction (e.g. life satisfaction, working hours satisfaction and work satisfaction) and the mechanisms which might lead to a correlation between working hours and an individual's general and mental health. In part C., further information on part-time work in the Dutch labor market will be provided. Then, in section IV., the Dutch Household Data and descriptive statistics will be shown, which are being followed by the description of the Methodology in section V. Later, the results will be presented in section VI. and further discussed in section VII., where also the overall conclusion will be drawn.

III. Related Literature

A. Theory on Part-Time Employment

To understand how individuals choose their working hours in the household or market, one can draw back on Becker's' (1965) theory on the "Allocation of Time". Individuals who are living with a partner can be expected to close to fully specialize in either household work or market work under the condition that the production functions of the working individual exhibit linearity. If this is not the case and the production functions are showcasing diminishing marginal returns, an individual might not fully specialize in one area of work, but instead opt for a combination of market and household work, e.g. part-time work. According to the author, the diminishing

marginal returns can be reasoned with e.g. boredom arising from performing the same activity repetitively or exhaustion arising from the work. Another plausible explanation is that an investment in the skills set required for the market work might lead to a cost decrease for the investment in household skills (Booth & Van Ours, 2009).

Akerlof and Kranton (2000) extended these findings with the model of the identity of the household. The authors argue that individuals alter their decision of how many hours of work labor, home labor and leisure they engage in subject to the norms of society. According to Akerlof and Kranton (2000), female and male partners are both confronted with different ideals of how to behave and which type of work, e.g. house work, child care or market work, supports their female or male identity. If these identity patterns are present in a country, not following the norms can put an individual under pressure and cause anxiety, dissatisfaction and thereby eventually also result in decreases in the health of an individual, under the condition that the decision of the allocation of working hours is not altered. These findings do imply that there are two goals an individual wants to achieve: Satisfaction from working in the market and fulfilling their own gender identity (Akerlof & Kranton, 2000). The presence of the so-called “gender identity” by Akerlof and Kranton (2000) is reasoning the existence of part-time employment. Part-time workers are now able to perform the role which is assigned to their gender, e.g. taking care of children or cleaning the home, as well as gaining purpose, self-confidence and income from performing work in the market. The other partner might alter their labor supply to the market, depending on the elasticity of his or her labor supply. In the second part of the related literature, it will be further investigated, based on empirical findings, whether the additional income, which is obtained through the second individual in a household entering the market labor force, influences the first individuals’ hours of work. Nevertheless, the theory assumes that the individuals making their employment choices are fully informed about their utility relating to each quantity of working hours and that they always manage to optimize their satisfaction payoff (Akerlof & Kranton, 2000). One also must notice, that the maximum satisfaction is not necessarily also corresponding with the point that maximizes the health of an individual. Yet, taking the theory of gender identity into account, it becomes clear that different ideal points of working hours quantity which are optimizing the general and mental health of an individual and therefore different coefficients corresponding to the quantity of working hours, can be expected per gender. The same can be expected for different professions which are either more or less fulfilling the gender identity of an individual, leading to either lower

or higher levels of general and mental health and therefore to a stronger or weaker effect of working hours on the general and mental health, respectively. Consequently, in this paper, the impact of the quantity of working hours on multiple determinants of an individual's general and mental health will be further investigated per gender and profession.

B. Empirical Evidence

Much literature has been published on how the different working patterns (e.g. part-time and full-time) affect the life satisfaction, working hour satisfaction and general work satisfaction of individuals and their partners. These findings are of importance for this research concerning the general and mental health, since the well-being of an individual can be expected to be highly correlated with their mental and also their general health. Therefore, generally speaking, health could be an instrument through which the working pattern of an individual affects its satisfaction on multiple levels.

Booth and Van Ours (2008) were investigating the effect of working patterns on the previously mentioned measures of satisfaction in British Households between 1996 and 2003. The authors were using four distinct categories of working patterns, namely “small part-time jobs”, “large part-time jobs”, “full-time jobs” and “overtime jobs”. The lowest category corresponds to 1-15 hours of work per week, the second one for weekly work between 16 to 29 hours, and full-time jobs are considered to be jobs with 30-40 weekly working hours. The category “overtime jobs” was assigned to jobs with an average of above 40 working hours per week (Booth & Van Ours, 2008).

The results regarding the satisfaction with the working hours of both women and men, which are stated as panel estimates, are of interest. For women, the working pattern does partly, depending on their work hours category, significantly influence their working hour satisfaction. While working in large part-time jobs compared to small part-time jobs does not significantly change the women's working hour satisfaction at the 10% level, women are on average expecting a significant decrease of their working hour satisfaction if they are working in full-time jobs instead of small part-time jobs. The decrease they experience if they are working overtime is even bigger. For men, working more than 40 weekly hours compared to 1-15 hours leads to a significant decrease of their working hours satisfaction. The control variable of family income is significantly negatively correlated with the working hour satisfaction for male workers, while this effect appears

to be existing but smaller and not significant at the 10% level for women (Booth & Van Ours, 2008). Booth and Van Ours (2008) state, the better women and men rate their own health, the higher they also report their working hour satisfaction. Furthermore, the health or working hours of their partner does not significantly affect both genders' working hour satisfaction.

Comparable results can be found for the effect of working patterns on the job satisfaction of British female workers. The more a category of working hours differs from a small part-time job, the more dissatisfied female workers become with their work, on average. Only the difference between a small part-time job and a large part-time job is not significantly affecting the work satisfaction. While their own health has a strong positive effect on their work satisfaction, the effect of their partners health is not significant. For male workers, only their own health has a significant positive effect on their job satisfaction, while there is no significant impact of their working hours on their job satisfaction.

In addition, the authors investigated the effect of the working hours on the life satisfaction of individuals with a partner. While for women without children only their own health has been found to significantly increase their own satisfaction, and for males only the family income and own health significantly increases their health, the results are deviating a lot if a couple has children. For women with children, the family income and own health increases their satisfaction. Furthermore, having children aged 3-4 decreases their life satisfaction while children aged 5-15 increase their levels of satisfaction. Also, working 30-40 hours significantly improves a woman's life satisfaction compared to working 1-15 hours per week. If their partner is working overtime, the life satisfaction of females with children is further increased. For males with children, their life satisfaction increases with their own health and family income and significantly decreases if they have young children under the age of 4. Working full-time or overtime also increases the male's life satisfaction compared to working in a small part-time job (Booth & Van Ours, 2008).

Nevertheless, the same pattern in life satisfaction is not observable for Australian couples, which also have been researched by Booth & Van Ours (2009). In Australia, the life satisfaction of women is significantly increasing if their partner is either working 31-40 or 40-50 hours per week, while the increase if the partner is working above 50 hours is only slightly smaller. For men, only having their own weekly working hours between 35-40 or 41-50 hours per week leads to a significant increase in life satisfaction (Booth & Van Ours, 2009). Comparing the results with the British ones, it can be concluded that there are more cross-partner effects for Australian couples

than for British couples (Booth & Van Ours, 2008; Booth & Van Ours, 2009), which furthermore suggests that the behavior patterns vary greatly across cultures.

The authors describe the results for female British workers as a “puzzle”, since female workers without children gain job satisfaction if they work part-time, while there is no effect of this change on life satisfaction. If they have children, female workers prefer working part-time if they aim to optimize their job satisfaction and full-time if they aim to maximize their life satisfaction (Booth & Van Ours, 2008).

One shortcoming of the available empirical literature is that the category which other quantities of working hours are compared to, is the category of small part-time jobs, which includes work from 1-15 hours a week. Therefore, the previous papers solely include individuals who are working in the market in their data. Since many women also opt for the possibility of staying at home, it is also desirable to research how the absence of work does affect their life satisfaction or general and mental health.

Also, so far, a variable of health has usually just been investigated as a control variable in regressions of individual job satisfaction or individual working hours satisfaction on working patterns. Nevertheless, as mentioned previously, the findings on different types of satisfaction can provide us with an indicator when working individuals are probably also experiencing a high likelihood of high mental and general health. Nevertheless, the exact relationship has, to my best knowledge, not been investigated before. Therefore, this paper aims to close the gap in the research, by directly researching the effect of the working hours of an individual on the individual general and mental health.

While close to no reputable previous literature, to my knowledge, investigated the effect of the working hours on the general and mental health of an individual, there have been publications on the working patterns and their effect on the mechanisms which might lead to decreasing health. Lallukka et al. (2008) researched the various mechanisms affecting the health of a working individual which are resulting from overtime work, the activity level and the strain related to their work. The authors were investigating the behavior of Japanese, British and Finnish civil service department workers and city employees with a postal questionnaire and a medical screening. Amongst Japanese men, a high job strain was correlated with an increasing amount of smoking and also with a higher likelihood of being an ex-smoker. Male English workers were found to engage in unhealthy eating behaviors if they have a job with a lower activity level. In

none of the three countries working overtime showed a correlation with being a heavy drinker. A correlation between working overtime and being obese has only been found amongst English women, where the females working overtime had a significantly higher risk of being obese (Lallukka et al., 2008). Nevertheless, the study also has several shortcomings, such as working overtime being a binary variable only, which results in a less accurate analysis of the effect of working hours on these mechanisms influencing the health of workers. These results also show that it is necessary to investigate the effect of working hours on the health of workers separately for each country, since the correlations vary significantly across countries and do not have a strong external validity.

C. Part-Time Work in the Dutch Labor Market

With 37.7% of all employed Dutch working in a part-time contract, the Netherlands is the country with the highest part-time employment rate in the European Union and among the Organisation for Economic Co-operation and Development (OECD) countries, as measured in the year 2016. Furthermore, the OECD average of part-time employment is significantly lower with 16.7% of all workers having a part-time job. Also, the patterns of which individuals are working part-time differ significantly (OECD, 2018). While in the whole OECD on average 68.8% of part-time workers are female, in the Netherlands 73.3% of the workers in part-time employment are women, which means that there are significantly more women practicing part-time work. While in the OECD, 25.8% of all women are employed part-time, in the Netherlands 59.8% of all working women are having a part-time job (OECD, 2018). But also for the males, part-time work seems to be more attractive to the Dutch workers compared to other male workers in the OECD. While 9.4% of male workers in the OECD are part-time employees, 18.7% of men are working in part-time jobs (OECD, 2018).

Also, in the Netherlands, Booth and Van Ours (2013) follow a similar methodology as previously outlined in section III.B. to research in which job patterns male and female workers in the Netherlands receive the highest satisfaction measures. For male Dutch workers, working either in a large part-time job or a full-time job yields the highest life satisfaction. If the model does not further control for the family income, then the male worker prefers his partner to work in a part-time job. When controlling for the family income, this value is no longer significant. Female Dutch workers life satisfaction do not seem to be affected by their own or their partners working pattern,

unless the household income enters as a control variable. Then, working above 40 hours per week, results in a lower life satisfaction compared to lower working hours. By asking for the satisfaction of an individual with his current working hours, the authors derived that women would ideally prefer to work 21 hours per week, while the equilibrium weekly working hours for men lies at 32. Additionally, the authors were able to show that women are facing a gender bias in the Netherlands. If a Dutch woman increases her share of market work in the household, the male partner, on average, does not increase his share of household work. Therefore, the female share of household work does not decrease proportionally to her increase in market work. This means, that women who are providing more market work, tend to provide more work in total, which is the sum of their market and household work.

IV. Data

The data for this study has been obtained from the Longitudinal Internet Studies for the Social Sciences (LISS) panel, which's data has been collected and administrated by the CentERdata (Tilburg University, The Netherlands) institute. It consists of panel data of approximately 7.000 individuals which are divided across 4.500 households in the Netherlands. The surveyed households are a random sample from the Dutch population register and therefore reliably representing the Dutch population (CentERdata, 2018).

The data set has been constructed by merging a set of background variables with two different core studies within the LISS panel, namely the Health Panel and the Work and Schooling Panel. This procedure has been followed for multiple years. In the end, the yearly merged data sets have been appended to one data set. The panel data, which was used in this paper, covers the years 2012, 2013, 2015, 2016 and 2017. Observations of the health variables of individuals in the year 2014 were unavailable since the Health Panel has not been conducted in the year 2014. With the dependent variables from the year missing, no other observations from the core study or Work and Schooling Panel would enter the regressions performed in this paper. Therefore, the year 2014 has been left out of the study. The Health Panel survey, Work & Schooling Panel survey and the core study have been conducted in different months within the same years. For the core study, values from May of the corresponding year have been used. The Work & Schooling Panel has been obtained in the months April and May of the corresponding year. The Health Panel is based

on data from November and December in most years. An exception is the year 2015, during which the health data has been collected in July and August.

Firstly, individuals with less than two years of observation have been deleted beforehand from the data set since their observations would automatically be dropped from an individual fixed-effects regression. This type of regression can only be performed on panel data, as it will be further explained in the Methodology section in part V. of the paper. This procedure led to a total data reduction by 4,949 observations. This includes dependent, independent and various control variables. The previous and corresponding descriptive statistics table can be obtained in section IX. Appendix A, Table 1 and Table 2. The second table also shows that after deleting all individuals that have only been observed during a single wave, the variable “seven children” did not apply to any individual anymore and can therefore be neglected in further descriptive statistics and regression models.

Additionally, observations of individuals who did not participate in the Health Panel and the Work & Schooling Panel have been dropped, since their observations will not enter the regressions performed in this paper. This is the case because the dependent and independent variables for these individuals are undefined. During the process of dropping the previously mentioned observations, 19,923 observations have been deleted in total. The table of descriptive statistics after dropping those individuals can be found in section IX. Appendix A, Table 3.

Furthermore, observations of individuals below the age of 18 have been removed from the data set, since these individuals are most likely not actively participating in the labor force yet, and often only having part-time jobs next to their education. Since factors related to their education might influence their health outcomes, their observations have been dropped for a more conservative measure of the effect of working hours on the health of an individual. In total, 524 observations of individuals below the age of 18 have been removed from the sample. Also, individuals above and with the Dutch retirement age of 65 (OECD, 2013) have been removed from the sample, since they are likely to not have reported working hours anymore and are furthermore likely to have different characteristics compared to individuals in unemployment. The effects of working past the age of 65 on the mental and general health are beyond the scope of this research. While the retirement age gradually increased from 65 to 66 years from 2014-2018, I will use the conservative value of 65 years as the cutoff point in this paper (OECD, 2013). By dropping the observations with an age above the mentioned age threshold, 10,808 observations have been

removed. The descriptive statistics showing the changes which were made can be found in section IX. Appendix A, Table 4.

As an independent variable of interest, the quantity of weekly working hours of each individual has been used. This variable has been obtained by taking the sum of the self-reported working hours in the job that the individual considers as the most important one and the weekly hours from all other side-jobs of the individual, as self-reported by the subject. By not using a dummy variable of either being unemployed, being part-time employed or being full-time employed, it is possible to exploit all individual data available instead of just analyzing the effect of the type of employment on the health of individuals who changed their work pattern from e.g. part-time to full-time when using an individual fixed-effects regression (Booth & Van Ours, 2008). In addition, the self-reported working hours, as used in this paper, are not always equal to the number of hours which the employer and employee have agreed on in the individuals' work contract. Using a self-reported variable has the advantage that the average hours an individual works e.g. overtime, outside of the contract, are captured. This method is therefore likely to remove the bias of wrongly reported working hours due to differences from the initial contract. Also, due to the survey being anonymous and independent from the workplace of the individual, there are no incentives to under- or over report the weekly working hours (CentERdata, 2018). The observations of the variable ranged from 0 weekly working hours to 150 working hours with a mean of approximately 30.3 working hours per week. A boxplot of the working hours can be found in section IX. Appendix A, Figure 1 of the paper. The boxplot detects multiple outliers outside of the displayed interval. These outliers represent values which are greater than the value of the upper quartile of the distribution multiplied with a factor of 1.5. All detected outliers have been investigated by comparing the outliers with the quantity of working hours in previous or following periods. The outliers which have values above or equal to 100 working hours per week have been deleted from the data set for logical reasons. A week of 100 working hours would result in an average work day of 20 hours of market work, which is unrealistic to maintain for a year. In total, 5 outliers have been removed. None of the detected potential outliers below the value of 100 has been removed since the individuals corresponding to the outliers had high quantities of weekly working hours in periods before or after the period of the outlier. This suggests that the data is unlikely to be misreported. Therefore, to maintain a conservative research approach, the potential outliers below the quantity of 100 weekly working hours remained in the sample. A boxplot of the

working hours after the removal can be found in section IX. Appendix A, Figure 2. Additionally, observations of individuals with missing working hours have also been dropped from the data set, since they will not enter the regression models which are all based on the working hours as an independent variable. In Table 5, the descriptive statistics of the final data set, which has been used for the research conducted in this paper, can be seen. The table includes the changes which have previously been outlined in this paragraph. By including the changes, the mean working hours dropped to approximately 30.26 per week, compared to 30.3. The minimum weekly working hours in the sample remained at 0, while the maximum is given by 92 weekly working hours, due to the removal of the outliers.

Table 5. Descriptive Statistics

<i>Variable</i>	<i>Observations</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<i>Dependent Variables</i>					
general health	13,080	3.229205	.7366231	1	5
general health compared to t-1	13,077	3.007035	.6416364	1	5
anxious	13,061	2.059031	.9872653	1	6
down	13,061	1.62009	.9132716	1	6
peaceful	13,061	4.253886	1.058695	1	6
depressed	13,061	1.986295	1.001092	1	6
happy	13,061	4.287957	1.0263	1	6
<i>Independent Variable</i>					
working hours	13,080	30.26116	15.32716	0	92
<i>Control Variables</i>					
net household income	11,746	3264.551	1955.323	0	133.537
age	13,080	44.35665	12.48188	18	64
paid	13,080	.9200306	.2712562	0	1
female	13,080	.5197248	.4996299	0	1
urban	12,982	.6411185	.4796908	0	1
parental leave	13,080	.0164373	.1271549	0	1
handicap	13,072	.2325581	.422479	0	1
<i>Civil Status</i>					
married	13,080	.5464067	.4978608	0	1
separated	13,080	.0037462	.0610936	0	1
divorced	13,080	.0957187	.2942163	0	1
widow	13,080	.0134557	.1152199	0	1
<i>Sector of Work</i>					
agricultural sector	12,990	.0188607	.1360381	0	1
mining sector	12,990	.0005389	.0232083	0	1
industrial sector	12,990	.0934565	.2910823	0	1
production sector	12,990	.0101617	.1002955	0	1
construction sector	12,990	.0388761	.193307	0	1
retail & trade sector	12,990	.0812933	.2732955	0	1
catering sector	12,990	.0372594	.1894041	0	1
transport & storage sector	12,990	.0441109	.2053493	0	1
financial sector	12,990	.0445727	.2063717	0	1
business service sector	12,990	.0668976	.2498542	0	1
governmental sector	12,990	.0902232	.2865124	0	1
educational sector	12,990	.0899153	.2860714	0	1
health sector	12,990	.2046959	.4034948	0	1
environmental & cultural sector	12,990	.0254811	.1575873	0	1
<i>Education Level</i>					
primary education	13,080	.0126911	.1119421	0	1
middle school education	13,080	.1777523	.3823187	0	1
secondary school education	13,080	.3300459	.4702473	0	1
post-secondary education	13,080	.1490061	.3561081	0	1
tertiary education	13,080	.2884557	.4530615	0	1
post-tertiary education	13,080	.0212538	.1442348	0	1
other education	13,080	.0172018	.1300278	0	1

Table 5. Continued

Children					
one child	13,080	.1664373	.372487	0	1
two children	13,080	.258104	.4376082	0	1
three children	13,080	.0964067	.2951595	0	1
four children	13,080	.0142966	.1187153	0	1
five children	13,080	.0061927	.0784524	0	1
six children	13,080	.0012232	.0349548	0	1
Partner					
health	6,341	3.206119	.7532896	1	5
working hours	5,649	30.08072	15.33286	0	90
Year					
year 2013	13,080	.2109327	.4079863	0	1
year 2015	13,080	.170107	.3757412	0	1
year 2016	13,080	.2075688	.4055818	0	1
year 2017	13,080	.1747706	.3797853	0	1

Furthermore, the sample has been split into male and female individuals to observe if there are differences between the two groups. From Figure 3, which shows a histogram of the working hours in the sample split by gender, it becomes evident that the working patterns of women and men are significantly different. While most men ($\approx 22\%$) in the sample work in full-time jobs with 40 working hours per week, there are multiple peaks in the percentage of female working hours. The mean of working hours for females in the sample lies at approximately 25.32 per week, while the males work on average 35.61 hours per week. Due to the varying working patterns per gender, and under the assumption that one of the factors determining the choice of the working hours is the desire to maximize health, the graph suggests that the effect of working hours on the health of individuals should be furthermore investigated separately by gender.

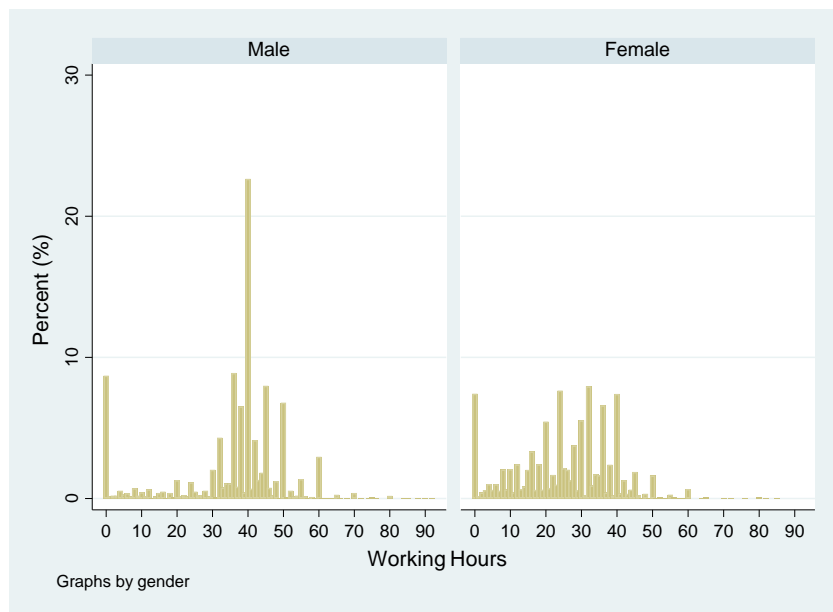


Figure 3. Histogram of Working Hours Split by Gender

Multiple dependent variables have been used, which can be divided into the categories of “general health” and “mental health”. Two dependent variables worked as determinants of the general health. For the first one, respondents were asked to rate their own general health from 1 (lowest) to 5 (highest). The mean of the general health in the sample lies at approximately 3.2, indicating a moderate general health.

The second variable also consists of a rating of how the respondent assesses his own health compared to the previous year, ranging from 1 (=considerably poorer) to 5 (=considerably better). The mean of the sample lies at a rating of approximately 3.01, indicating that, on average, the health in the sample stayed unchanged over the time period of a year. To assess the mental health of an individual, five variables have been selected, which are asking for the frequency of different mood states of the individual. The employees have been asked to evaluate how frequently they feel anxious, down, peaceful, depressed and happy ranging from 1 (=never) to 6 (=continuously). The variables “anxious”, “down” and “depressed” have means of approximately 2.06, 1.62 and 1.99, respectively (see Table 5). This indicates that individuals from the sample, on average, felt seldomly anxious, never to seldomly down and seldomly depressed. The variables “peaceful” and “happy” have a mean of 4.25 and 4.29 respectively, which means that the individuals from the sample often felt peaceful and happy (CentERdata, 2018).

Moreover, multiple control variables were added to isolate the true effect of the working hours on the various health measurements. It has been controlled for possible time-varying variables including the net household income, if the individual is performing paid work, gender, urbanity of the living area, parental leave, handicaps, civil status, sector of work, education level, number of children, the health and working hours of the partner and the year of the observation. These variables can be further split into binary and continuous variables.

The first binary variable listed in the descriptive statistics is called “paid”, which describes if the work of the respondent is paid or working on a voluntary basis. The variable can take the values 0 (=not paid) and 1 (=paid) only. Approximately 92.01% of the sample have a job with a salary (see Table 5). The variable female determines the gender of each individual. If the variable has a value of 0, it indicates that the individual is male, while a value of 1 indicates that the individual is female. Approximately 51.97% of the used sample are female (see Table 5). Another binary variable called “urban” has been generated to indicate how urban the area is, that the individual is living in. The variable can take the values 0 (=not urban) and 1 (=urban). It was based

on a survey question which asked the participants to rate the urbanity of their living area from 1 (= extremely urban) to 5 (= not urban). To achieve a sufficient number of individuals per category of urbanity to interpret the coefficient related to the factor, urbanity has been split into two categories: “urban” and “not urban”. A living area has been considered as urban if a value below 3 had been reported, which is corresponding to a moderately urban living area. With a value of 4 or 5, a living area has been considered as not urban. Approximately 64.11% of the sample indicated to be living in an urban area. Another control variable, which has been added because it might influence the working hours and health of an individual, is called “parental leave”. This variable takes the value 0 if an individual is not on parental leave, while a value of 1 indicates that the individual has been on parental leave in the corresponding year of observation. On average, 1.64% of the sample have been on parental leave per observed year (see Table 5). The following binary variable “handicap” can either take the value 0 (= no handicap) or 1 (= handicap). The question which has been used in the survey asked the respondents to indicate the value of 1 if they either had a long-term disease, affliction, handicap or if they suffered from the results of an accident. On average, 23.26% of the sample have reported a type of handicap (see Table 5).

Next, four binary variables for the civil status of the respondents have been generated. A value of 0 represents a non-married individual, while a value of 1 represents either a married, separated, divorced or widowed individual, depending on the variable. As it can be seen in the descriptive statistics in Table 4, approximately 54.64% are married, 0.38% separated, 9.57% divorced and 1.35% widowed. Therefore, it can be estimated that 34.07% of the sample is non-married.

The working sector of an individual is captured by 14 binary variables with a value of 0 referring to an “other sector” and a value of 1 referring to the stated name of the sector. The biggest sector, with 20.48% of all individuals in the sample, is the health sector (see Table 5).

Initially, the survey allowed for 28 different types of education levels. This led to an insufficient number of individuals who have been observed per education category to draw any conclusions on the bias arising in the model due to distinct levels of education. Therefore, the education levels have been regrouped into eight categories with an approximately equal rank, which can be seen in Table 5. The most common level of education, with 33.01% of the sample, is a finished secondary school education. The second most common completed education level in the sample is tertiary education, with approximately 28.85% (see Table 5).

The number of children has been split into 6 binary variables which are ranging from the value 0 (= no children) to up to 7 children. Therefore, the value 1 can denote 1 to 7 children depending on the binary variable. Nevertheless, the binary variable indicating seven children has been dropped since no observation of seven children has been left after the previously mentioned adjustments to the data. The education level has been recoded into seven binary variables with the value 0 for all of them (= no education) being the lowest level of completed education and the value 1 being one of multiple education types. Approximately 45.73% of the sample do not have any children, while two children (25.81%) is the most common number of children in the sample (see Table 5).

In addition, a variable which is denoting the health of the partner living in the same household has been generated. Except for just controlling for the possible situation that a worker will stay at home to take care of his or her partner, the variable also aims to see if there is a cross-partner effect of health which could arise from e.g. feeling for the partner or being limited regarding some actions. The same procedure has been followed with the working hours of the partner. The cross-partner effects are following the methodology of Booth & Van Ours (2008).

Furthermore, dummies for the year of the observation have been generated, ranging from 2015 to 2017. A value of 0 for all binary variables indicates that the observation has been made in the year 2014, which denotes the reference category.

Continuous variables for which will be controlled for in this paper are the age and the net monthly household income of the individual. On average, an individuals' household in the sample had a net household income of 3264.55€ per month. As already mentioned beforehand, the age has been limited to the range between 18 and 65 years, as it can also be seen as the minimum and maximum in the descriptive statistics in Table 5.

Also, the binary and self-reported variable gender will later be used to further divide the effect of working hours on females and males. Since the gender of an individual is time-invariant, the variable will not be used as a control variable in the used regression models, as further explained in section V. Due to many missing gender observations, observations in missing periods have been generated by replacing them with the observation from the previous or following period of the same individual. This methodology is valid since "gender" is a time-invariant variable. Furthermore, the working sectors have been separated into the categories "blue collar sector" and

“white color sector” to further divide the effect of working hours on the health measures by “blue collar” and “white-collar”.

V. Methodology

The paper aims to answer the research question, as stated in the introduction, based on three distinct hypotheses. This has the objective to allow for different outcomes of the effect of working hours on health regarding the general and mental health of the Dutch individuals. The first and second hypotheses are stated as follows:

Hypothesis 1: The quantity of working hours, on average, significantly affects the general health of an individual.

Hypothesis 2: The quantity of working hours, on average, significantly affects the mental health of an individual.

To test the first and second hypothesis, multiple individual fixed-effects regressions were used. These regressions estimate the effect of the quantity of working hours on the general or mental health of an individual living in the Netherlands, respectively. As already mentioned in the data section, refraining from using a regression in which the independent variable is a dummy, e.g. part-time, full-time, or unemployed, leads to more observations entering the model, which furthermore increases the internal validity of the results (Booth & Van Ours, 2008; Booth & Van Ours, 2009). Using an individual fixed-effects regression has various advantages over other available panel data methodologies, including e.g. matching. Most of these methods are only able to control for observable differences across individuals, which leaves them with a possible bias in the coefficient related to the explanatory variable (Khandker et al., 2010). With individual fixed-effects, the observations of the individuals in the sample are compared with observations of the same individual in an earlier period. By taking within-individual differences, all time-invariant variables including e.g. the genetics or family background of an individual are automatically controlled for and therefore unobserved time-invariant variables will be no concern for the internal validity of this research. The only variables which still must be accounted for are the time-varying variables which are correlated with the independent and dependent variable and therefore a potential bias in the model. Therefore, multiple time-variant control variables will enter the regressions (Khandker et al., 2010).

Three regression models were used to test the effect of the working hours on the general and mental health outcomes. They differ in the amount of control variables which are entering the model. The following function describes the first individual fixed-effects regression model, which has been used to test hypothesis 1 and 2:

$$Y_{i,t} = \alpha + \beta T_{i,t} + \gamma (T_{i,t})^2 + \delta X_{i,t} + \theta S_{i,2013} + \mu S_{i,2015} + \pi S_{i,2016} + \rho S_{i,2017} + \varepsilon_{i,t} \quad (1)$$

Firstly, the regression will be explained with regards to the first hypothesis. In each model, $i = 1, \dots, I$ stands for the individuals in the sample and t denotes the year of the observation. The dependent variable $Y_{i,t}$ denotes the two dependent variables of general health and general health compared to the previous year of observation of the individuals. These dependent variables have been previously explained in the data section of the paper. Since two dependent variables were used to investigate the first hypothesis, the first model will be run two times in total, with the corresponding dependent variable, to test the first hypothesis. The constant α denotes the average of all individual specific fixed-effects and includes all time-invariant characteristics of the observed individual. The independent variable $T_{i,t}$ represents the average number of weekly working hours. The squared value of the number of working hours, which is given by $(T_{i,t})^2$, also enters the model to account for a non-linear behavior of the effect of the working hours on the general health measures. Being unemployed can be expected to have a strong negative effect on the mental health, which might be reversed with more hours of work and increase again with working too much. The vector $X_{i,t}$ includes a set of time-variant control variables. In the first model, those control variables will be the net household income, age, payment, urbanity of the living area, parental leave, handicap and all variables denoting the civil status, education level and number of children. The terms $S_{i,\text{year}}$ denote dummy variables for each year of an observation, which the model controls for. The error term is included with the coefficient $\varepsilon_{i,t}$. For the second hypothesis, the same model has been used. The variable $Y_{i,t}$ denotes one of five measures for the mental health of an individual. The five measures, as explained in the data section, are the frequency of anxiety, feeling down, feeling peaceful, feeling depressed and feeling happy. The model has been used five times, with each measure entering the model as a dependent variable once.

The second regression model which has been used can be explained by the same formula as in (1). Nevertheless, it differs in the control variables which are entering the vector $X_{i,t}$. Additional to the control variables in the first model, the second model also controls for the sector

of work of an individual. Also this regression has been performed with all measures of general and mental health to test the first and second hypothesis.

Furthermore, a third individual fixed-effects model has been used. In the corresponding formula, another variable, as compared to model (1), namely $Z_{i,(t-k)}$, enters the model. The model can be described by the following equation:

$$Y_{i,t} = \alpha + \beta T_{i,t} + \gamma(T_{i,t})^2 + \delta X_{i,t} + \theta S_{i,2013} + \mu S_{i,2015} + \pi S_{i,2016} + \rho S_{i,2017} + \sigma Z_{i,(t-k)} + \varepsilon_{i,t} \quad (2)$$

$Z_{i,(t-k)}$ represents the lagged values of an individual's general or mental health measure, which enters the extended model to remove a bias in the model due to previous health outcomes. Since a previous health state can affect the working hours, as well as the current health state of an individual, the variable has been entered as a control variable. The subscript $k = 1$ stands for the lagged value, with the value 1 denoting a lagged value from the year before the year of the observation.

Additionally to the previously mentioned hypotheses, a third hypothesis was investigated in this paper, which is stated as follows:

Hypothesis 3: The quantity of working hours has a stronger effect on the mental health of individuals working in white-collar sectors compared to individuals who work in blue collar sectors.

For this hypothesis, the results will be separated into different working sectors. This has been done with the objective of analyzing if the mental health of workers in certain sectors are affected more by their working hours than workers in other sectors. This approach helps to arrive at a more detailed conclusion for possible interventions. Two models have been used to test the third hypothesis. Model (1) has been used to estimate the effect of working hours on the mental health. As compared to the methodology for hypothesis 2, the regressions have been performed separately for blue collar and white-collar workers. The second model used for the investigation of the third hypothesis will be referred to as Model 4. It is equivalent to the model denoted by equation (2). Nevertheless, it does not control for the working sectors since it has been run for blue collar workers and white-collar workers separately. A summary of all variables entering the four individual fixed-effects regression models can be found in Table 6 on the following page.

Table 6. Overview of the Used Variables per Model

	Dependent Variable			
	Model 1	Model 2	Model 3	Model 4
working hours	Yes	Yes	Yes	Yes
working hours ²	Yes	Yes	Yes	Yes
net household income	Yes	Yes	Yes	Yes
age	Yes	Yes	Yes	Yes
paid	Yes	Yes	Yes	Yes
urban	Yes	Yes	Yes	Yes
parental leave	Yes	Yes	Yes	Yes
handicap	Yes	Yes	Yes	Yes
<i>Civil Status</i>	Yes	Yes	Yes	Yes
<i>Sector of Work</i>	No	Yes	Yes	No
<i>Education Level</i>	Yes	Yes	Yes	Yes
<i>Children</i>	Yes	Yes	Yes	Yes
<i>Partner</i>	Yes	Yes	Yes	Yes
<i>General Health Lag</i>	No	No	Yes	Yes

Furthermore, for the most explanatory model per dependent variable related to hypothesis 1 and 2, the regression model has been recomputed for male and female participants of the survey separately. The most explanatory model is, in this paper, considered to be the model for which no additional significant control variables can be added. If the results were significantly different from the ones obtained for the regressions including both genders and if the working hours or working hours² were of significance, they have been additionally described in the results section.

VI. Results

In this section, the results of analyzing all three hypotheses, as mentioned in the methodology section of this paper, are shown and described. The results were split into results regarding the general health, mental health and the general and mental health of blue collar and white-collar workers, as corresponding to the three hypotheses.

A. General Health

Firstly, in this section, the results with regards to the first hypothesis, which is analyzing the relationship of the working hours and working hours² with two measures of general health, will be analyzed. The two measures for general health are a self-reported value of general health on a

scale from 1-5 and a self-reported value of the general health compared to the previous year of observation on a scale from 1-5, as described more detailed in the methodology section of the paper.

In the following table (see Table 7), the individual fixed-effects regression models 1-3, as previously described in the methodology section, have been used. The table shows the estimated coefficients related to each variable in the model. The first model includes the independent variables working hours and a squared value of the working hours to account for a possible non-linear behavior of the relationship between the general health and working hours of an individual. Furthermore, it includes multiple covariates, also including the civil status, education level, number of children, partner's health and working hours and the years of the observations. The model (see Table 7) shows that neither the working hours nor the squared value of the working hours significantly affect the self-reported general health of an individual at a 0.05 level of significance. Also the coefficients for the net household income, age, payment for work, urbanity of the living area and parental leave are insignificant in the model. At a 0.05 significance level, having a handicap decreases the general health of an individual, *ceteris paribus*, by 0.31. The only civil status which is of significance is being separated which leads, *ceteris paribus*, to a decrease of 0.54 in the general health. Nevertheless, this coefficient is only significant at the level of 10%. A strong significance below the 0.05 level, can be assigned to the cross-partner variable of health. *Ceteris paribus*, an increase of 1 in the self-reported health of the partner will lead, on average, to an increase of 0.35 in the health of the individual. In model 2, the working sectors of the individuals have been added to the explanatory variables in model 1. As in the previous model, the coefficient for being handicapped is still significant at the 0.05 level with an unchanged rounded value of -0.31. Also being separated, *ceteris paribus*, still results in a decrease of the general health by 0.55 at a 10% significance level. Also the significance and margin of the coefficient related to the partner's health stay unchanged compared to the previous model. In the third model, which also includes the lag of the general health value from the previous year, the age of an individual has a negative impact on the individuals' general health at the 0.1 significance level, if all other variables are held constant. The same applies to the urbanity of the living area, for which a value of 1 (=urban) leads to an even stronger decrease of approximately 0.21 in a person's general health. The variable handicap is still significant at the 0.05 significance level with a value of -0.37. The positive effect of being a widow, which had no significant effect in the previous models, became

only significant at the 0.15 significance level. Of the added working sectors, the agricultural and educational sector have a significant negative effect on the general health in the third model. The environmental and cultural sector only has a negative effect at the 0.15 significance level. Also in the third model, the partner's health is highly significant ($p < 0.05$) and increasing the general health of the person, but also the working hours of the partner lead to a significant ($p < 0.05$) increase of the general health in the third model. All three models have omitted variables, which is due to these variables dropping out of the sample when further control variables were added. No model in Table 7 has shown a significant effect of the working hours on the general health. Also, when investigating for females and males separately, the significance of the working hours and working hours² stays unchanged. Nevertheless, the procedure has been outlined for other significant models.

Table 7. Individual Fixed-Effects Regressions of General Health on the Working Hours and Working Hours²

Variable	General Health		
	Model 1	Model 2	Model 3
Independent Variables			
working hours	.000986 (.0021744)	.0010671 (.0021873)	-.002217 (.0039642)
working hours ²	-.0000197 (.0000421)	-.0000179 (.0000424)	8.21e-06 (.0000748)
Control Variables			
net household income	9.17e-06 (.0000143)	9.14e-06 (.0000144)	-.000027 (.0000267)
age	-.0305659 (.030952)	-.025813 (.0312239)	-.2079313** (.1094087)
paid	-.0096526 (.0392615)	-.0092416 (.0395684)	.0782419 (.0868828)
urban	-.0085134 (.124029)	-.0126931 (.1255034)	-.5692244** (.3248567)
parental leave	-.0404986 (.070915)	-.0356518 (.0712452)	-.0532384 (.1217348)
handicap	-.3071136*** (.0431898)	-.3105668*** (.0436493)	-.3721841*** (.0755251)
Civil Status			
married	.0344234 (.078273)	.0378351 (.0786376)	-.0031663 (.1720152)
separated	-.5399902** (.2796641)	-.550652** (.281429)	(omitted)
divorced	.1255334 (.1229199)	.1242792 (.1234583)	.2089886 (.2542924)
widow	-.0146256 (.233362)	.0567019 (.2394811)	.6322303* (.4343214)
Sector of Work			
agricultural sector	-	-.1757385 (.248281)	-1.231606*** (.6047134)
mining sector	-	(omitted)	(omitted)

Table 7. Continued

industrial sector	-	.0774251 (.109817)	.1068536 (.2021345)
production sector	-	.2641822 (.1931507)	-.1435815 (.4165666)
construction sector	-	.1890443 (.1602488)	.2966025 (.3417962)
retail & trade sector	-	.1632705 (.0923234)	.1525765 (.2228047)
catering sector	-	-.0998593 (.1282085)	.0536016 (.3293228)
transport & storage sector	-	.0263784 (.1142435)	-.2065463 (.2309199)
financial sector	-	.0606639 (.1374118)	-.0061516 (.3267977)
business service sector	-	.0297355 (.0958084)	.0083631 (.1842169)
governmental sector	-	.0004415 (.1192189)	-.0807483 (.3008325)
educational sector	-	-.1210381 (.1410483)	-.746531*** (.2993323)
health sector	-	-.0282751 (.0888396)	-.1599037 (.1683069)
environmental & cultural sector	-	.085344 (.1274232)	-.5269605* (.34625)
Education Level			
Primary education	-.2259927 (.3196037)	-.104996 (.3276714)	.0800215 (.6101953)
Middle school education	-.1100542 (.2560629)	.0116196 (.2658826)	-.0544993 (.4889052)
Secondary school education	-.2452992 (.2606953)	-.1318121 (.2698805)	-.3500995 (.4983397)
Post-secondary education	-.2018841 (.2615782)	-.0852362 (.2708618)	-.2265371 (.4939838)
Tertiary education	-.1570334 (.2624144)	-.0373408 (.2714786)	-.2375764 (.4937772)
Post-tertiary education	-.2163309 (.2689042)	-.1016459 (.2776683)	-.3122274 (.5044458)
Other education	-.199741 (.2727982)	-.0864862 (.2813358)	-.1273935 (.5111116)
Children			
one child	.0386318 (.0456171)	.038974 (.0467255)	.1262063 (.0886436)
two children	-.0340219 (.0600659)	-.0387187 (.0606021)	-.0394998 (.1137677)
three children	-.0397339 (.0959845)	-.041375 (.096491)	.1265735 (.1896491)
four children	.2166365 (.1639258)	.214063 (.1646831)	-.0117684 (.2819307)
five children	-.0306953 (.2411792)	-.0341022 (.241658)	-.0478753 (.3271267)
six children	(omitted)	(omitted)	(omitted)

Table 7. Continued

Partner			
health	.3458982*** (.0133789)	.3427746*** (.0135012)	.3373848*** (.0249793)
working hours	.0005844 (.0006865)	.0005083 (.0006917)	.0032706*** (.0013059)
Year			
year 2013	.0001904 (.0348868)	-.0070308 (.0351925)	-.8627331 (.4374037)
year 2015	.0421115 (.084516)	.0287926 (.0851955)	(omitted)
year 2016	.0484789 (.12554)	.0308831 (.1265197)	-.2506745*** (.1076752)
year 2017	.1367039 (.1540139)	.1085972 (.1553597)	(omitted)
general health lag (t-1)	-	-	-.0339439 (.0351961)
constant	3.686598*** (1.439679)	3.350032*** (1.456244)	13.53471*** (5.574656)
Observations	4,905	4,866	2,309
Number of Individuals	2,374	2,355	1,538

Standard errors given in parentheses () ; *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

The same three models have been run with the value of the general health compared to the previous year as a dependent variable . The corresponding table to the results can be found in Appendix B, Table 7. In model 1, the coefficient of the squared quantity of the working hours is significant at the 10% level. As before, a handicap has a significant ($p < 0.05$) negative effect on the compared value. The same applies to the coefficient related to the health of the partner and having five children. Furthermore, a positive effect at the 10% significance level of the year 2015 being the year of the observation and having four children has been obtained. In model 2, again, the coefficient related to the squared value of the working has a positive effect on the general health at the 10% significance level. Also, the significance and margin of the coefficient related to having a handicap remains unchanged. By adding the working sectors, the production sector affects the compared general health in model 2 positively at the 0.05 significance level. Again, having four children significantly affects a person's general health positively, while the positive effect of one child is only significant at the 10% level. In model 3, the added lag of the general health has a negative effect on the current general health at a 10% significance level. The partner's health is no longer significant in the model, while urbanity of the living area and working in a business service sector positively and significantly ($p < 0.05$) affect the compared health value. Other coefficients, which are related to the storage and transport sector , as well as the category of other education, affect the dependent variable at the 0.10 significance level negatively and

positively, respectively. Since in none of the three models the working hours had a significant effect of the working hours on the compared health when split by gender, the results have again not been further displayed separated into a male and female sample to research the differences in their margin.

B. Mental Health

In this section, the results which correspond to the second hypothesis are described. All tables show the results of regressing a measure of mental health on the working hours and squared working hours of an individual. Since there are five measures of mental health in this paper, the results will be limited to the description of coefficients which are significant at the 0.05 significance level.

Table 8 describes the results which have been obtained by using the working hours and squared working hours of an individual as the independent, and the self-reported frequency of anxiety as the dependent variable. The results have been estimated by the three regression models, as described in the data section of the paper. In the first model, which does not control for previous values of the frequency of anxiety and the working sector, there is a positive and significant effect ($p < 0.05$) of being paid for working on the frequency of feeling anxious. This means that, on average, paid workers report higher values for the frequency of anxiety. Also, being on parental leave significantly increases the value reported for anxiety. Again, as already obtained in the previous models, the health of the partner influences the anxiety level of an individual. A higher reported general health for the partner correlates with a lower frequency of feeling anxious. The other variables in the model have not been significant at the 0.05 significance level. In model 2, it can be seen that the working hours significantly ($p < 0.05$) increase the frequency of feeling anxious. Also, as in model 1, the effect of being paid, being on parental leave and the partner's health are significant at the 0.05 level and stay relatively unchanged. Nevertheless, none of the added working sectors in model 2 obtained a significance below the 0.10 level. In model 3, the working hours and the squared value of the working hours were estimated to have a positive and negative effect on the frequency of anxiety, respectively. Since the constant is not significant, it is not possible to interpret the margin of the effect. Still, it can be concluded that for model 3, that the curvature of the function estimating the effect of the working hours on the frequency of feeling anxious is downwards – the function is concave. Therefore, according to model 3, the frequency

of feeling anxious decreases with increasing working hours. Nevertheless, the added lag and working sectors are not significant at any specified level. Compared to the previous models, also the partner's health was no longer been reported as significant at a level below 0.10.

Table 8. Individual Fixed-Effects Regressions of Frequency of Anxiety on the Working Hours and Working Hours²

Variable	Anxious		
	Model 1	Model 2	Model 3
Independent Variables			
working hours	.0081612 (.003868)	.0079635*** (.0038951)	.0147304*** (.0067071)
working hours ²	-.0001209* (.000075)	-.0001164* (.0000756)	-.0002776*** (.0001265)
Control Variables			
net household income	7.38e-06 (.0000254)	7.22e-06 (.0000257)	.1852013 (.0000452)
age	-.0339454 (.0550666)	-.0347943 (.0556034)	-.1255863 (.1852013)
paid	.1427719*** (.0700848)	.1568888*** (.0707249)	.2283424* (.1458774)
urban	-.001071 (.2206118)	-.0475068 (.223451)	1.351543*** (.5486744)
parental leave	.3650614*** (.1261374)	.3624996*** (.1268455)	.358237** (.2056971)
handicap	.1196593* (.0768226)	.1158288* (.0777139)	.0694194 (.1273024)
Civil Status			
married	.032919 (.1392297)	.0438546 (.1400088)	-.1883927 (.291054)
separated	.5251458 (.4974415)	.574841 (.5010675)	(omitted)
divorced	.0201926 (.2186448)	.0318108 (.2198115)	.028386 (.4304569)
widow	-.3854388 (.4150934)	-.5583012 (.4263957)	-1.473063*** (.7352227)
Sector of Work			
agricultural sector	-	-.1570151 (.4420792)	1.392609 (1.023023)
mining sector	-	(omitted)	(omitted)
industrial sector	-	-.3040963* (.195609)	-.3357161 (.3420823)
production sector	-	-.3277482 (.3439133)	-.4596349 (.7050543)
construction sector	-	-.1671211 (.2853762)	-.3870439 (.5784999)
retail & trade sector	-	.1223154 (.1644901)	.2966817 (.3767197)
catering sector	-	.1834524 (.2283529)	-.3748306 (.5570794)
transport & storage sector	-	-.170988 (.2034805)	.419889 (.3908187)
financial sector	-	-.1417147 (.2447278)	.3421388 (.5529965)

Table 8. Continued

business service sector	-	-.1243621 (.1707779)	-.2206784 (.3115889)
governmental sector	-	-.1735815 (.2124219)	-.3505814 (.5086545)
educational sector	-	.236036 (.2514021)	.2994013 (.5068142)
health sector	-	.0381542 (.1611571)	.0552339 (.2842776)
environmental & cultural sector	-	.0679397 (.2269931)	.2041933 (.5867361)
Education Level			
Primary education	.1171652 (.5684872)	.0546582 (.5833894)	.6285552 (1.033027)
Middle school education	-.0309964 (.45546519)	-.1014116 (.4733795)	.7877227 (.8276583)
Secondary school education	.0482942 (.4637086)	-.0134689 (.4804992)	.8016034 (.843306)
Post-secondary education	-.1114429 (.4652725)	-.1581655 (.4822471)	.5473915 (.8359312)
Tertiary education	-.1284663 (.466772)	-.1722006 (.4833445)	.4342464 (.8356254)
Post-tertiary education	-.2788123 (.4783115)	-.3303238 (.4943637)	.3311304 (.8538574)
Other education	-.076826 (.4852388)	-.1379507 (.5008944)	.3911499 (.8648031)
Children			
one child	.0278003 (.08114)	.0387238 (.0831925)	.1267152 (.1500872)
two children	.0437995 (.1068401)	.0473215 (.1078972)	.0667603 (.1929319)
three children	-.1619435 (.17073)	.1597751 (.1717947)	-.1560331 (.3213425)
four children	.3021474 (.2915778)	.3062242 (.2932054)	.7990668** (.4768847)
five children	.0158356 (.4289891)	.0265723 (.4302498)	.5603458 (.5534434)
six children	(omitted)	(omitted)	(omitted)
Partner			
health	-.0671887*** (.0238113)	-.0665433*** (.0240522)	-.0352089 (.0422888)
working hours	.0010826 (.0012222)	.0013409 (.0012325)	.0031894* (.0022094)
Year			
year 2013	-.1200129** (.0620849)	-.1210856** (.0626877)	-.5777163 (.7402404)
year 2015	-.1034623 (.1503461)	-.0987565 (.1516997)	(omitted)
year 2016	.0078713 (.2233619)	.0155141 (.2253199)	-.1048932 (.1822847)
year 2017	.0196883 (.2740035)	.0296189 (.2766615)	(omitted)
anxious lag (t-1)	-	-	-.0350963 (.0385667)
constant	3.547035 (2.561564)	3.671529 (2.593572)	6.690189 (9.439376)
Observations	4,901	4,862	2,304
Number of Individuals	2,374	2,355	1,533

Standard errors given in parentheses () ; *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

Model 1 has been furthermore estimated regressed separately for male and female survey participants (see Table 9). It can be seen that when the regression is performed by gender, the correlation of working hours and the frequency of feeling anxious, as well as the correlation between the squared value of the working hours and the frequency of feeling anxious becomes significant for males. Since the constant is not significant, no description of the exact course of the function of the working hours and frequency of feeling anxious can be made. Nevertheless, the value of the reported frequency of feeling anxious is decreasing with increasing working hours. Furthermore, the table shows that a higher reported general health of the partner is correlated with less anxiety for males, nevertheless, the effect has not been obtained for women.

Table 9. Individual Fixed-Effects Regressions of Frequency of Feeling Anxious on the Working Hours and Working Hours² (Model 1), Split by Gender

Variable	Anxious	
	Model 1 (male)	Model 1 (female)
<i>Independent Variables</i>		
working hours	.0112508*** (.0048501)	.0015639 (.0069101)
working hours ²	-.0001794*** (.0000876)	.000042 (.000155)
<i>Control Variables</i>		
net household income	-.0000398 (.0000357)	.0000401 (.0000364)
age	.0189909 (.0761904)	-.0732247 (.0793713)
paid	.3289597*** (.1085273)	.0190574 (.092618)
urban	1.005937*** (.3411866)	-.5949368*** (.2930614)
parental leave	.368237** (.2007004)	.3490153*** (.1653246)
handicap	.185085** (.1023356)	.0422429 (.1155751)
<i>Civil Status</i>		
married	.2829745 (.207319)	-.1372631 (.1910431)
separated	.2652724 (.8302377)	.7027253 (.6480085)
divorced	-.0916359 (.2973343)	.336581 (.3340281)
widow	.5306259 (.5747953)	-1.267673*** (.6009828)
<i>Education Level</i>		
Primary education	.0512691 (.9974656)	-.0351833 (.96525)
Middle school education	-.0222181 (.9243286)	.0229994 (.5384451)
Secondary school education	.0887653 (.9465356)	.0917604 (.5470059)

Table 9. Continued

Post-secondary education	-.086398 (.9519667)	-.0567439 (.5478897)
Tertiary education	-.0489342 (.9525546)	-.1215044 (.5510186)
Post-tertiary education	-.1599273 (.9644732)	-.305298 (.5692484)
Other education	.1444498 (.9763224)	-.1579987 (.5762129)
Children		
one child	.0860299 (.107433)	-.0250254 (.1230257)
two children	.1698743 (.1399102)	-.0865115 (.1647266)
three children	.2250967 (.2463522)	-.5192035*** (.2415356)
four children	.3801405 (.4174589)	.1210555 (.4242897)
five children	-.0256264 (.5661394)	.2167013 (.6755038)
six children	(omitted)	(omitted)
Partner		
health	-.0878903*** (.0321147)	-.0480001 (.0354725)
working hours	.0007532 (.0017202)	.0015132 (.0017554)
Year		
year 2013	-.1037772 (.0851957)	-.1454688* (.0903255)
year 2015	-.2395047 (.2083234)	-.0186446 (.2168349)
year 2016	-.1859476 (.3088411)	.1496551 (.3225137)
year 2017	-.1780195 (.3793734)	.1626455 (.3949617)
constant	.0691226 (3.674412)	5.883153* (3.609465)
Observations	2,399	2,502
Number of Individuals	1,133	1,242

Standard errors given in parentheses () ; *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

Table 10 in Appendix B displays the results of the three individual fixed-effects models regressing the frequency of feeling down on the working hours, the squared number of working hours and various control variables. In the first model, a handicap and being a parent of four children significantly ($p < 0.05$) increased the average frequency of feeling down. An increase in the health of the partner has been found to, ceteris paribus, lead to a decrease of the frequency of feeling down at the 0.05 significance level. In model 2, by adding the working sectors of the individuals as control variables, the coefficient related to the binary variable handicap remained significant and positive. Furthermore, the civil status of being separated became significant and

can be seen to have a positive impact on the frequency of feeling down (see Table 10). Also, having four children as compared to no children significantly increases the reported value for the frequency of feeling down. As in the previous model, an increase in the partner's health significantly decreases the frequency of feeling down at the 0.05 significance level. In the third model, after controlling for the first lag of the frequency of feeling down, the effect of the urbanity on the reported value for feeling down becomes significant ($p < 0.05$) and increases the frequency significantly, if the living area is reported as urban. Of the working sectors, only being a worker in the business service sector is shown to decrease the frequency of feeling down significantly. Nevertheless, the introduced lag in the third model has not been proven to be significant at the 0.05 significance level.

Table 11 (see Appendix B) shows the individual fixed-effects regressions of the frequency of feeling peaceful on the working hours and squared working hours of an individual. In all three models, having a handicap, *ceteris paribus*, led to a significance decrease in the frequency of feeling peaceful. Furthermore, in the first and second model, with the second one controlling for the working sector of an individual, increasing health of the partner and increasing working hours of the partner led to a significant increase and decrease of the frequency of feeling peaceful, respectively. In the second model, working in the agricultural sector or transport and storage sector led to a significant increase ($p < 0.05$) in the frequency of feeling peaceful, as compared to working in a non-listed sector. Also in the third model, the two sectors, *ceteris paribus*, have been shown to have a positive correlation with the frequency of feeling peaceful. In comparison to the second model, by introducing the first lag of feeling peaceful, working in the construction sector has been shown to also have a positive significant correlation with the frequency of feeling peaceful. A higher reported value for the frequency of feeling peaceful in the previous year has furthermore shown to significantly decrease the current frequency of feeling peaceful. Also, the urbanity of the living area led to a significant increase of the dependent variable, as compared to living in a rural area.

In Table 12 (see Appendix B), the frequency of feeling down has been regressed on the working hours and squared working hours of the individuals in the sample. In the first two estimated models, only the partner's health has been proven as significant ($p < 0.05$) in determining the frequency of feeling depressed for an individual, also after controlling for the working sector of an individual. In the third model, which controls for the first lagged value of the frequency of

feeling depressed, only the lagged value is significant at the 0.05 significance level. A higher value for the reported frequency of feeling depressed in the previous year has been found to be related to a significant decrease in frequency of depression in the following year.

The estimated correlations between the variables in the three models, as mentioned in the methodology section, and the self-reported frequency of feeling happy can be seen in Appendix B, Table 13.

C. General and Mental Health of Blue Collar and White-collar Workers

With the objective of researching the third hypothesis, the first and fourth fixed-effects regression model have been run for blue-collar and white-collar workers separately. Table 14 summarizes the estimated correlations of the working hours, squared working hours and additional control variables with the frequency of feeling anxious. In both models which were run on blue-collar workers, only the binary variable handicap had a significant and positive effect ($p < 0.05$) on the frequency of feeling anxious. For white-collar workers, more variables showed a correlation with the reported anxiety frequency. While in model 1 the effect of the working hours and working hours² on the anxiety value has not been strongly significant ($p > 0.10$), the variables both became significant at the 0.05 significance level when adding the first lagged value of the reported frequency of feeling anxious. Due to the insignificant constant, the exact function giving the correlation between the working hours and regularity of feeling anxious cannot be derived. Nevertheless, the sign of the coefficients signals that the correlation function is convex and that the frequency of feeling anxious is decreasing with increasing working hours. Furthermore, in model 4, living in an urban area significantly corresponds to an increased level of anxiety, while the adverse effect has been observed for being separated from a partner or being a widow. In model 1, being on parental leave or having a paid job is shown to correspond with higher frequencies of feeling anxious, while an increasing health of the partner or the observation being made in 2013 are shown to correspond to lower values of anxiety ($p < 0.05$).

Table 14. Individual Fixed-Effects Regressions of Frequency of Feeling Anxious on the Working Hour and Working Hours², Split by Blue-collar and White-collar Sector

Variable	Anxious			
	Model 1 (blue-collar)	Model 4 (blue-collar)	Model 1 (white-collar)	Model 4 (white-collar)
Independent Variables				
working hours	.0089376 (.0067685)	.0064123 (.0101601)	.0079817* (.0050451)	.0248237*** (.0091565)
working hours ²	-.0001423 (.000144)	-.0001799 (.000219)	-.0001243 (.0000932)	-.0003899*** (.0001601)
Control Variables				
net household income	.0000166 (.0000398)	-.000026 (.0000709)	-8.19e-06 (.0000343)	-1.86e-06 (.0000589)
age	-.1093969 (.0857809)	-.3763848* (.2313955)	-.0028118 (.0729451)	-.0641313 (.2711214)
paid	.048482 (.1176311)	.2605133 (.2381653)	.238361*** (.0919638)	.3010064* (.1839647)
urban	-.0530838 (.526878)	-.5383808 (.8394533)	.1130096 (.2827504)	5.034642*** (1.010339)
parental leave	.1056821 (.1920604)	.2276301 (.2522166)	.4631728*** (.1792678)	.6259218* (.3864603)
handicap	.2898574*** (.1166004)	.416559*** (.2015092)	.0035141 (.1068862)	-.1103615 (.1636516)
Civil Status				
married	-.1069653 (.2395911)	.3370951 (.4128006)	.0895714 (.1833929)	-.5877746 (.4132378)
separated	-.1752941 (.8341803)	(omitted)	.5014864 (.6438661)	(omitted)
divorced	.1130203 (.3167958)	.7993346 (.5656096)	-.2342789 (.3526024)	-1.533433*** (.6866537)
widow	-1.7521** (.9646625)	(omitted)	-.2415318 (.5951831)	-2.109113*** (.9467493)
Education Level				
Primary education	.0425643 (1.009173)	.0995311 (.7379624)	.1748626 (.7878038)	(omitted)
Middle school education	-.1111154 (.9198677)	.2776976 (.4880121)	.1779978 (.5379156)	1.014846 (.7470539)
Secondary school education	.0150734 (.9446724)	.5040065 (.4514289)	.1734821 (.5446429)	.8655352 (.7513938)
Post-secondary education	-.2559602 (.9475704)	.176972 (.4327104)	.0371748 (.5462988)	.4383667 (.7451525)
Tertiary education	-.3087322 (.9495567)	-.0364322 (.4257567)	.0708878 (.5483887)	.3637573 (.7429666)
Post-tertiary education	-.0406614 (.9677164)	.6328732* (.4315927)	-.23999 (.5632096)	.0944661 (.7761671)
Other education	-.3288767 (.9782811)	(omitted)	.1577098 (.5713781)	.4576689 (.7974773)

Table 14. Continued

Children				
one child	.0156065 (.1270431)	-.0217424 (.2361869)	.0723713 (.1143907)	.0590232 (.20533)
two children	-.1204156 (.1593338)	-.2827514 (.2959096)	.1742206 (.1582458)	.091287 (.2811357)
three children	-.2047677 (.2565536)	-.4268137 (.4776441)	-.0798821 (.2425334)	-.3810894 (.4816455)
four children	.4917324 (.3878727)	.6241087 (.5948388)	.1401396 (.4744726)	.5755872 (.8168867)
five children	(omitted)	(omitted)	.0731975 (.4754513)	.3432109 (.6650699)
six children	(omitted)	(omitted)	(omitted)	(omitted)
Partner				
health	-.0471347 (.0367907)	-.072552 (.0645037)	-.071221*** (.032236)	-.0286139 (.0554454)
working hours	.0004228 (.0018893)	.0019214 (.0032239)	.0012117 (.0016742)	.0019558 (.0031022)
Year				
year 2013	-.0261294 (.0967777)	-1.609598** (.9245969)	-.1482964** (.0825018)	-.2699394 (1.080849)
year 2015	.1806148 (.2366767)	(omitted)	-.2304443 (.1974012)	(omitted)
year 2016	.4547869 (.347004)	-.3216827 (.2281079)	-.1899337 (.2963539)	-.0450753 (.2662534)
year 2017	.4930396 (.4257176)	(omitted)	-.1831244 (.3632106)	(omitted)
anxious lag (t-1)	-	-.1086792** (.0560759)	-	.0051639 (.0522831)
constant	7.161486** (4.058442)	20.95317** (11.7622)	1.867527 (3.368827)	1.211554 (13.74711)
Observations	1,955	924	2,985	1,402
Number of Individuals	971	622	1,502	957

Standard errors given in parentheses () ; *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

Table 15 (see Appendix B) shows the results of the individual fixed-effects regression of the frequency of feeling down on the working hours and squared working hours of an individual. While the correlation of the working hours and squared working hours has not been significant at the 0.05 significance level in neither model 1 nor model 4 for both the white and collar sector, the significance of the control variables varied by model and sector. In the first model for the blue-collar workers, which does not control for the first lag of the down variable, only the health of the partner was significantly correlated ($p < 0.05$) with the frequency of feeling down. In the fourth model, in which the first lag of the frequency of feeling down entered the regression, the health of the partner was no longer significantly correlated with the dependent variable. Instead, the household income had a negative correlation with the reported value of feeling down and having

completed primary education, as compared to no education and having three children as compared to no children, had a significant negative correlation with the frequency of feeling down. For the white-collar workers, model 1 (see Appendix B, Table 15) showed that having a handicap, as compared to no handicap, significantly correlates with a higher frequency of feeling down ($p < 0.05$) and being separated, as compared to not having been married, has a significant proportional correlation with feeling down. In model 4, which furthermore includes the first lagged value of the frequency of feeling down, only the lag value can be associated with a significant decrease of the frequency of feeling down, while the urbanity of the area is significantly correlated with a higher self-reported value for the regularity of feeling down.

With Table 16 (Appendix B), the individual fixed-effects regressions of the frequency of feeling peaceful on the working hours and their squared value can be compared across the blue and white-collar sectors. In model 1 with the sample of blue-collar workers, only the working hours of the partner showed a significant negative correlation with the regularity of feeling peaceful. In the extended model 4, the age and having a paid job, as well as the dummies for the years 2013 and 2016 of observation, were significantly correlated with the frequency of feeling peaceful. The introduced lagged value has not been proven to be significant. For white-collar worker, having a paid job or a handicap, as compared to being unpaid and without a handicap, significantly decreased the reported value of feeling peaceful. Furthermore, all education levels, except for primary education, have been associated with a decreased value of the frequency of feeling peaceful. Also, the partner's health and working hours have been correlated with a significant higher and lower reported value for the frequency of feeling peaceful, respectively. In the fourth model, parental leave and being handicapped can be seen to be significantly negatively correlated with the reported value of feeling peaceful. Again, also all education levels have shown a negative correlation. Furthermore, the added lagged value of feeling peaceful can be seen to negatively correlate with the reported value for the frequency of having a peaceful feeling for white-collar workers.

In Appendix B, Table 17, the findings of the regression of the frequency of feeling depressed on the working hours, squared working hours and control variables, as described in the methodology section, can be seen. In model 1 and 4, which have been performed on blue-collar workers, only the urbanity of the living area correlates with significantly lower reported values for the frequency of feeling depressed. The added lagged value of the dependent variable in model 4

has not been of significance ($p > 0.15$). The first model, performed on white-collar workers, did not find any significant correlation between an included variable and the used dependent variable. In the fourth model, by introducing a significant and negatively correlated lag, also the urbanity of the living area had a significant, but positive effect on the frequency of feeling depressed.

In the last table (Appendix B, Table 18), four fixed-effects regressions with the dependent variable “frequency of feeling happy” and the dependent variables working hours and working hours² have been performed. In the first and fourth model, performed on blue-collar workers, the urbanity of the living area and the health of the partner were positively and significantly correlated with the self-reported frequency of feeling happy. For blue-collar workers, the same positive correlation has been found. Nevertheless, in model 1, which has been estimated for white-collar workers, being separated, as compared to being not married, has been negatively associated with the regularity of feeling happy. A positive and significant correlation has been found for urbanity and reporting frequent happiness for white-collar workers.

VII. Discussion and Conclusion

The objective of this paper was to investigate to what extent the quantity of the working hours of an individual in the Netherlands influence his or her general and mental health. To find the effect of the working hours on the general and mental health, three hypotheses have been formulated. This section starts with an analysis of the results mentioned in section VI. A. with respect to the first hypothesis. The first hypothesis stated that the quantity of working hours, on average, significantly affects the general health of an individual. In this paper, the general health of the individuals in the used sample was measured with their self-reported general health on a scale from 1-5 and their self-reported health as compared to the previous year of observation. Firstly, for each measure of general health, the “best-fitting” model has been determined. This has been done by choosing the model, for which it was not possible to add further significant variables. Therefore, model 1 was the model that was chosen to perform best at estimating the true effect of the working hours and control variables on the general health of an individual. For the previously outlined reasons, model 3 has been chosen to most reliably represent the effect of the working hours on the self-reported value for the general health in comparison to the previous year. In both regression models, the quantity of the working hours and the squared value of the working hours

have not been estimated to have a significant effect on the general health or compared general health. Therefore, the first hypothesis, can be rejected.

Nevertheless, the tables deliver interesting findings on other variables influencing the general health of Dutch individuals. For both measures of general health, having a handicap leads to a lower reported health value. Since individuals with a handicap are, to some extent, limited in their actions, it is safe to conclude that having a handicap has a negative impact on the general health of an individual. Furthermore, both regressions show significant cross-partner effects of health. An increase in the health of a partner also leads to an increase of the individual's health. Therefore, it is highly relevant to obtain a clear picture of which variables are improving the health of a person, since workers benefit from their own health effect and an additional positive health effect of their partner.

Furthermore, when looking at the lagged value of general health in Appendix B, Table 7, it can be concluded that individuals with a high reported general health in the previous year are likely to report a lower value in the current year. This finding shows that Dutch people experience peaks in their health which are unrelated to other factors and therefore likely to be random. Furthermore, the year 2013 and 2016 have been found to have a negative effect on the compared health of a Dutch person. In those years, the population might have experienced small health shocks on a country level. The exact cause has, nevertheless, not been determined.

The second hypothesis of this paper will be discussed with regards to the results in the section VI. B. of the paper. The hypothesis stated that the quantity of working hours, on average, significantly affects the mental health of an individual. Table 8 and Table 10-13 (see Appendix B) showed multiple individual fixed-effects regressions of the working hours and working hours² of an individual on his or her measures of mental health. Those measures were namely, the frequency of feeling anxious, down, peaceful, depressed and happy. It is important to state before the interpretation that feeling down, anxious and depressed are measures of bad health, while feeling peaceful and happy are measures of good health, so the reader will not confuse the consequences of the positive and negative correlations and causations found of the working hours with the health measures. For each health measure, the best-fitting of the three regression models, as outlined in the methodology section of the paper, has been chosen. For the variables of bad health, the frequency of feeling anxious, down and depressed, model 1, model 1 and model 3 have been chosen, respectively. For the first two dependent variables, controlling for working sectors or past

values of mental health had no significant effect (see Table 8 and Appendix B, Table 10). For the regression of the working hours on feeling depressed, the first lagged value of the frequency of feeling depressed, has been shown to be a significant control variable (see Appendix B, Table 12). In Table 8 and Table 10-13 in Appendix B, it can be seen that neither the working hours nor the squared working hours had a significant correlation with the health measures for the selected best-fitting models. While in Table 8 the third model shows a significant positive linear correlation and a significant negative quadratic correlation for the working hours with the frequency of feeling anxious and thereby suggests a lower level of anxiety with a higher number of working hours, the model has not been chosen as the most explanatory one, due to the previously stated selection criteria. Nevertheless, when running the best fitting model (see Table 8, Model 1) for men and women separately, the coefficient related to the working hours and squared working hours becomes significant. While the margin of the effect cannot be interpreted due to the insignificant constant in the model, the shape of the function of the frequency of feeling anxious on the working hours can be described. The function, as the previous one (Table 8, Model 3) is concave and decreasing as the number of working hours is increasing. This finding is interesting because it suggests that more working hours for men decrease their level of anxiety and therefore increase their mental health. One possible explanation, when drawing back on the related literature, could be the model of “gender identity” by Akerlof and Kranton (2000). It could be the case that, by performing market work, men feel like they fulfill the role which the society assigns to their gender, which furthermore decreases their anxiety. Nevertheless, the causation can be explained with other factors. Possible explanations would be that working fulltime makes men worry less about their career, prestige or other topics which are relevant in their life. For women, this correlation has not been proven to be significant, which shows that they are unlikely to opt for part-time work, and thereby have decreased working hours as compared to working fulltime, due to the urge to minimize their anxiety. Even though the significant effect of the working hours on the mental health has been derived, it does not apply to the whole Dutch population and therefore does, on average, not hold. Therefore, the second hypothesis has to be rejected.

Even though the working hours cannot be seen as explanatory variables for the general models regressing working hours on the mental health, the models show other interesting findings of variables causing better or worse mental health. The frequencies of feeling anxious and down were negatively correlated with the general health of the partner of an individual and the frequency

of experiencing happiness has been found to be positively correlated with the partner's health. It can therefore be concluded that an increasing health of the partner results in a mental health increase of the individual. As a consequence, the health of individuals should be assigned a high priority by the government, companies and the individual himself, due to the positive cross-partner effect. When increasing the health of one individual, a positive spillover effect is created, and also his or her partner benefits from not proportional increased but slightly increased health. This also justifies the need for and relevance of further research in the area of variables driving the health of individuals. Having a handicap has been related to a higher frequency of feeling down (Appendix B, Table 10) and a lower frequency of feeling peaceful (Appendix B, Table 11). This effect can be explained by handicapped people experiencing some sort of limitation in their daily life, which disrupts their mental health. Therefore, this finding is likely to be less surprising to the reader. Next, the first lagged value has been shown to, on average, increase the frequency of feeling peaceful (see Appendix B, Table 11) and decrease the frequency of feeling depressed (see Appendix B, Table 12). This can be interpreted as follows: If individuals reported a high frequency of feeling peaceful in the previous year, they are also likely to report a high value in the current year. It can be derived that peaceful-feeling individuals are unlikely to suddenly feel a lot less peaceful in a following year and feeling peaceful is rather constant in the long-run. This finding is different from the one in the regressions of the frequency of feeling depressed. Dutch individuals, who had a high reported value of depression in the previous year tend to report lower values of depression in the current year. Therefore, a high frequency of feeling depressed can be expected to be rather not constant in the long-run. The sector a person works in only has an effect on the frequency of feeling peaceful and happy. Furthermore, the number of children has only been correlated with a higher frequency of feeling down, for four children only. This shows that the effect of children on the mental health can be rather neglected. Also a high urbanity of the living area only increased the frequency of feeling peaceful. Also being on parental leave or having a paid job as compared to doing voluntary work led to an increase of anxiety. Individuals might feel a higher pressure to perform well at work if they are receiving a payment for it. Parental leave might have two effects on anxiety. Parents could experience anxiety from suddenly being a parent and therefore having new tasks, while also the reduced number of working hours can cause the anxiety. Nevertheless, the exact cause has not been derived in the regression models. While individuals experience more peacefulness when they are working in the agricultural sector

construction sector or transport and storage sector, working in the business service sector or catering sector significantly decreases the regularity of an individual of feeling happy. This could be explained with individuals experiencing more stress in white-collar sectors due to e.g. more customer contact, high expectations towards their performance or a worse company climate. Nevertheless, the exact origin of the tendency has not been determined in this paper and requires further research.

The third hypothesis, which aims to answer the research question, states that the number of working hours has a stronger effect on the mental health of white-collar sector workers compared to blue-collar sector workers. To analyze this hypothesis, the individual fixed-effects regressions, as according to the methodology section, have been run separately on the individuals in the sample who work in blue-collar sectors and on the ones working in white-collar sectors. In the last paragraph of the data section, it has been outlined which sectors count towards the blue-collar or white-collar sectors. The working hours had no significant correlation with the frequency of feeling anxious for blue-collar or white-collar workers (see Table 14, Model 4 and Model 1). While the regularity of feeling anxious was positively driven by having a handicap and having obtained high values of anxiety before for the blue-collar workers, it has been driven negatively by the partner's health and positively by having a paid job and being on parental leave for white-collar workers. Also for the frequency of feeling down, the working hours are no significant driver for both sectors (see Appendix B, Table 15, Model 1 and Model 4). Only an increasing health of the partner caused a lower frequency of feeling down for blue-collar workers, while being a widow and having reported high previous values of feeling down decreased the frequency of feeling down for white-collar workers. Living in an urban area, in turn, increased their regularity of feeling down. For being peaceful, no used variable has been determined to have an effect on the frequency for blue-collar workers. For white-collar workers, a handicap, being on parental leave, receiving an education and previously high regularities of feeling peaceful decreased the current frequency of feeling peaceful (see Appendix B, Table 16, Model 1 and Model 4). Being depressed has been found to be negatively driven by the urbanity of the living area and the health of the partner for blue-collar workers (see Appendix B, Table 17, Model 1) and negatively driven by high reported frequencies of feeling depressed in the previous year for white-collar workers. Furthermore, urbanity increased their frequency of feeling depressed (see Appendix B, Table 17, Model 4). The frequency of feeling happiness has been negatively driven by the urbanity of the living area and

positively driven by the health of the partner for blue-collar individuals (see Appendix B, Table 18, Model 1). Being separated, having one or two kids and having a handicap have been found as negative drivers of feeling happiness for white-collar workers, while the health of the partner positively affects their happiness (Appendix B, Table 18, Model 1).

It becomes evident, that none of the previously mentioned regression models found a significant correlation between the working hours of an individual and the variables determining mental health, when being performed separately per working sector. Therefore, also the third hypothesis, stating that the mental health of workers in white-collar sectors is affected more than the ones of blue-collar sector workers by the working hours, has to be rejected. Nevertheless, while the relevant factors driving mental health vary widely per measure and sector, workers of both sectors experience better mental health if the general health of their partner is higher.

After investigating all three hypotheses, the following research question remains to be answered:

To what extent does the quantity of working hours influence the general and mental health of individuals in the Netherlands?

By taking all three hypotheses into account, I arrive at the conclusion that the quantity of working hours does not, on average, influence the general and mental health of individuals living in the Netherlands. Only for men, a decrease in the level of anxiety can be achieved with a higher quantity of working hours. Those conclusions indicate that increased working hours cannot generally be seen to come at the cost of the general and mental health in the Netherlands. Also, the high percentage of Dutch women performing part-time work (OECD, 2018) cannot be attributed to an urge of maximizing the mental and general health. The high percentage of the population working part-time can be rather attributed to other factors. As suggestions for further research, the effect of the working conditions, self-employment or pay-for-performance on the mental and general health could be investigated. Furthermore, the findings by using the working hours as a continuous variable could be contrasted with findings obtained when splitting the number of working hours into binary variables, as done by Booth & Van Ours (2008). This approach has not been followed in this paper due to the low variation in working hours which led to an insignificant amount of changes across groups, which are needed to arrive at an internally valid model (Booth & Van Ours, 2008; Booth & Van Ours, 2009). Also, interaction effects of variables and a non-

linear behavior of control variables have not been investigated. Further research could also include interaction effects of e.g. working hours and age.

Lastly, possible problems with the methodology of the paper will be discussed. Since all of the health variables were observed in November and December of a year, while the work and schooling variables were observed in April and May, the possibility of reverse causality, which would make the conclusion of a causation invalid, can be excluded. Reverse causality, in this case, would mean that the health variables, e.g. the general health of an individual or feeling anxious, were influencing the work and schooling variables, e.g. the working hours of an individual in the same year. This in turn would lead to a high correlation of working hours and the health outcomes, which would be driven by a causation reversed of the one investigated. Furthermore, to remove a bias of previous health states on the current working hours, the first lagged health value of each health measure has been introduced and partly also been shown as significant, as explained before. Therefore, as previously stated, reversed causality is not a concern for the findings in this paper.

The research is, nevertheless, also subject to multiple limitations. The first one is that all the data is self-reported by the Dutch participants of the panel. It does seem unlikely that the participants fear negative consequences for reporting certain answers since their results are treated anonymously by the foundation CentERdata and not reported to employers. Nevertheless, participants might not be very careful with their answers to save time. Additionally, they might often also not know all the information, including e.g. their exact household income, which is the sum of the income of all household members. These might be possible explanations for the insignificance of multiple control variables. Additionally, as the number of control variables increased in the used models, also more observations of individuals have been dropped due to missing values. One must keep in mind that the observations only represent a part of the randomly drawn sample from the Dutch population, decreasing the internal validity of the results (Khandker, Koolwal & Samad, 2010). Moreover, the results found in this study cannot be extrapolated to other settings than the one where this study has been conducted. While the method of individual fixed-effects is strongly internally valid, the external validity is relatively low (Khandker, Koolwal & Samad, 2010). As already noted in the data section, the initial sample has been randomly drawn from the Dutch population and invited for the participation in the surveys. The findings do thereby only apply to the Netherlands.

VIII. References

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IX. Appendix A – Additional Data

Table 1. Descriptive Statistics with Renamed and Binary Variables

Variable	Observations	Mean	Std. Dev.	Min	Max
Dependent Variables					
general health	28,172	3.105814	.7813262	1	5
general health compared to t-1	28,166	2.94994	.6721202	1	5
anxious	28,135	2.101546	1.015744	1	6
down	28,135	1.670624	.956223	1	6
peaceful	28,135	4.242118	1.101204	1	6
depressed	28,135	2.022641	1.02698	1	6
happy	28,135	4.256087	1.073603	1	6
Independent Variable					
working hours	17,799	29.65948	15.78679	0	150
Control Variables					
net household income	48,513	3193.284	3631.103	0	346998
age	26,619	51.44115	17.70393	16	100
paid	29,550	.5553976	.49693	0	1
female	26,619	.5366843	.4986618	0	1
urban	53,718	.628039	.4833326	0	1
parental leave	54,182	.0056845	.075182	0	1
handicap	28,154	.3191731	.4661645	0	1
Civil Status					
married	54,182	.4445019	.496915	0	1
separated	54,182	.0034882	.0589588	0	1
divorced	54,182	.0654092	.2472488	0	1
widow	54,182	.0358606	.1859443	0	1
Sector of Work					
agricultural sector	17,642	.0198957	.1396459	0	1
mining sector	17,642	.0006802	.0260724	0	1
industrial sector	17,642	.0872917	.28227	0	1
production sector	17,642	.0105997	.1024107	0	1
construction sector	17,642	.0386577	.1927834	0	1
retail & trade sector	17,642	.0820769	.2744896	0	1
catering sector	17,642	.0428523	.2025297	0	1
transport & storage sector	17,642	.0463099	.2101614	0	1
financial sector	17,642	.0442694	.2056988	0	1
business service sector	17,642	.0660356	.2483513	0	1
governmental sector	17,642	.0856479	.2798513	0	1
educational sector	17,642	.0875751	.282684	0	1
health sector	17,642	.1974266	.3980682	0	1
environmental & cultural sector	17,642	.0249405	.1559482	0	1
Education Level					
primary education	29,549	.0394599	.1946897	0	1
middle school education	29,549	.2630207	.440281	0	1
secondary school education	29,549	.2841721	.4510268	0	1
post-secondary education	29,549	.1099868	.3128786	0	1
tertiary education	29,549	.2475211	.4315793	0	1
post-tertiary education	29,549	.019493	.1382524	0	1
other education	29,549	.0280551	.1651331	0	1
one child	54,182	.1356355	.3424042	0	1
two children	54,182	.262578	.440039	0	1
three children	54,182	.1214241	.3266225	0	1
four children	54,182	.0242885	.1539448	0	1
five children	54,182	.009302	.095998	0	1
six children	54,182	.0016242	.0402684	0	1
seven children	54,182	.0001661	.0128873	0	1
Partner					
health	16,419	3.096595	.7657391	1	5
working hours	9,732	29.79429	15.75377	0	150
Year					
year 2013	54,182	.1820162	.3858614	0	1
year 2015	54,182	.2055849	.4041321	0	1
year 2016	54,182	.1866487	.3896329	0	1
year 2017	54,182	.2113986	.4083042	0	1

Table 2. Descriptive Statistics with Renamed and Binary Variables After Removing Single-Wave Individuals

Variable	Observations	Mean	Std. Dev.	Min	Max
Dependent Variables					
general health	27,048	3.104518	.780098	1	5
general health compared to t-1	27,042	2.946602	.6686792	1	5
anxious	27,012	2.087813	1.01318	1	6
down	27,012	1.664149	.9540004	1	6
peaceful	27,012	4.249037	1.101689	1	6
depressed	27,012	2.01503	1.025821	1	6
happy	27,012	4.259884	1.074983	1	6
Independent Variable					
working hours	17,111	29.56735	15.80913	0	150
Control Variables					
net household income	44,140	3186.38	3162.629	0	240000
age	25,564	51.61583	17.65681	16	98
paid	28,492	.5536993	.4971167	0	1
female	25,564	.5343452	.4988288	0	1
urban	48,859	.622526	.4847599	0	1
parental leave	49,233	.0060122	.0773059	0	1
handicap	27,033	.3194984	.4662909	0	1
Civil Status					
married	49,233	.4565434	.498113	0	1
separated	49,233	.0034123	.0583161	0	1
divorced	49,233	.0655455	.2474884	0	1
widow	49,233	.0360124	.1863229	0	1
Sector of Work					
agricultural sector	16,975	.0202062	.1407091	0	1
mining sector	16,975	.000648	.0254486	0	1
industrial sector	16,975	.0880707	.283406	0	1
production sector	16,975	.0104271	.1015824	0	1
construction sector	16,975	.0382916	.191905	0	1
retail & trade sector	16,975	.0817673	.2740179	0	1
catering sector	16,975	.0420029	.2006018	0	1
transport & storage sector	16,975	.0462445	.2100203	0	1
financial sector	16,975	.0441237	.205376	0	1
business service sector	16,975	.0663328	.2488703	0	1
governmental sector	16,975	.0857732	.2800371	0	1
educational sector	16,975	.0879529	.2832347	0	1
health sector	16,975	.1978203	.3983677	0	1
environmental & cultural sector	16,975	.0250368	.1562415	0	1
Education Level					
primary education	28,491	.0395914	.1950008	0	1
middle school education	28,491	.263592	.4405883	0	1
secondary school education	28,491	.2850023	.4514235	0	1
post-secondary education	28,491	.1096136	.312413	0	1
tertiary education	28,491	.2466744	.4310831	0	1
post-tertiary education	28,491	.0195851	.1385721	0	1
other education	28,491	.0275175	.1635885	0	1
Children					
one child	49,233	.1323299	.3388526	0	1
two children	49,233	.2639287	.4407656	0	1
three children	49,233	.1224991	.3278647	0	1
four children	49,233	.0225052	.1483212	0	1
five children	49,233	.0092215	.0955856	0	1
six children	49,233	.0014827	.0384783	0	1
seven children	49,233	0	0	0	1
Partner					
health	15,882	3.094132	.7649306	1	5
working hours	9,349	29.69237	15.77253	0	150
Year					
year 2013	49,233	.1992363	.3994301	0	1
year 2015	49,233	.2136981	.4099203	0	1
year 2016	49,233	.204822	.4035756	0	1
year 2017	49,233	.1846323	.3880029	0	1

Table 3. Descriptive Statistics with Renamed and Binary Variables After Removing Single-Wave Individuals and Non-Respondents of the Work & Schooling and Health Panel

Variable	Observations	Mean	Std. Dev.	Min	Max
Dependent Variables					
general health	27,048	3.104518	.780098	1	5
general health compared to t-1	27,042	2.946602	.6686792	1	5
anxious	27,012	2.087813	1.01318	1	6
down	27,012	1.664149	.9540004	1	6
peaceful	27,012	4.249037	1.101689	1	6
depressed	27,012	2.01503	1.025821	1	6
happy	27,012	4.259884	1.074983	1	6
Independent Variable					
working hours	17,111	29.56735	15.80913	0	150
Control Variables					
net household income	26,645	3018.539	3236.294	0	183934
age	25,564	51.61583	17.65681	16	98
paid	27,530	.5703596	.4950338	0	1
female	25,564	.5343452	.4988288	0	1
urban	29,103	.6341271	.4816824	0	1
parental leave	29,310	.0100989	.0999865	0	1
handicap	27,033	.3194984	.4662909	0	1
Civil Status					
married	29,310	.5443535	.4980374	0	1
separated	29,310	.0041624	.0643834	0	1
divorced	29,310	.0913681	.2881368	0	1
widow	29,310	.0523712	.2227783	0	1
Sector of Work					
agricultural sector	16,972	.0202098	.1407213	0	1
mining sector	16,972	.0006481	.0254508	0	1
industrial sector	16,972	.0880863	.2834287	0	1
production sector	16,972	.0104289	.1015913	0	1
construction sector	16,972	.0382984	.1919213	0	1
retail & trade sector	16,972	.0817228	.2739501	0	1
catering sector	16,972	.0420104	.2006187	0	1
transport & storage sector	16,972	.0462527	.210038	0	1
financial sector	16,972	.0440726	.2052625	0	1
business service sector	16,972	.0663446	.2488908	0	1
governmental sector	16,972	.0857884	.2800595	0	1
educational sector	16,972	.0879684	.2832573	0	1
health sector	16,972	.1977964	.3983495	0	1
environmental & cultural sector	16,972	.0250412	.156255	0	1
Education Level					
primary education	27,529	.0381416	.1915415	0	1
middle school education	27,529	.2607432	.4390481	0	1
secondary school education	27,529	.2854808	.4516513	0	1
post-secondary education	27,529	.1110829	.3142404	0	1
tertiary education	27,529	.2493007	.4326161	0	1
post-tertiary education	27,529	.0196883	.1389295	0	1
other education	27,529	.027244	.1627966	0	1
Children					
one child	29,310	.1230297	.3284769	0	1
two children	29,310	.1953941	.3965105	0	1
three children	29,310	.0761174	.2651903	0	1
four children	29,310	.0131013	.1137107	0	1
five children	29,310	.0059707	.0770403	0	1
six children	29,310	.0008188	.028604	0	1
Partner					
health	13,597	3.087593	.7644209	1	5
working hours	7,903	29.9504	15.82514	0	150
Year					
year 2013	29,310	.1978506	.3983857	0	1
year 2015	29,310	.2161037	.4115929	0	1
year 2016	29,310	.2008188	.4006197	0	1
year 2017	29,310	.1799727	.3841713	0	1

Table 4. Descriptive Statistics with Renamed and Binary Variables After Removing Single-Wave Individuals and Non-Respondents of the Work & Schooling and Health Panel

Variable	Observations	Mean	Std. Dev.	Min	Max
Dependent Variables					
general health	17,978	3.160474	.783587	1	5
general health compared to t-1	17,973	2.985144	.6609448	1	5
anxious	17,948	2.1155	1.026358	1	6
down	17,948	1.688378	.976805	1	6
peaceful	17,948	4.197069	1.094111	1	6
depressed	17,948	2.054546	1.04753	1	6
happy	17,948	4.22593	1.079883	1	6
Independent Variable					
working hours	13,085	30.29545	15.42972	0	150
Control Variables					
net household income	16,121	3088.028	1908.935	0	133537
age	17,978	44.55868	13.33347	18	64
paid	16,678	.7334812	.4421518	0	1
female	17,978	.5542886	.4970578	0	1
urban	17,836	.6470061	.4779142	0	1
parental leave	17,978	.0119591	.1087046	0	1
handicap	17,968	.2740427	.446043	0	1
Civil Status					
married	17,978	.534431	.498827	0	1
separated	17,978	.0043943	.0661452	0	1
divorced	17,978	.0930582	.290522	0	1
widow	17,978	.0160752	.1257683	0	1
Sector of Work					
agricultural sector	13,000	.0188462	.1359868	0	1
mining sector	13,000	.0005385	.0231994	0	1
industrial sector	13,000	.0933846	.2909819	0	1
production sector	13,000	.0101538	.1002573	0	1
construction sector	13,000	.0388462	.1932356	0	1
retail & trade sector	13,000	.0813077	.2733176	0	1
catering sector	13,000	.0372308	.1893341	0	1
transport & storage sector	13,000	.0441538	.2054447	0	1
financial sector	13,000	.0445385	.2062961	0	1
business service sector	13,000	.0668462	.249765	0	1
governmental sector	13,000	.0901538	.2864131	0	1
educational sector	13,000	.09	.2861928	0	1
health sector	13,000	.2047692	.4035484	0	1
environmental & cultural sector	13,000	.0255385	.1577598	0	1
Education Level					
primary education	16,677	.020927	.1431444	0	1
middle school education	16,677	.2104695	.4076543	0	1
secondary school education	16,677	.3327337	.4712062	0	1
post-secondary education	16,677	.1325778	.339128	0	1
tertiary education	16,677	.2561012	.4364915	0	1
post-tertiary education	16,677	.0198477	.1394809	0	1
other education	16,677	.0206272	.142137	0	1
Children					
one child	17,978	.1595839	.3662299	0	1
two children	17,978	.2482479	.4320084	0	1
three children	17,978	.0947825	.2929224	0	1
four children	17,978	.015519	.1236082	0	1
five children	17,978	.006508	.0804112	0	1
six children	17,978	.0011125	.0333361	0	1

Table 4. Continued

Partner					
health	8,500	3.156471	.7752415	1	5
working hours	6,253	30.25972	15.68641	0	150
Year					
year 2013	17,978	.2144844	.4104756	0	1
year 2015	17,978	.1708199	.376362	0	1
year 2016	17,978	.2062521	.4046249	0	1
year 2017	17,978	.1734898	.3786807	0	1

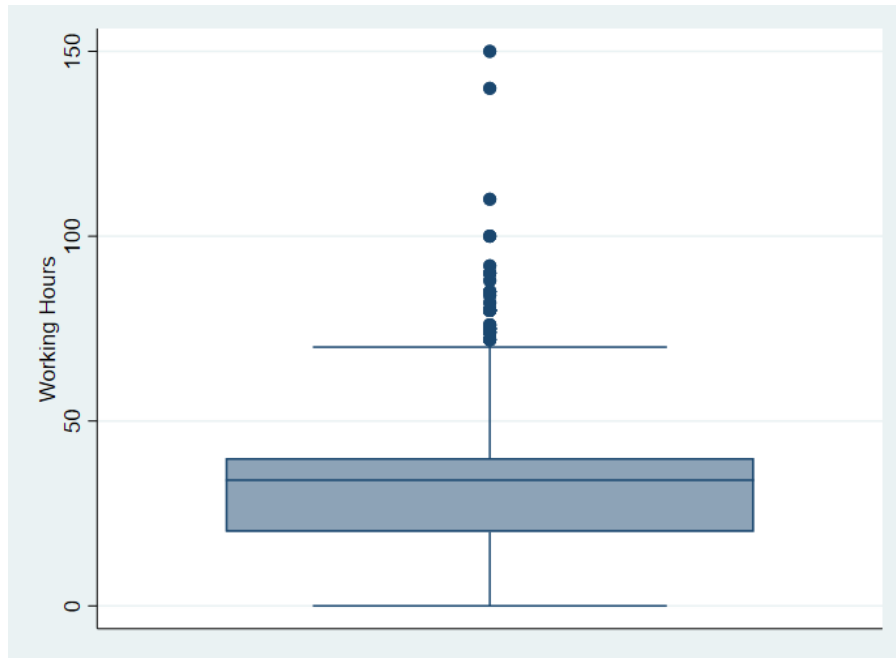


Figure 1. Box Plot of the Working Hours Corresponding to Table 4

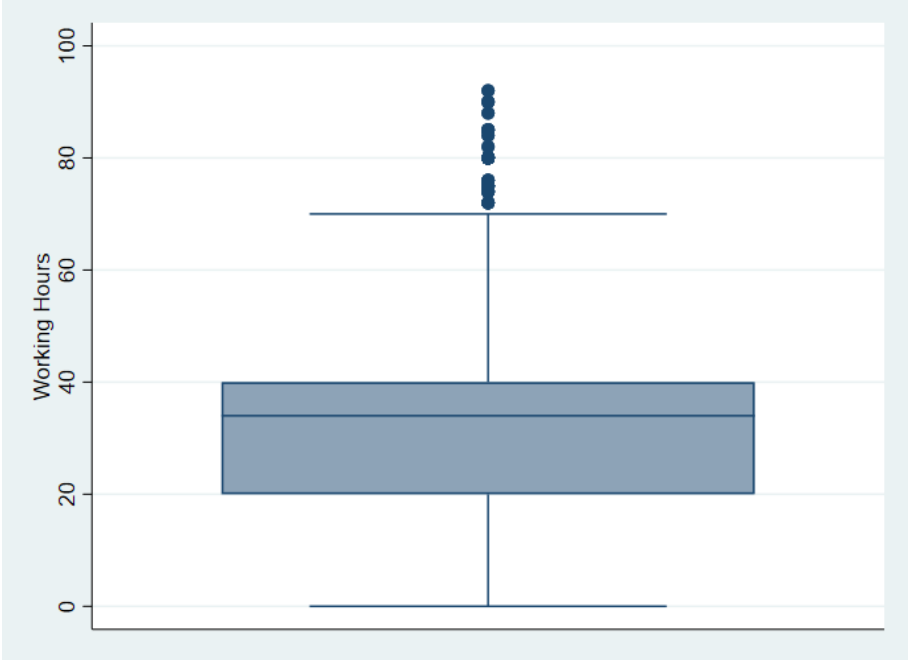


Figure 2. Box Plot of the Working Hours from the Final Corrected Data Set

X. Appendix B – Additional Results

Table 7. Individual Fixed-Effects Regressions of the General Health Compared to the Previous Year on the Working Hours and Working Hours²

Variable	General Health Compared to t-1		
	Model 1	Model 2	Model 3
Independent Variables			
working hours	.0040262 (.0032344)	.0038182 (.0032474)	.0026048 (.0054915)
working hours ²	-.0001112** (.0000627)	-.000108** (.000063)	-.000101 (.0001036)
Control Variables			
net household income	4.98e-06 (.0000212)	9.27e-06 (.0000214)	-.0000155 (.000037)
age	-.0646407 (.0460412)	-.0658443 (.0463582)	-.3304915*** (.1515621)
paid	-.0703511 (.0584018)	-.0644991 (.0587472)	-.0540331 (.1203574)
urban	.2425445 (.184494)	.2274251 (.186335)	-.5108285 (.4500188)
parental leave	-.0138211 (.1054865)	-.0116916 (.1057778)	-.1026957 (.1686373)
handicap	-.3982045*** (.0642451)	-.3904047*** (.0648062)	-.4545699*** (.1046237)
Civil Status			
married	-.0693725 (.1164316)	-.0737233 (.1167533)	-.2165002 (.2382899)
separated	-.5212745 (.4160021)	-.5367199 (.4178379)	(omitted)
divorced	-.1962339 (.1828442)	-.1986225 (.1832985)	-.4375944 (.3522672)
widow	.1849288 (.3471275)	.2015929 (.3555578)	-.3820916 (.6016585)
Sector of Work			
agricultural sector	-	.2573237 (.3686229)	.1495626 (.8376999)
mining sector	-	(omitted)	(omitted)
industrial sector	-	.113095 (.1630453)	.2994589 (.2800138)
production sector	-	.714932*** (.286771)	1.195293*** (.5770631)
construction sector	-	.1449266 (.2379216)	.0251336 (.4734848)
retail & trade sector	-	-.0326797 (.1370726)	-.4594963* (.3086478)
catering sector	-	.0319702 (.1903513)	.431878 (.4562056)
transport & storage sector	-	-.0217021 (.1696174)	.2407972 (.3198896)
financial sector	-	-.141086 (.2040153)	-.3502941 (.4527076)
business service sector	-	.0478971 (.1422469)	-.1069494 (.2551927)
governmental sector	-	-.0459415 (.1770044)	.2663315 (.4167384)

Table 7. Continued

educational sector	-	.0558363 (.2094144)	.7269666** (.4146603)
health sector	-	.1128761 (.1319002)	-.0839576 (.2331529)
environmental & cultural sector	-	.1432818 (.1891853)	-.7769993* (.4796545)
Education Level			
Primary education	-.3824572 (.4754126)	-.3827376 (.486494)	-.9923437 (.8452938)
Middle school education	-.0077708 (.3808953)	-.0101576 (.394756)	-.6272739 (.6772726)
Secondary school education	-.0312494 (.3877859)	-.0332933 (.4006917)	-.6908295 (.6903421)
Post-secondary education	.0938493 (.3890993)	.0889743 (.4021487)	-.5639985 (.6843079)
Tertiary education	.0767072 (.3903431)	.06929 (.4030645)	-.5318672 (.6840217)
Post-tertiary education	.0994862 (.3999967)	.0956391 (.4122543)	-.5095913 (.6988007)
Other education	.1507997 (.4057891)	.1447278 (.4176994)	-.4256511 (.7080348)
Children			
one child	-.0882253 (.0678557)	-.0906683 (.0693734)	.0657301 (.1227965)
two children	-.0762845 (.0893484)	-.0763525 (.0899759)	.0338882 (.1576006)
three children	-.1379297 (.1427776)	-.1451446 (.1432603)	.2106902 (.2627179)
four children	-.4157047** (.2438406)	-.4017043* (.2445051)	-.0009477 (.3905542)
five children	-.823451*** (.3587556)	-.837554*** (.3587897)	-.6134253 (.4531633)
six children	(omitted)	(omitted)	(omitted)
Partner			
health	.1447485*** (.0199013)	.1428142*** (.0200453)	.1448271*** (.0346034)
working hours	.0000989 (.0010212)	.0001406 (.0010269)	.0007354 (.001809)
Year			
year 2013	.0188141 (.0518943)	.0196623 (.0522504)	-1.261044*** (.6059284)
year 2015	.2096338** (.1257182)	.2118981** (.1264898)	(omitted)
year 2016	.1571728 (.1867416)	.1648995 (.1878439)	-.3545698*** (.1491608)
year 2017	.2621064 (.2290967)	.264566 (.2306626)	(omitted)
general health lag (t-1)	-	-	-.1294194*** (.0487566)
constant	5.572594*** (2.141533)	5.580723*** (2.162086)	20.89963*** (7.722483)
Observations	4,905	4,866	2,309
Number of Individuals	2,374	2,355	1,538

Standard errors given in parentheses (); *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

Table 10. Individual Fixed-Effects Regressions of Frequency of Feeling Down on the Working Hours and Working Hours²

Variable	Down		
	Model 1	Model 2	Model 3
Independent Variables			
working hours	.0021883 (.0038245)	.0027566 (.0038449)	.001697 (.0070457)
working hours ²	-.0000417 (.0000741)	-.000053 (.0000746)	-.0000388 (.0001329)
Control Variables			
net household income	.0000107 (.0000251)	9.45e-06 (.0000254)	.0000359 (.0000475)
age	-.022627 (.0544478)	-.0142097 (.0548865)	-.2102858 (.1944235)
paid	-.0526092 (.0692972)	-.0441212 (.0698131)	.0964845 (.1531763)
urban	-.0529919 (.2181326)	-.0286509 (.2205701)	1.401348*** (.5762108)
parental leave	.0424631 (.1247199)	.0275886 (.1252102)	.0966201 (.2160178)
handicap	.1599841*** (.0759593)	.1593914*** (.076712)	.040132 (.1337963)
Civil Status			
married	.0086966 (.1376651)	.0112631 (.1382038)	-.1190962 (.3057345)
separated	.9173972** (.4918515)	.9758474*** (.4946074)	(omitted)
divorced	.1675964 (.2161878)	.1750918 (.2169776)	.2052017 (.4521267)
widow	-.2214117 (.4104288)	-.2832166 (.4208983)	-1.13135* (.7732824)
Sector of Work			
agricultural sector	-	-.075806 (.4363797)	.3196353 (1.074286)
mining sector	-	(omitted)	(omitted)
industrial sector	-	-.0343155 (.1930871)	-.4122881 (.3592172)
production sector	-	.3987192 (.3394794)	-.0212468 (.7383205)
construction sector	-	.0309042 (.281697)	-.101677 (.6076181)
retail & trade sector	-	.1972742 (.1623694)	.2716429 (.3953841)
catering sector	-	.3955882** (.2254089)	-.5709872 (.5851948)
transport & storage sector	-	-.3186818* (.2008571)	-.7454436** (.410206)
financial sector	-	.1014779 (.2415726)	-.4752586 (.5806894)
business service sector	-	-.1368013 (.1685761)	-.735926*** (.3276707)
governmental sector	-	.0944572 (.2096832)	-.3583469 (.5341813)
educational sector	-	.1308316 (.2481608)	-.255029 (.5323356)

Table 10. Continued

health sector	-	-.3042772** (.1590793)	-.2698101 (.2984438)
environmental & cultural sector	-	-.3771833** (.2240666)	-.2315361 (.6166355)
Education Level			
Primary education	.2495495 (.5620988)	.1458328 (.575868)	-.1025985 (1.084642)
Middle school education	.1551792 (.4503468)	.0474021 (.4672764)	1.413833* (.8687744)
Secondary school education	.0919241 (.4584977)	.0038846 (.4743043)	1.053747 (.8855361)
Post-secondary education	.197927 (.460044)	.1116296 (.4760297)	1.118703 (.8778655)
Tertiary education	.189412 (.4615266)	.1010285 (.4771129)	1.100115 (.8774933)
Post-tertiary education	.0413024 (.4729365)	-.0581162 (.4879901)	1.244544 (.8963478)
Other education	.1959088 (.4797859)	.0800709 (.4944365)	1.610473** (.9080953)
Children			
one child	.1164461* (.0802282)	.1462865** (.08212)	.1013233 (.1574721)
two children	.0174989 (.1056395)	.0396758 (.1065061)	.0052585 (.2018039)
three children	-.1444714 (.1688114)	-.1218263 (.1695798)	-.2678459 (.3372292)
four children	.6189871*** (.2883012)	.6223704*** (.2894252)	.8337211** (.5012337)
five children	.4539775 (.4241683)	.4826288 (.4247028)	.7428948 (.5807575)
six children	(omitted)	(omitted)	(omitted)
Partner			
health	-.0867687*** (.0235437)	-.0864121*** (.0237421)	-.0640288 (.0444912)
working hours	.0013801 (.0012085)	.0015168 (.0012166)	.002031 (.0023203)
Year			
year 2013	.0017323 (.0613872)	-.0034997 (.0618795)	-.8094579 (.7772849)
year 2015	-.0284158 (.1486566)	-.037616 (.1497439)	(omitted)
year 2016	.0639069 (.2208518)	.044729 (.222415)	-.1782939 (.1913467)
year 2017	.0362745 (.2709244)	.012209 (.2730946)	(omitted)
down lag (t-1)	-	-	-.0702032** (.0415922)
constant	2.647302 (2.532779)	2.357433 (2.560134)	10.44522 (9.906328)
Observations	4,901	4,862	2,304
Number of Individuals	2,374	2,355	1,533

Standard errors given in parentheses (); *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

Table 11. Individual Fixed-Effects Regressions of Frequency of Feeling Peaceful on the Working Hours and Working Hours²

Variable	Peaceful		
	Model 1	Model 2	Model 3
Independent Variables			
working hours	.0011643 (.0046345)	.0003287 (.0046535)	-.0037584 (.0081146)
working hours ²	-5.29e-06 (.0000898)	.0000154 (.0000903)	-.0000118 (.0001531)
Control Variables			
net household income	.0000167 (.0000304)	.0000139 (.0000307)	-.0000783 (.0000547)
age	-.0080642 (.0659799)	-.0115679 (.06643)	.1528723 (.2248094)
paid	-.0470958 (.0839746)	-.0592537 (.0844959)	.1903236 (.1764475)
urban	.4434658** (.2643337)	.436137* (.2669596)	1.903504*** (.6669364)
parental leave	-.1718409 (.1511359)	-.1742984 (.1515438)	-.3861994* (.2488457)
handicap	-.1844779*** (.0920477)	-.1912794*** (.0928457)	-.3130602*** (.1540447)
Civil Status			
married	-.0404856 (.1668229)	-.0297469 (.1672702)	-.1552535 (.3521254)
separated	-.1908739 (.5960269)	-.1829379 (.5986313)	(omitted)
divorced	-.2698978 (.2619769)	-.2687777 (.2626114)	-.2440122 (.5212552)
widow	-.1250235 (.4973586)	.0255665 (.5094199)	.1904006 (.8891555)
Sector of Work			
agricultural sector	-	1.090578*** (.5281573)	4.76311*** (1.237584)
mining sector	-	(omitted)	(omitted)
industrial sector	-	.2372414 (.2336964)	.7873594** (.4137078)
production sector	-	.2406948 (.4108774)	1.442996** (.8504704)
construction sector	-	-.1597361 (.3409423)	1.95705*** (.6997119)
retail & trade sector	-	-.0148563 (.1965182)	.8744321** (.4556199)
catering sector	-	-.6110162** (.272816)	.1240498 (.6739918)
transport & storage sector	-	.6836476*** (.2431006)	1.372264*** (.4734826)
financial sector	-	.0088724 (.2923792)	-.7678074 (.6695977)
business service sector	-	-.0820476 (.2040303)	.0282367 (.3768786)
governmental sector	-	.0090275 (.253783)	.9084017* (.6152482)
educational sector	-	-.1397125 (.300353)	-.2547197 (.6127041)

Table 11. Continued

health sector	-	.2009201 (.1925363)	-.0796679 (.3437008)
environmental & cultural sector	-	-.0216273 (.2711914)	.3380422 (.7082868)
Education Level			
Primary education	-.4100196 (.6811528)	-.1339641 (.6969823)	-.855739 (1.249572)
Middle school education	-.9424955** (.5457314)	-.6608526 (.5655521)	-1.113038 (1.001917)
Secondary school education	-1.083872** (.5556087)	-.831003* (.5740581)	-1.261856 (1.023577)
Post-secondary education	-1.052071** (.5574826)	-.8249369 (.5761464)	-1.03522 (1.014817)
Tertiary education	-1.07242** (.5592792)	-.8478957* (.5774574)	-1.095372 (1.014025)
Post-tertiary education	-1.039051** (.5731057)	-.802356 (.5906222)	-1.174523 (1.035354)
Other education	-1.097478** (.5814058)	-.8406475 (.5984244)	-1.522905* (1.048486)
Children			
one child	.028822 (.0972207)	.0210483 (.0993911)	.1592611 (.1819055)
two children	-.0437683 (.1280142)	-.0444506 (.128906)	-.0331093 (.2329731)
three children	-.0310092 (.2045661)	-.0171785 (.2052451)	.6200911* (.3886997)
four children	-.108161 (.3493642)	-.114855 (.3502959)	.3066521 (.5768786)
five children	-.3488214 (.5140083)	-.321469 (.5140246)	.0415963 (.6685658)
six children	(omitted)	(omitted)	(omitted)
Partner			
health	.0896518*** (.0285304)	.0841013*** (.0287354)	.0600385 (.0510962)
working hours	-.0045428*** (.0014644)	-.0047587*** (.0014725)	-.0049649** (.0026755)
Year			
year 2013	-.106295 (.0743892)	-.1053483 (.0748938)	.4800988 (.8983597)
year 2015	.011351 (.1801424)	.0071573 (.1812375)	(omitted)
year 2016	.0243757 (.2676288)	.0264693 (.2691924)	.1391448 (.2211686)
year 2017	.0458507 (.3283068)	.0451373 (.3305308)	(omitted)
peaceful lag (t-1)	-	-	-.1353137*** (.0391151)
constant	5.357478** (3.069228)	5.240564** (3.098571)	-2.938971 (11.48535)
Observations	4,901	4,862	2,304
Number of Individuals	2,374	2,355	1,533

Standard errors given in parentheses (); *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

Table 12. Individual Fixed-Effects Regressions of Frequency of Feeling Depressed on the Working Hours and Working Hours²

Variable	Depressed		
	Model 1	Model 2	Model 3
Independent Variables			
working hours	.0063485* (.00406)	.0063464* (.004085)	.002825 (.0074443)
working hours ²	-.0000976 (.0000787)	-.0000967 (.0000792)	-.0000649 (.0001404)
Control Variables			
net household income	.0000354 (.0000266)	.0000378 (.000027)	.0000375 (.0000502)
age	-.036965 (.0577999)	-.0383579 (.0583141)	.0198168 (.2056607)
paid	-.0750521 (.0735636)	-.068251 (.0741729)	-.0875955 (.1623121)
urban	-.2635105 (.2315623)	-.2777707 (.2343445)	.5377273 (.6097322)
parental leave	.0754891 (.1323985)	.0719586 (.1330294)	.1839049 (.2285131)
handicap	.0770146 (.0806359)	.0675195 (.0815025)	.0153365 (.1413529)
Civil Status			
married	-.1781947 (.1461407)	-.1669119 (.1468344)	-.4120885 (.3232068)
separated	.5172993 (.5221331)	.4955924 (.525495)	(omitted)
divorced	-.211837 (.2294977)	-.1899293 (.2305276)	-.0281974 (.4782928)
widow	-.2427794 (.4356975)	-.2959294 (.4471829)	-.8823814 (.8155556)
Sector of Work			
agricultural sector	-	.1011492 (.4636311)	1.275683 (1.136138)
mining sector	-	(omitted)	(omitted)
industrial sector	-	.0793255 (.2051451)	-.2238864 (.3797699)
production sector	-	-.7021615** (.3606795)	-.5920427 (.7827372)
construction sector	-	.1486692 (.2992886)	-.7117364 (.6420194)
retail & trade sector	-	.1431709 (.1725091)	.1030453 (.4179488)
catering sector	-	.4376043** (.2394854)	-.4594656 (.6215)
transport & storage sector	-	-.0636584 (.2134004)	.0711596 (.4338259)
financial sector	-	.0751679 (.2566585)	-.6914403 (.6142812)
business service sector	-	.0939908 (.1791035)	-.0813025 (.3468727)
governmental sector	-	-.0952189 (.2227777)	-.1148622 (.5644412)
educational sector	-	.2676027 (.2636582)	.5146779 (.5624228)

Table 12. Continued

health sector	-	-.0065344 (.1690136)	.1871378 (.3152408)
environmental & cultural sector	-	.0342287 (.2380593)	.8250177 (.6498059)
Education Level			
Primary education	.3907747 (.5967053)	.2399968 (.6118302)	.000265 (1.146014)
Middle school education	.5170335 (.4780731)	.3575195 (.4964572)	.493586 (.9181022)
Secondary school education	.5007537 (.4867259)	.3766004 (.503924)	.4214869 (.9359023)
Post-secondary education	.5426925 (.4883674)	.4253903 (.5057572)	.3714661 (.9276309)
Tertiary education	.5385054 (.4899413)	.4268215 (.506908)	.3756027 (.9272313)
Post-tertiary education	.4789579 (.5020536)	.3614594 (.5184644)	.4192348 (.9472675)
Other education	.6441293 (.5093247)	.5159553 (.5253135)	.6902415 (.9597266)
Children			
one child	.0269472 (.0851676)	.0180744 (.0872482)	.0143452 (.166396)
two children	-.0346547 (.1121434)	-.042299 (.1131573)	.2570427 (.2131649)
three children	-.3318556** (.1792046)	-.335798** (.1801698)	-.3134219 (.3561882)
four children	.3591762 (.306051)	.3614173 (.3074994)	.6857256 (.5292676)
five children	.3299506 (.450283)	.3164789 (.4512249)	.6390475 (.6136746)
six children	(omitted)	(omitted)	(omitted)
Partner			
health	-.0794133*** (.0249933)	-.0792953*** (.0252247)	-.0630948 (.0468753)
working hours	.0007047 (.0012829)	.000883 (.0012926)	-.0013789 (.0024534)
Year			
year 2013	.0005469 (.0651666)	.0039455 (.0657438)	.1095376 (.8222401)
year 2015	.0056808 (.1578089)	.0112672 (.1590953)	(omitted)
year 2016	.1169344 (.2344489)	.1241869 (.2363045)	.0739416 (.2024901)
year 2017	.0965057 (.2876043)	.1083052 (.290149)	(omitted)
down lag (t-1)	-	-	-.1436199*** (.0433985)
constant	3.520494 (2.688713)	3.639818 (2.720011)	.764966 (10.47478)
Observations	4,901	4,862	2,304
Number of Individuals	2,374	2,355	1,533

Standard errors given in parentheses (); *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

Table 13. Individual Fixed-Effects Regressions of Frequency of Feeling Happy on the Working Hours and Working Hours²

Variable	Happy		
	Model 1	Model 2	Model 3
Independent Variables			
working hours	-.0017247 (.0038868)	-.0016304 (.003907)	-.0028439 (.0068016)
working hours ²	.0000933 (.0000753)	.000098 (.0000758)	.0000595 (.0001283)
Control Variables			
net household income	-.0000327 (.0000255)	-.0000316 (.0000258)	-.0000637 (.0000459)
age	-.017155 (.0553345)	-.0098711 (.0557737)	-.0259446 (.1878045)
paid	.0151932 (.0704258)	.0062202 (.0709417)	.140208 (.1479747)
urban	.465987*** (.2216851)	.4177235** (.2241358)	2.719168*** (.5585721)
parental leave	-.1666163 (.1267511)	-.1596775 (.1272342)	-.1258483 (.2085722)
handicap	-.1568438** (.0771964)	-.1514198** (.0779521)	-.2316781** (.129067)
Civil Status			
married	.0293216 (.1399071)	.0214927 (.1404379)	.1325315 (.295054)
separated	-1.506593*** (.4998616)	-1.41626** (.502603)	(omitted)
divorced	-.1135201 (.2197085)	-.1329844 (.2204851)	-.0216915 (.4365634)
widow	-.1928305 (.4171129)	-.1844199 (.4277023)	.1276306 (.7452752)
Sector of Work			
agricultural sector	-	-.0171149 (.443434)	.280834 (1.037087)
mining sector	-	(omitted)	(omitted)
industrial sector	-	-.2591592 (.1962084)	.1572195 (.3472358)
production sector	-	-.276465 (.3449672)	1.135563* (.7125724)
construction sector	-	-.4069859 (.2862507)	.0950355 (.5864222)
retail & trade sector	-	-.1283868 (.1649941)	.4134099 (.3818266)
catering sector	-	-.5626021*** (.2290527)	-.7159615 (.5648534)
transport & storage sector	-	-.0741502 (.204104)	.2938344 (.3961016)
financial sector	-	-.1841765 (.2454777)	-.516509 (.5616009)
business service sector	-	-.3386624*** (.1713012)	.03347 (.3160901)
governmental sector	-	-.4873969** (.2130729)	-.0237063 (.5156508)
educational sector	-	-.2932107 (.2521725)	-.2641891 (.5134935)

Table 13. Continued

health sector	-	-.2659084** (.1616509)	-.5681728*** (.2879895)
environmental & cultural sector	-	.0562905 (.2276887)	-.2230709 (.5936709)
Education Level			
Primary education	-.3272906 (.5712529)	-.1172674 (.5851772)	-.6563773 (1.04731)
Middle school education	-.3465996 (.4576809)	-.1342332 (.4748301)	-.3069023 (.8398612)
Secondary school education	-.4538576 (.4659646)	-.2890669 (.4819716)	-.5472908 (.8566971)
Post-secondary education	-.4768972 (.4675361)	-.265603 (.4837249)	-.1248089 (.849949)
Tertiary education	-.4412281 (.4690429)	-.2395565 (.4848257)	-.0916453 (.8494054)
Post-tertiary education	-.2422985 (.4806386)	-.0462088 (.4958786)	.0456082 (.8674921)
Other education	-.4426002 (.4875995)	-.2314013 (.5024293)	-.51137 (.8784868)
Children			
one child	-.0470593 (.0815348)	-.0365847 (.0834475)	-.1000622 (.1520826)
two children	-.1015899 (.1073599)	-.1047142 (.1082278)	-.5374086*** (.1947355)
three children	-.1131286 (.1715606)	-.1109164 (.1723211)	.1947847 (.3253724)
four children	-.2499315 (.2929964)	-.2739263 (.2941039)	-.3334974 (.4837625)
five children	-.2184868 (.4310762)	-.1953394 (.4315683)	.0050196 (.5602783)
six children	(omitted)	(omitted)	(omitted)
Partner			
health	.1311511*** (.0239272)	.1279241*** (.0241259)	.1375428*** (.0428303)
working hours	-.0011505 (.0012282)	-.0013886 (.0012363)	-.0017965 (.00224)
Year			
year 2013	-.1123534** (.0623869)	-.1198488** (.0628798)	-.0353229 (.7505918)
year 2015	-.0175097 (.1510776)	-.0358282 (.1521646)	(omitted)
year 2016	-.0683676 (.2244485)	-.0962655 (.2260104)	-.008635 (.1847775)
year 2017	-.0340505 (.2753365)	-.0709047 (.2775093)	(omitted)
down lag (t-1)	-	-	-.0846214 (.0406403)
constant	5.090358*** (2.574027)	4.850404** (2.60152)	4.473192 (9.581852)
Observations	4,901	4,862	2,304
Number of Individuals	2,374	2,355	1,533

Standard errors given in parentheses (); *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

Table 15. Individual Fixed-Effects Regressions of Frequency of Feeling Down on the Working Hour and Working Hours², Split by Blue-collar and White-collar Sector

Variable	Down			
	Model 1 (blue-collar)	Model 4 (blue-collar)	Model 1 (white-collar)	Model 4 (white-collar)
Independent Variables				
working hours	.0114799* (.0072921)	.0041975 (.0124548)	.0005994 (.0046561)	.0028149 (.0088951)
working hours ²	-.0002422* (.0001552)	-.000137 (.0002677)	-8.36e-06 (.000086)	-5.46e-06 (.0001556)
Control Variables				
net household income	.0000336 (.0000429)	.0001775*** (.0000869)	-4.32e-06 (.0000316)	-.0000268 (.0000573)
age	.0143575 (.0924175)	-.1854099 (.2833207)	-.0649617 (.0673211)	-.2639426 (.2637179)
paid	-.1384203 (.1267318)	-.1886459 (.2917104)	.0149355 (.0848734)	.2041817 (.1791977)
urban	-.8648407* (.5676405)	-1.489853* (1.024655)	.1790317 (.2609503)	4.96426*** (.9835568)
parental leave	.2806199 (.2069194)	.297313 (.310251)	-.0392871 (.1654462)	.2044892 (.3782141)
handicap	.1530062 (.1256213)	-.0484782 (.2482274)	.195815*** (.0986453)	.0741647 (.1592748)
Civil Status				
married	-.149446 (.2581274)	.1077854 (.5057247)	.0046105 (.1692533)	-.1252781 (.4023947)
separated	.2244198 (.8987176)	(omitted)	1.238804*** (.594224)	(omitted)
divorced	-.1558899 (.341305)	-.3198201 (.6927325)	.49639 (.3254167)	.5304198 (.668807)
widow	.3633991 (1.039295)	(omitted)	-.7051242 (.5492945)	-1.973135*** (.925334)
Education Level				
Primary education	-.9115087 (1.087249)	-1.794806*** (.9065746)	.4310274 (.7270642)	(omitted)
Middle school education	-.9821557 (.9910343)	-.3454736 (.5985364)	.4876886 (.4964424)	.6707247 (.7270563)
Secondary school education	-1.069657 (1.017758)	-1.038927** (.553496)	.3859849 (.5026509)	.5423235 (.7315415)
Post-secondary education	-.8667476 (1.02088)	-.6934929 (.5304054)	.454049 (.5041792)	.5290163 (.7254959)
Tertiary education	-.6396586 (1.02302)	-.519309 (.5217703)	.3304398 (.5061079)	.3162331 (.7233796)
Post-tertiary education	-.9045841 (1.042585)	-.1616856 (.529255)	.2303901 (.5197862)	.4687327 (.755504)
Other education	-1.020532 (1.053967)	(omitted)	.5131119 (.5273248)	.9489602 (.7763564)

Table 15. Continued

Children				
one child	-.0243861 (.1368719)	-.409548 (.2884429)	.2327564*** (.1055712)	.2849517 (.199898)
two children	-.1140427 (.1716608)	-.5883162* (.3584308)	.1145416 (.146045)	.216825 (.2734728)
three children	-.2644182 (.2764021)	-1.18095*** (.5833875)	-.0515393 (.2238341)	-.0338091 (.4699082)
four children	.5320609 (.417881)	.0219172 (.7298806)	.6261281 (.4378908)	.3662978 (.7938995)
five children	(omitted)	(omitted)	.546179 (.438794)	.9609877* (.6477813)
six children	(omitted)	(omitted)	(omitted)	(omitted)
Partner				
health	-.1150432*** (.0396371)	-.0725415 (.0789351)	-.0550972** (.0297506)	-.0653293 (.0542727)
working hours	-.0021107 (.0020354)	-.0031766 (.0039682)	.0022949* (.0015452)	.0038426 (.0030217)
Year				
year 2013	-.0166211 (.104265)	-.5620617 (1.132498)	.0204643 (.076141)	-1.088789 (1.050615)
year 2015	-.163563 (.2549875)	(omitted)	.0963838 (.1821815)	(omitted)
year 2016	-.1359549 (.3738503)	-.1374572 (.2793086)	.2607928 (.2735051)	-.2275143 (.2590719)
year 2017	-.1713068 (.4586537)	(omitted)	.2574471 (.3352071)	(omitted)
down lag (t-1)	-	.0090443 (.0636235)	-	-.1469459*** (.0564522)
constant	2.907282 (4.372428)	12.56901 (14.39149)	3.948783 (3.109091)	11.202 (13.37436)
Observations	1,955	924	2,985	1,402
Number of Individuals	971	622	1,502	957

Standard errors given in parentheses () ; *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

Table 16. Individual Fixed-Effects Regressions of Frequency of Feeling Peaceful on the Working Hour and Working Hours², Split by Blue-collar and White-collar Sector

Variable	Peaceful			
	Model 1 (blue-collar)	Model 4 (blue-collar)	Model 1 (white-collar)	Model 4 (white-collar)
Independent Variables				
working hours	.0004873 (.0085231)	-.0028261 (.0142045)	.0041559 (.005832)	.0025366 (.0104734)
working hours ²	-.0000843 (.0001814)	-8.42e-06 (.0003059)	-9.83e-06 (.0001077)	-.0000472 (.0001831)
Control Variables				
net household income	-.0000249 (.0000501)	-.0001925** (.0000997)	.0000623* (.0000396)	-.0000142 (.0000675)
age	.0903095 (.1080186)	.729498*** (.3255374)	-.05777 (.0843224)	-.1414928 (.3108648)
paid	.1657272 (.1481256)	.7928768*** (.3349927)	-.2138578*** (.1063075)	-.0994199 (.2107401)
urban	.7877906 (.6634647)	1.349732 (1.172169)	.3791527 (.3268511)	4.226618*** (1.171697)
parental leave	-.0311781 (.2418497)	-.1134849 (.3526813)	-.3728739** (.2072283)	-1.149955*** (.4437408)
handicap	.034408 (.1468277)	-.0045092 (.2810281)	-.2852694*** (.1235573)	-.3710848*** (.1874462)
Civil Status				
married	.0188015 (.3017022)	-.0834751 (.5776446)	-.0842107 (.2119968)	-.0324259 (.4735688)
separated	-.8158655 (1.050431)	(omitted)	.1346861 (.7442902)	(omitted)
divorced	.0564022 (.3989212)	.0244313 (.7908748)	-.5872546* (.407598)	-.6942668 (.7879487)
widow	.9122408 (1.21474)	(omitted)	-.0868121 (.6880142)	(omitted)
Education Level				
Primary education	1.39309 (1.270789)	.3540708 (1.043141)	-.9171923 (.9106781)	(omitted)
Middle school education	.9271849 (1.158332)	.2161636 (.683362)	-1.510503*** (.6218147)	-2.603578*** (.856149)
Secondary school education	.7231625 (1.189567)	-.0129602 (.6339459)	-1.521124*** (.6295911)	-3.042855*** (.8657116)
Post-secondary education	.7297064 (1.193217)	.2675426 (.6109134)	-1.457018*** (.6315054)	-2.50057*** (.8586299)
Tertiary education	.5404094 (1.195718)	.0859049 (.6006032)	-1.405646*** (.6339212)	-2.508313*** (.855129)
Post-tertiary education	.8717865 (1.218585)	.2325447 (.6045396)	-1.559505*** (.6510537)	-2.793633*** (.8932317)
Other education	.9465063 (1.231889)	(omitted)	-1.695107*** (.6604963)	-3.13478*** (.9175325)

Table 16. Continued

Children				
one child	.0423005 (.1599775)	.0884733 (.3304865)	-.0490044 (.1322323)	.0715561 (.2358164)
two children	.1965207 (.2006391)	.1787289 (.4092478)	-.2281143 (.1829275)	-.3329134 (.3224003)
three children	.3169802 (.323062)	1.021131* (.6661599)	-.307355 (.2803615)	.1610987 (.5518541)
four children	.1164148 (.4884241)	.7779199 (.8330143)	-.3172842 (.5484763)	-.1642873 (.9322949)
five children	(omitted)	(omitted)	-.7962606* (.5496077)	-.5984119 (.7601706)
six children	(omitted)	(omitted)	(omitted)	(omitted)
Partner				
health	.0329047 (.0463283)	.003444 (.090142)	.116909*** (.0372639)	.1009562* (.0633397)
working hours	-.0044058** (.002379)	-.0060827 (.004521)	-.0050368*** (.0019354)	-.0056725* (.0035552)
Year				
year 2013	-.1764902* (.1218661)	2.811464*** (1.302441)	-.0577291 (.0953697)	-.7007456 (1.237596)
year 2015	-.1850353 (.2980323)	(omitted)	.1085495 (.22819)	(omitted)
year 2016	-.3390214 (.4369606)	.7545137*** (.3219589)	.1976695 (.3425764)	-.1633005 (.3050829)
year 2017	-.4771919 (.5360798)	(omitted)	.3026149 (.4198608)	(omitted)
peaceful lag (t-1)	-	-.0951775 (.0688619)	-	-.1719401*** (.0494823)
constant	-1.076241 (5.110544)	-32.95103*** (16.57552)	8.04603*** (3.894265)	12.32177 (15.80762)
Observations	1,955	924	2,985	1,402
Number of Individuals	971	622	1,502	957

Standard errors given in parentheses () ; *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

Table 17. Individual Fixed-Effects Regressions of Frequency of Feeling Depressed on the Working Hour and Working Hours², Split by Blue-collar and White-collar Sector

Variable	Depressed			
	Model 1 (blue-collar)	Model 4 (blue-collar)	Model 1 (white-collar)	Model 4 (white-collar)
Independent Variables				
working hours	.0024284 (.0075956)	-.0117779 (.0132386)	.0077931* (.0050203)	.0062225 (.009169)
working hours ²	.0000351 (.0001616)	.0003191 (.0002856)	-.0001421* (.0000927)	-.0001288 (.0001604)
Control Variables				
net household income	.000025 (.0000447)	.000127 (.0000926)	.0000192 (.0000341)	-.0000206 (.0000591)
age	.0297072 (.0962638)	.087219 (.3017919)	-.0860378 (.0725862)	-.1184323 (.2728653)
paid	-.0415748 (.1320063)	-.0636079 (.3129903)	-.0649645 (.0915113)	-.1626763 (.1849505)
urban	-2.293856*** (.5912653)	-2.615229*** (1.105687)	.150639 (.2813591)	4.70439*** (1.015346)
parental leave	.2552485 (.2155312)	.5893548** (.3316651)	.0449228 (.1783857)	.2843018 (.3888003)
handicap	.1693948 (.1308496)	.3957701* (.2641356)	.0299877 (.1063602)	-.2125182 (.1642194)
Civil Status				
married	.0196302 (.2688705)	.1964938 (.5393362)	-.2611955 (.1824905)	-.4669335 (.4153235)
separated	.8200579 (.9361216)	(omitted)	.4657555 (.6406979)	(omitted)
divorced	-.2836148 (.3555099)	-.1254136 (.7396156)	-.1870091 (.3508674)	.0231643 (.6922744)
widow	.6069909 (1.082549)	(omitted)	-.9293194* (.5922545)	-1.582884** (.9479196)
Education Level				
Primary education	1.110784 (1.1325)	-.6274185 (.9638807)	-.2134701 (.7839274)	(omitted)
Middle school education	.9694129 (1.032281)	-.0964373 (.6377993)	.4840217 (.5352688)	.7118583 (.7492846)
Secondary school education	.8639832 (1.060116)	-.3613118 (.5896547)	.3960668 (.5419629)	.7553631 (.7538578)
Post-secondary education	1.132829 (1.063369)	-.0595544 (.5680482)	.2825794 (.54361079)	.480501 (.7475644)
Tertiary education	1.183932 (1.065598)	-.1170068 (.5582113)	.2571875 (.5456903)	.4932601 (.7453736)
Post-tertiary education	.8193094 (1.085977)	-.1194869 (.5640938)	.348804 (.5604383)	.620286 (.7786492)
Other education	.6855235 (1.097832)	(omitted)	.6575723 (.5685666)	.8721364 (.8001571)

Table 17. Continued

Children				
one child	-.148983 (.1425685)	-.5641494** (.3069585)	.1748734* (.1138278)	.205325 (.2059629)
two children	-.2078393 (.1788052)	-.4208889 (.3819311)	.1446603 (.1574671)	.4518198* (.2814388)
three children	-.2874512 (.2879058)	-.8618818 (.6219544)	-.3554867* (.24134)	-.5174315 (.4833409)
four children	.2882639 (.4352729)	.2623888 (.7807759)	.5598849 (.4721379)	.0389253 (.8169516)
five children	(omitted)	(omitted)	.3629055 (.4731118)	.4159726 (.667504)
six children	(omitted)	(omitted)	(omitted)	(omitted)
Partner				
health	-.1245175*** (.0412867)	-.1236137* (.0842818)	-.0457531 (.0320774)	-.0546646 (.0555199)
working hours	-.0006444 (.0021201)	-.0038073 (.004211)	.0014248 (.001666)	-.0004948 (.0031152)
Year				
year 2013	-.0777695 (.1086044)	.458737 (1.20673)	.0471871 (.0820959)	-.4468318 (1.086977)
year 2015	-.1701254 (.2655999)	(omitted)	.1154824 (.1964299)	(omitted)
year 2016	-.2017166 (.3894097)	.1028169 (.298272)	.3246656 (.2948957)	-.0144466 (.2678042)
year 2017	-.2368715 (.4777426)	(omitted)	.3179473 (.3614234)	(omitted)
depressed lag (t-1)	-	-.0964654 (.0721643)	-	-.1815116*** (.0550498)
constant	1.378151 (4.554406)	-.4565326 (15.32302)	5.556501** (3.352251)	5.130737 (13.82912)
Observations	1,955	924	2,985	1,402
Number of Individuals	971	622	1,502	957

Standard errors given in parentheses () ; *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$

Table 18. Individual Fixed-Effects Regressions of Frequency of Feeling Happy on the Working Hour and Working Hours², Split by Blue-collar and White-collar Sector

Variable	Happy			
	Model 1 (blue-collar)	Model 4 (blue-collar)	Model 1 (white-collar)	Model 4 (white-collar)
Independent Variables				
working hours	-.0033465 (.0070985)	.0105914 (.0111048)	9.14e-06 (.0049139)	-.0073558 (.0091638)
working hours ²	.0000901 (.0001511)	-.0002216 (.0002391)	.0000735 (.0000907)	.0001865 (.0001602)
Control Variables				
net household income	-.000033 (.0000418)	-.0001134* (.0000778)	-.0000331 (.0000334)	-.0000186 (.0000588)
age	-.0247079 (.0899635)	.1879546 (.2544598)	-.0124215 (.0710481)	-.2401545 (.2702787)
paid	-.0603158 (.1233668)	.0791905 (.2633037)	.0362431 (.0895722)	.189459 (.1838022)
urban	1.868643*** (.5525682)	2.950453*** (.9156074)	.1187288 (.275397)	5.14465*** (1.038049)
parental leave	-.2592216 (.2014252)	-.073068 (.2754106)	-.223257 (.1746056)	-.6381377** (.3872089)
handicap	-.0633095 (.1222858)	-.3206276* (.2195636)	-.2840326*** (.1041064)	-.1900733 (.1636043)
Civil Status				
married	-.0274793 (.2512734)	.313898 (.451129)	.0721208 (.1786235)	-.0506965 (.41267)
separated	-.6525449 (.8748544)	(omitted)	-1.863131*** (.6271213)	(omitted)
divorced	-.0358405 (.3322425)	.2833067 (.6178834)	-.1468812 (.3434324)	-.2250153 (.6866545)
widow	-.6337496 (1.011699)	(omitted)	.4823925 (.5797045)	.5181081 (.9466172)
Education Level				
Primary education	.8889554 (1.05838)	-.186342 (.8073049)	-.4123417 (.7673158)	(omitted)
Middle school education	.9269346 (.9647199)	.1358787 (.5337709)	-.6828024 (.5239263)	-1.064192 (.7493543)
Secondary school education	.7912993 (.990734)	.0881373 (.4937654)	-.6942438 (.5304786)	-1.291083** (.7564871)
Post-secondary education	.696669 (.9937733)	.0193265 (.4738986)	-.6962739 (.5320915)	-.4590185 (.7526922)
Tertiary education	.5246272 (.9958565)	-.1247716 (.4663637)	-.5623034 (.534127)	-.4998782 (.749115)
Post-tertiary education	1.081211 (1.014902)	-.1555105 (.4720771)	-.5690428 (.5485625)	-.3853346 (.7831991)
Other education	1.154783 (1.025981)	(omitted)	-.8950905* (.5565185)	-1.114297 (.8029522)

Table 18. Continued

<i>Children</i>				
one child	.1461599 (.1332377)	-.0493596 (.2570058)	-.2220472*** (.1114158)	-.345834** (.2051205)
two children	.2044761 (.1671028)	-.2423455 (.3196948)	-.3833723*** (.1541304)	-.9110275*** (.2803446)
three children	.1145795 (.269063)	.3409929 (.5204832)	-.3631913** (.236226)	.2136197 (.4810058)
four children	-.2416114 (.4067852)	-.0296333 (.6524578)	-.3435554 (.4621332)	-1.074051 (.8148201)
five children	(omitted)	(omitted)	-.4119644 (.4630865)	-.2144873 (.6628061)
six children	(omitted)	(omitted)	(omitted)	(omitted)
<i>Partner</i>				
health	.1589142*** (.0385846)	.1512175*** (.0704707)	.0998563*** (.0313977)	.1373026*** (.0554777)
working hours	-.0018403 (.0019814)	-.0011395 (.003526)	.0001933 (.0016307)	-.0021212 (.0030982)
<i>Year</i>				
year 2013	-.0698493 (.1014965)	.7845461 (1.017485)	-.119692* (.0803563)	-.9493901 (1.076665)
year 2015	.0467872 (.2482169)	(omitted)	-.0209019 (.1922674)	(omitted)
year 2016	-.0092846 (.3639237)	.181651 (.2514453)	-.0678083 (.2886468)	-.2218931 (.2655471)
year 2017	.0042914 (.4464754)	(omitted)	-.0365386 (.3537648)	(omitted)
happy lag (t-1)	-	-.0701374 (.0619439)	-	-.0650763 (.0573901)
constant	3.322483 (4.256329)	-7.032284 (12.95406)	5.431404** (3.281216)	14.06465 (13.72558)
<i>Observations</i>	1,955	924	2,985	1,402
<i>Number of Individuals</i>	971	622	1,502	957

Standard errors given in parentheses () ; *** $p < 0.05$, ** $p < 0.10$, * $p < 0.15$