Supervisor: Pilar García-Gómez
Student: Pim Termote
Title: Job Hours and Health
Date: 1-7-2021

Table of Contents

1. Introduction

The optimal number of weekly working hours an employee should work is a widely studied topic. Aside from its impact on a company's efficient use of labor and minimization of productivity costs, the number of working hours has an impact on employees' mental health, stress levels and health behavior (Spiegel & Gonen, 2014). In the past decades the relative number of part-time contracts has risen across Europe, with the Netherlands experiencing the steepest upward trend. Among OECD countries, the part-time employment as a percentage of total employment is highest in the Netherlands, measured at 37.0%. The second highest scoring country, Switzerland, scores considerably lower with a percentage of 26.9% (OECD Labour Force Statistics 2020). Due to these numbers the Netherlands are characterized as "*the only part-time economy of the world, with a finger in the dike of unemployment"* (Visser, 2002, p. 2)

The work environment of part-time employees is often less optimal compared to full-time workers. Overall, part-time jobs are often low level, more monotonous and less financially rewarding, which results in fewer opportunities for personal development (Muñoz de Bustillo et al, 2008). Furthermore, Buddelmeyer et al. (2005) claim that part-time employees are at a greater risk of financial hardship. These findings are supported by McDonald et al. (2009). The paper argues that despite the strong beneficial bargaining arrangements, part-time workers are exposed to major concerns regarding job quality. The main issues found by McDonald et al. are a lack of promotion opportunities, greater work intensity and poor workplace support. In short, the aforementioned papers suggest that the characteristics of part-time employees are likely to be less favorable compared to those of full-time employees. Therefore, these challenges might result in different health outcomes for part-time workers compared to full-time workers.

There is a vast body of literature studying the relationship between job hours and health. Kleiner et al. (2015) compare Germany and the United States in terms of the effect of working time on mental health. They hypothesize that, in Germany, the regulated work time environment and the smaller incentives to work long hours compared to the U.S. causes a different relationship between job hours and mental health. They did not reject the hypothesis as the results suggest that working 60+ hours per week in the U.S. is not worse for mental

health than working 40 hours per week. However, in Germany, long working hours are significantly correlated to lower mental health scores on the SF-12 mental health scale. Furthermore, the authors find that employees working part-time in the U.S. report decreased mental health whereas no relationship between shorter working hours and mental health is found in Germany. Kamerade et al. (2019) study the optimal number of working hours for employees with respect to mental health. Using a fixed effects model, they find that a low number of working hours yields significant mental health benefits for previously unemployed individuals. However, the paper claims that a so-called optimum number of working hours for which mental health is at its highest does not exist among the British population. The authors state that these findings provide relevant evidence against shorter work week policies in the UK.

However, CNV, one of the largest labor unions in the Netherlands, claims that the number of hours in an optimal working week should be 30 hours instead of 36-40 hours. They argue that a reduction in working hours decreases sick leave and burnouts (NOS, 2019). While CNV suggests such a relationship, further evidence of this relationship in the Netherlands is relatively scarce and outdated. In order to accept the claim made by the CNV, it is necessary to check whether claims of deteriorating health of employees also hold in the Netherlands, given the extensive use of part-time employees. Only then will it be possible to implement relevant policies. Therefore, the aim of this paper is to determine the impact of working hours on mental health and healthy behavior

Using the LISS panel dataset, this paper answers the main question by looking at three different components of health and healthy behavior. Firstly, by using the MHI-5 mental health index, the effects of job hours on mental health will be investigated. Secondly, this paper examines the effect of job hours on tobacco and alcohol consumption. Tobacco consumption will be measured using the frequency of consumption whereas alcohol consumption will be measured by combining both the frequency and quantity of consumption. Job hours are divided into four job hours categories. Subsequently, levels of overwork function as explanatory variable.

Mental health is the studied health outcome as mental health effects are immediately visible and easier to measure as opposed to physical health whose consequences change gradually (Picchio & van Ours, 2019). Tobacco and alcohol consumption are the underlying variables representing unhealthy behavior. Many papers find evidence of a strong relationship between

these three variables. Degenhardt and Hall (2001) use data from the Australian National Survey of Mental Health and Well-being and find that tobacco use is strongly associated with alcohol abuse. Furthermore, current smokers are more likely to suffer from a psychosis and report greater mental distress compared to non-smokers and never smokers. This claim is supported by Wiesbeck et al. (2008). They link smoking to depression with alcohol dependence as a significant predictor of depression.

The rest of the paper follows the following structure: Chapter two provides a literature review on the association between job hours, mental health and unhealthy behavior. Chapter three describes the data and chapter four presents the econometric model. Chapter five contains the results which are discussed and analyzed in chapter six of this paper.

2. Literature Review

This section provides a brief summary of the existing literature. The bulk of this review summarizes the existing literature on the relation between working hours and the dependent variables. There is little research about the impact of transitioning from fulltime to part-time or vice versa on mental health and unhealthy behavior. Therefore, the literature review mainly consists of associations between working hours and mental health, tobacco and alcohol consumption.

2.1. The relation between working hours and mental health

The effect of working hours on mental health is a widely studied topic. Sparks et al. (1997) review nine quantitative and twelve qualitative studies on the association between working hours and health. The meta-analysis of the nine quantitative papers indicates a small but significant positive correlation between the number of working hours and mental health indicators such as fatigue and stress. The meta-analysis of the twelve qualitative papers supports these findings and finds a positive correlation between job hours and mental illness. Based on their findings the authors suggest a non-linear relationship between working hours and health indicators.

Furthermore, flexible work policies could reduce the symptoms of stress caused by hours worked. Halpern (2005) uses a sample of working adults in the US and finds that flexible work policies reduce symptoms of stress. Besides decreasing unemployment, she concludes that individuals exposed to various time-flexible work policies show more loyalty to their employer and report fewer symptoms of stress. Even though women generally perform more childcare and household tasks, both men and women increase commitment to their employer and reported fewer stress symptoms as a result of flexible work policies. Booth & van Ours (2008) take into account interdependence within the family to investigate the association between wellbeing and part-time work. The authors find that part-time working women are more satisfied with their working hours compared to women working full-time. Furthermore, women's happiness improves if their partners are employed full-time. On the other hand, the life satisfaction of men remains unaffected by their spouses' work hours but increases if they themselves are full-time employees. To conclude, the aforementioned papers agree that mental health improves with lower working hours and more flexible work policies reduce symptoms of stress. Furthermore, Booth & van Ours state that gender differences exist as women prefer part-time jobs whereas male's happiness improves if they work full-time.

The previous papers did not take into account overworking. Long working hours significantly increase the risk of job-related stress and mental illness. Additionally, a stressful life can negatively impact health as there is a clear link between the central nervous system and the immune system (Glaser, 2009). Hence, if an individual is stressed, the central nervous system releases stress hormones which disturb the balance kept by the immune system. Bannai and Tamakoshi (2014) elaborate on the link between long working hours and stress. They find that overworking is positively associated with the prevalence of anxiety, poor sleep habits and depression. Sato et al. (2020) study the same issue and find that after accounting for unobserved heterogeneity, long working hours deteriorate mental health among white-collar workers. This relationship is supported by Caruso et al. (2006). They document that the relationship between long work hours and their risks is rather complex and is determined by both the worker and the job itself. The paper suggests that the main risks of long working hours stem from longer exposure to work hazards and less leisure in order to recover from work. To conclude, long job hours in terms of overworking seem to increase stress which may lead to unfavorable health outcomes. However, heterogeneity plays a major role in summarizing the impact of long job hours on health. Data, period of analysis, population and other factor such as labor market conditions are important aspects that influence the results significantly. Furthermore, the effect depends on the way wellbeing is considered.

2.2. The relation between working hours and tobacco consumption

Artazcoz et al. (2009) use a Catalonian sample composed of salaried men and women of 16-64 years old. Using multiple logistic regression models while controlling for age, job and family characteristics, the paper finds that, for both men and women, working 51-60 hours is associated with smoking and shortage of sleep. Rosenthal et al. (2012) examine the association between employment status and tobacco and alcohol use among adults in low resource communities in New Haven. In order to compare those employed full-time and part-time in self-reported mental health and unhealthy behavior, they conduct ANOVA analyses while controlling for ethnicity, age and gender. The results show that those employed fulltime report the lowest levels of smoking and drinking. Part-time employees are placed in the middle whereas the unemployed are on the unhealthy side of the distribution. According to these papers, the number of working hours is related to an individual's probability to smoke.

2.3. The relation between working hours and alcohol consumption

A cross sectional study using an Australian sample by Schluter et al. (2012) investigates the relationship between long working hours and harmful alcohol consumption. They use logistic regression models and, as in most papers, control for characteristics such as gender, age and ethnicity. The authors find a positive relationship between long working hours and daily alcohol consumption. 11.8 percent of the participants working less than 30 hours a week consume more than two drinks a day compared to 20.2 percent among individuals working more than 50 hours per week. Alcohol consumption of more than two drinks a day of those working 30-39 hours and 40-49 hours a week is 11.3 and 15.4 percent respectively. Virtanen et al. (2015) also support these findings. In their paper they conduct a cross sectional analysis based on 61 studies from 14 countries to explore the relationship between long working hours and alcohol use. They find that the odds ratio of abundant alcohol consumption for those working 49-54 hours and more than 55 hours were 1.13 and 1.12 respectively, compared to individuals working a standard working week of 35-40 hours. Hence, overworking is likely to increase alcohol consumption. Dooley and Prause (1998) examine the impact of unemployment and underemployment on alcohol misuse using panel data. They suggest that, while controlling for prior depression, underemployment significantly increases the risk of heavy drinking. To summarize, the relationship between working hours and alcohol consumption is not entirely clear based on the papers described above. Some papers find that long working hours increase the probability of excessive alcohol consumption (Schluter et al. 2012; Virtanen et al. 1998), while the other paper finds that underemployment leads to heavy drinking (Dooley and Prause, 1998).

Even though the effect of working hours on health and healthy behavior is a frequently studied topic, results across the literature are quite inconsistent. The magnitude and in some cases the direction of the effects differ significantly across studies. The difference in coefficients found in these papers are mainly driven by the used identification strategies. Furthermore, data, period of analysis, population and other factor such as labor market conditions are important aspects that influence the results significantly. Considering that these results are not sufficiently robust to different conditions, it is difficult to draw any expectations regarding directions that are expected for this research. However, it is relevant to determine what econometric techniques and control variables are commonly used in similar studies. An IV is considered a superior technique in order to estimate causal impact and avoid biases such as reverse causality. Unfortunately, the LISS panel dataset does not provide a valid instrument.

3. Data

3.1. Data description

This paper uses data from the Longitudinal Internet Studies for the Social sciences (LISS) administered by CentERdata (Tilburg University). The LISS panel contains a Dutch sample of individuals aged 16 years and older who participate in monthly surveys. The panel is selected using the combined efforts of CentERdata and Statistics Netherlands. Approximately 5000 households consisting of about 7000 respondents participate in the survey and participants of the survey are compensated for every questionnaire they complete. The survey contains a broad set of domains such as work, religion, health, work and schooling. The research includes the background variables in combination with the subsets containing *work, schooling* and *health* variables from the years 2008-2013 and 2015-2019. Wave 2014 is excluded as it misses crucial health variables.

The *health* and *schooling* subsets are yearly conducted surveys whereas the background variables are conducted monthly. The background variables used for this thesis are those collected in the same month as the *health* survey. After dropping outliers and restricting the sample to employed individuals aged 16 to 65 years, the database consists of 31,593 observations and 8,782 individuals. Due to attrition, the panel is unbalanced and not every respondent is present in each wave. In the final dataset 307 individuals (3.5%) are present in every wave.

3.2. Variables

Independent variable

Actual working hours

Number of actual working hours is the explanatory variable for this analysis. The number of actual working hours is derived from the question '*How many hours per week do you actually work on average in your job?*. Even though this variable is a more subjective variable than the answer to the question *'How many hours per week are you employed in your job, according to your employment contract?'*, it allows for a distinction between individuals who overwork and individuals who stick to their predetermined employment contract. The mean number of actual working hours is approximately 32 hours per week whereas the mean number of contract hours is 30 hours per week. In order to compare the mental health and tobacco and alcohol consumption among working hour levels, the explanatory variable, actual working hours, is divided into four categories: 1-16h, 17-32h, 33-48h and 49+ hours per week.

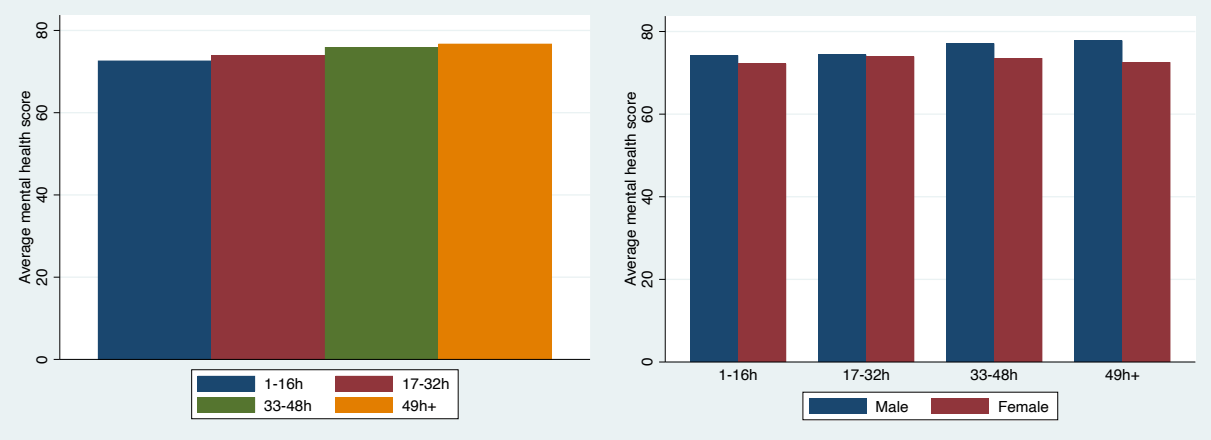
Dependent variables

As discussed in the introduction, the outcome variables in this analysis are mental health, tobacco and alcohol consumption.

Mental health (MHI5)

The Mental Health Inventory (MHI-5) variable captures the mental health of individuals who participated in the LISS survey. The MHI-5 is comparable to the MHI-18, a more extensive version of the MHI5, which makes it a reliable predictor of mental disorders (Berwick et al. ,1991). Respondents are given six possible answers (*'never', 'seldom', 'sometimes', 'often', 'mostly', 'continuously'*) to describe how relatable the following five statements have been in the past month *'I felt very anxious', 'I felt so down that nothing could cheer me* up', *'I felt calm and peaceful', 'I felt depressed and gloomy'* and *'I felt happy'*. The MHI-5 is then calculated as follows. Firstly, the scores for the negative outcomes are reversed and transformed to a scale ranging from 0 to 5. Secondly, the sum of these five answers is calculated, resulting in a maximum score of 25. Finally, the obtained score is multiplied by 4. This means that the range of the MHI-5 scores is from 0 to 100, the maximum score of 100 indicates the most desirable health state in terms of mental health.

Figure 1: Average mental health score by job hours categories.

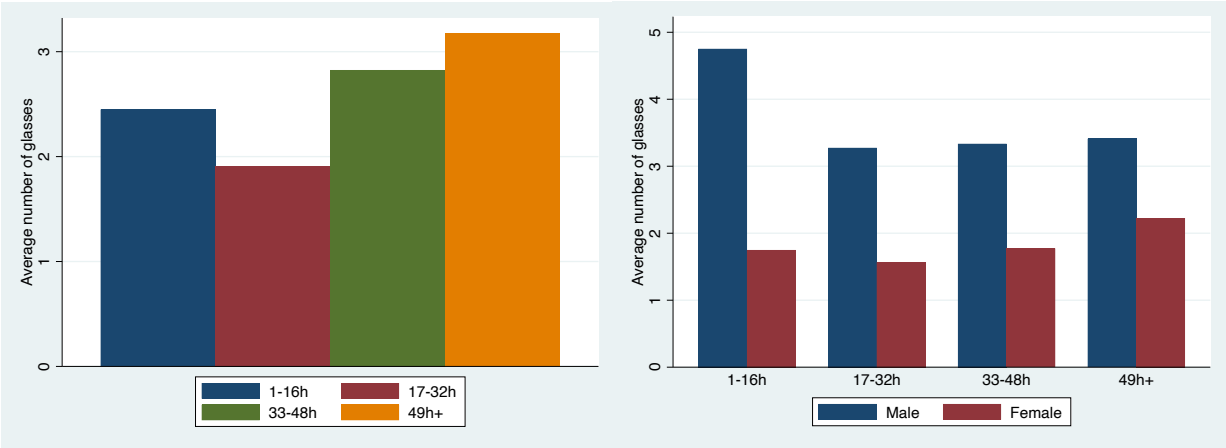


The mean MHI-5 score of the entire sample is 74.9. Furthermore, MHI-5 scores increase alongside the number of working hours, indicating that mental health improves with job hours. Figure 2 shows the MHI-5 score by gender. Among all job hour categories, males (76.6) score higher than females (73.3) on the mental health index. (Table A1)

Alcohol consumption

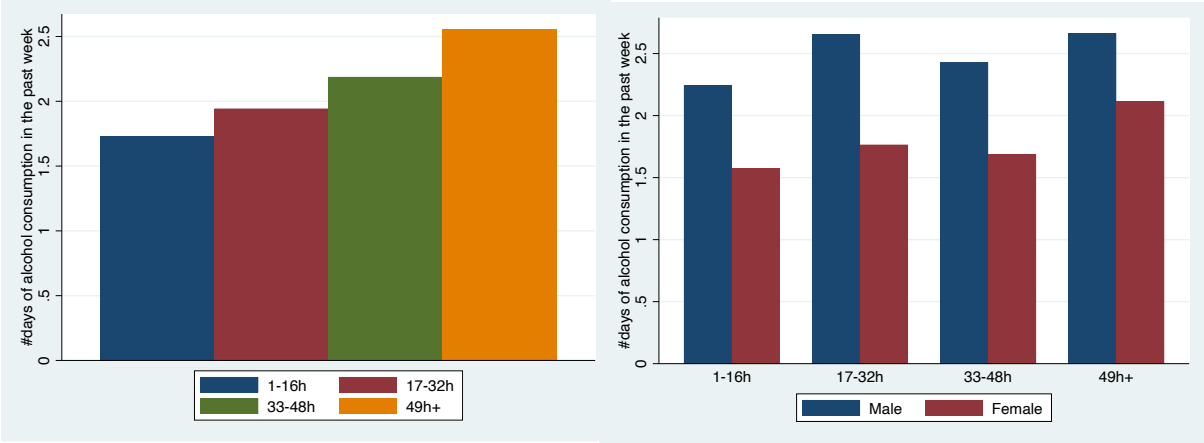
The analysis measures alcohol consumption in terms of both the quantity and frequency of drinking. Related to frequency, respondents are asked: *'On how many of the past seven days did you have a drink containing alcohol?'* The survey measures quantity using two questions. Firstly, respondents are asked the following question: *'Please think of the one day during the last week on which you drank the most amount of drinks containing alcohol. Please indicate below what kind of alcoholic drink you drank that day.'* Secondly, participants are also asked to indicate the amount of every unit they drink on the given day. Furthermore, for each question, the type of serving is asked (e.g., half liter cans, small cans, large bottles). In order to construct the units an individual drinks on the give day and to increase validity, both strong beers and half liter cans count as two units. Stronger liquor such as gin, whisky and rum count as a single unit since these types of beverages are often served in smaller portions.

Figure 2: Number of glasses on the heaviest drinking day by job hours categories.



The mean number of glasses consumed on the heaviest drinking day in the past week is 2.5 for the entire sample. However, in terms of quantity, males (3.4) drink more than females (1.6) (Table A1). Starting from the second job hours category, alcohol consumption increases. Furthermore, the figure shows that the difference in number of glasses between females and males decreases over the job hours categories.

Figure 3: Number of days of alcohol consumption in the past week by job hours categories.

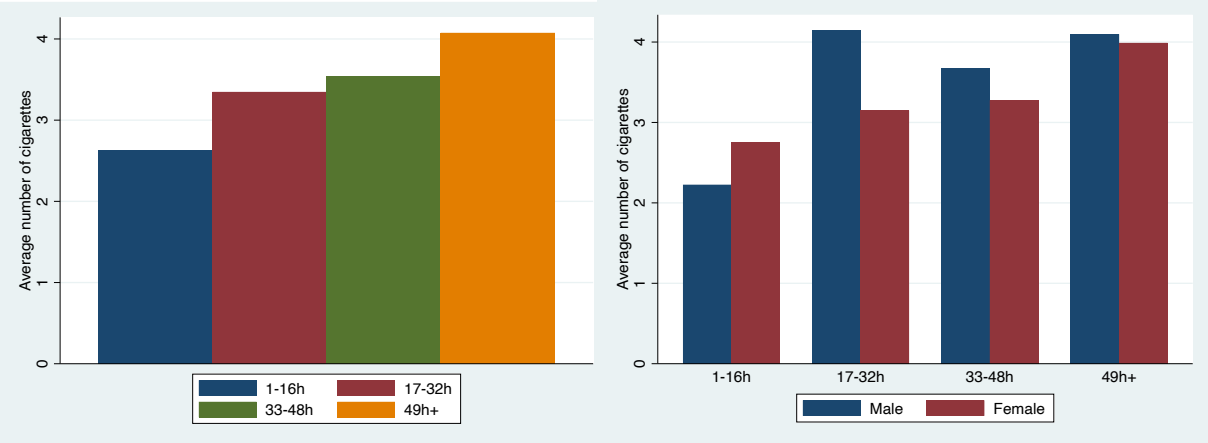


The mean number of days on which participants consume alcohol during the week is 2.5 for the entire sample. However, in terms of frequency, males (2.5) consume alcohol more frequently than females (1.7) (Table A1). Figure 3 shows that frequency of alcohol consumption increases among job hours levels.

Tobacco consumption

Participants are asked the following questions in order to measure tobacco consumption. First, participants indicate whether they currently smoke. Then, they answer the following question: *'How many cigarettes (including rolling tobacco) did you smoke on average per day?* Unfortunately, respondents are not asked about the frequency of tobacco consumption. Hassmiller et al., (2003) find that among smokers, 80.8% are *daily* smokers and 19.2% are *some-day* smokers. Therefore, as most currents smokers are daily smokers, questions regarding frequency of smoking are less relevant.

Figure 4: Number of cigarettes smoked on an average day by job hours categories.



The mean number of cigarettes smoked on an average day is 3.4 for the entire sample. Males (3.7) smoke on average more than females (3.1) (Table A1). The figure shows that tobacco

consumption of the entire sample increases by job hours categories. The same pattern is found for females. However, male smokers do not smoke more if the number of working hours increases as men working 17-32h per week smoke on average the most.

3.2.1. Covariates

Table 1 shows the descriptive statistics of the entire sample. The average age of the final sample is 44 years. Approximately 56% is married and 47% is male. Marital status is included since it might have an effect on mental health state since unmarried individuals often live on their own. *Kids* is a dummy variable for having children, 52% of participants report they have kids. According to Cutler & Lleras-Muney (2008), dimensions of socioeconomic status such as income and education show a strong and positive correlation with health. The higher the educational attainment/income, the better the individual's health. Therefore, variables for education and income are included in the analysis. The variable *education* is split into three categories, namely low, medium and high education. According to CBS[1], low education corresponds to primary education and VMBO[2], medium includes school and high school (HAVO/VWO/MBO)[3] and high education corresponds to academic education (HBO, WO)[4]. 23.2% of the employed individuals have low education, 37.7% are medium educated and 39.1% have are high educated. Net household income is divided in four categories ranging from 0-1500, 1501-300, 3001-5000 and >5000 euros per month.

Table 1: Descriptive statistics

		Obs.	Mean	St. Dev.	Min	Max
	Age	31,593	44.194	13.037	16	65
	Male	31,593	.468	.499	0	1
	Married	31,593	.556	.497	0	1
Education category	Low	31,593	.232	.422	0	1
	Middle	31,593	.377	.484	0	1
	High	31,593	.391	.488	0	1
Household Income	0-1500EUR	31,593	.094	.292	0	1
	1501-3000EUR	31,593	.360	.480	0	1
	3001-5000EUR	31,593	.363	.481	0	1
	5000EUR+	31,593	.183	.387	0	1
	Kids	31,593	.520	.520	0	1
	Actualhours	31,593	31.859	13.367	1	96
	# of cigarettes	31,593	3.381	6.767	0	35
	# of glasses	31,593	2.514	3.351	0	29
	# days of alcohol	31,593	2.514	3.351	0	7
	MHI5	31,593	74.900	15.741	0	100

[1] CBS (Statistics Netherlands)
[2] VMBO (intermediate secondary education, US: junior high school)
[3] HAVO/VWO (higher secondary education/preparatory university education, US: senior high school) MBO (intermediate vocational education, US: junior college)
[4] HBO (higher vocational education, US: college) WO (university)

4. Methodology

The empirical investigation includes three health outcomes are: MHI-5, tobacco consumption and alcohol consumption. For each of the three outcome variables three fixed effects models are estimated. The first model includes both the contemporaneous and the lagged explanatory dummy variables, the second model includes only the lagged and the third the contemporaneous dummies. The interpretation of the fixed effects estimates is mainly focused on the first model. However, the second and third model function as a sensitivity analysis in order to check for robustness of the first model.

4.1. Fixed Effects

MHI-5, tobacco and alcohol consumption for individuals, denoted as $y_{i,t}$ and described as a function of working hours and other covariates, is defined as follows:

$$y_{i,t} = \beta_0 + \beta_p w_{i,t} + \beta_p w_{i,t-1} + \beta_x x_{i,t} + \alpha_i + \varepsilon_{i,t} \quad (1)$$

Equation (1) includes both the lagged and contemporaneous explanatory dummy variables. Here, level of working hours are captured in $w_{i,t}$ and $x_{i,t}$ represents a set of observable regressors. These control variables include age, gender, marital status, education and household income. $W_{i,t}$ represents the instantaneous effect of job hours on the outcome variables. Furthermore, a lagged independent variable of $w_{i,t}$ is added to control for the reverse impact from the variables of interest on the level of working hours. The composite unobserved error term $u_{i,t}$ is a combination of α_i and $\varepsilon_{i,t}$. Where α_i represents unobserved individual heterogeneity that potentially has an effect on an individual's health state and $\varepsilon_{i,t}$ denotes the idiosyncratic time invariant error term. In (1), no correlation between the regressors and the error terms is assumed. However, individual's traits not captured by our control variables might correlate with the decision to work more or less hours. Hence, the zero condition mean assumption does not hold as unobserved heterogeneity leads to correlation between the regressors and the error term i.e. $E(u_{i,t} \mid w_{i,t}) \neq 0$. Then, the true causal effect of an increase/decrease in working hours is not estimated as we obtain inconsistent estimates (Wooldridge, 2002). In order to account for time invariant unobserved individual-specific traits, the paper uses a fixed-effects model.

5. Results

5.1. MHI5

Table 2 provides the results of the fixed effects regression estimates for the mental health indicator MHI5. For each of the three models the results show that for both genders no clear effect of working hours on mental health exists. The coefficients suggest a negative relationship between job hours and mental health, albeit economically insignificant. However, for females the coefficient of the lag of 33-48 hours is significant at the 10 percent level in both the first and second model. This indicates that women who have worked 33-48 hours in the previous period score approximately 1.2 points lower on the MHI5 mental index compared to women that have worked 1-16 hours in the previous period. Table A2 in the appendix provides the full model including the control variables. Among females, aging (1 year) has a significant effect on mental health scores. For males, having kids and having a household income of more than 1500 EUR per month has a significant effect on the MHI5.

Table 2: Fixed Effects model of the MHI5 health index on working hours for males and females

		MHI5					
		Female			Male		
		(1)	(2)	(3)	(1)	(2)	(3)
Job hours level	17-32h	.092	-	-.153	-.228	-	.176
		(.545)		(.457)	(.801)		(.714)
	33-48h	.333	-	.496	-.864	-	-.344
		(.676)		(.556)	(.783)		(.686)
	49h+	-1.578	-	-.188	-.938	-	-.837
		(1.391)		(1.155)	(.875)		(.755)
Job hours level (t-1)	17-32h	-.874	-.862	-	-.367	-.474	-
		(.561)	(.572)		(.875)	(.661)	
	33-48h	-1.238*	-1.223*	-	-.084	-.302	-
		(.686)	(.703)		(.672)	(.661)	
	49h+	-1.621	-1.756	-	-.278	-.500	-
		(1.444)	(1.535)		(.781)	(.772)	
	Observations	11,969	11,969	11,969	10,808	10,808	10,808

5.2 Alcohol consumption

Drinking behavior is presented in both quantity and frequency of drinking. In terms of quantity, the model measures the number of drinks on the heaviest drinking day. Frequency corresponds to the number of days an individual consumes alcohol during the week.

5.2.1 Alcohol quantity

For females, the coefficients of both the contemporaneous and lagged job hours levels are insignificant at all significance levels. This suggests that the number of hours worked does not have a significant effect on alcohol consumption. Among men, working 17 hours per week or more in t-1 decreases the number of units of alcohol consumed on the heaviest drinking day approximately by .350 units compared to those working 0-16 hours in period t-1. However, these coefficients are statistically insignificant in model 2, although the point estimates are close (Table 3). Table A3 in the appendix provides the full model, including controls. For both genders, age has a significant effect on alcohol consumption in all three models. Among females, being married and having a higher income has a significant effect on alcohol consumption, these coefficients are insignificant among male.

Table 3: Fixed Effects model of the number of alcohol units on the heaviest drinking day in the past seven days for males and females

		Number of glasses					
		Female			Male		
		(1)	(2)	(3)	(1)	(2)	(3)
Job hours level	17-32h	.109	-	.077	-.105	-	-.339
		(.083)		(.074)	(.228)		(.213)
	33-48h	.164	-	.186**	.077	-	-.191
		(.112)		(.093)	(.743)		(.209)
	49h+	.315	-	.170	.411	-	.113
		(.192)		(.158)	(.120)		(.235)
Job hours level (t-1)	17-32h	-.078	-.062	-	-.345*	-.312	-
		(.079)	(.080)		(.196)	(.199)	
	33-48h	-.071	.101	-	-.323*	-.261	-
		(.106)	(.103)		(.098)	(.198)	
	49h+	-.114	-.062	-	-.426**	-.344	-
		(.193)	(.186)		(.215)	(.219)	
	Observations	11,969	11,969	11,969	10,808	10,808	10,808

5.2.2. Alcohol frequency

For females, the coefficients in table 4 of the contemporaneous job hours categories 33-48h and 49h+ hours are significant in the first model. This indicates that females working 49 hours or more drink .257 more days per week compared to those working 0-16 hours per week. However, these coefficients are not significant in the third model. Among males, the lagged job hours levels of 33-48h and 49h+ hours are significant at the 5 percent level in both model 1 and 2. Hence, men working 49+ hours per week in t-1 drink .196 more days per week compared to those working 0-16 hours per week in t-1, ceteris paribus. The magnitude of the lagged variables is lower in model 1 than in model 2. Table A4 in the appendix shows the

estimated coefficients of the control variables. Being married, having higher educational attainment and a household income of more than 3000EUR per month has a significant effect on weekly alcohol consumption among females compared to their reference categories. For men, only age and a household income of 3001-5000EUR per month has a significant effect in all of the three models on weekly alcohol consumption.

Table 4: Fixed Effects model of the frequency of drinking in the past seven days for males and females

		Alcohol frequency					
		Female			Male		
		(1)	(2)	(3)	(1)	(2)	(3)
Job hours level	17-32h	.048	-	.030	-.028	-	-0.097
		(.053)		(.046)	(.010)		(.087)
	33-48h	.115*	-	.071	.076	-	.074
		(.063)		(.054)	(.092)		(.079)
	49h+	.257**	-	.139	.121	-	.158*
		(.121)		(.105)	(.107)		(.093)
Job hours level (t-1)	17-32h	-.046	-.038	-	.046	.058	-
		(.053)	(.053)		(.092)	(.091)	
	33-48h	.011	.034	-	.150*	.179**	-
		(.063)	(.063)		(.081)	(.081)	
	49h+	-.022	.022	-	.196**	.228**	-
		(.114)	(.115)		(.095)	(.097)	
	Observations	11,969	11,969	11,969	10,808	10,808	10,808

5.3. Tobacco consumption

The coefficients of both the job hours levels and the lagged job hours level show that among both genders, tobacco consumption increases with job hours, as the magnitude increases among the job hour levels (Table 7A). The contemporaneous coefficient of the third job hours category is significant in both models for females. This means that women working 33-48 hours per week smoke .481 more cigarettes compared to women who work 0-16 hours per week. The coefficient of the fourth job hours category is significant with a magnitude of .964. The magnitude of these coefficients remains significant but decreases in model 3 compared to model 1. Furthermore, the lagged job hours level for the 33-48 hours category is significant in model 1 and 2, but its magnitude decreases in model 2. So a woman working 33-48 hours in t-1 smokes on average .512 more cigarettes in period t compared to a woman working 0-16 hours in period t-1, ceteris paribus. For males, the coefficients of the explanatory variables are not economically significant. Model A5 includes control variables and can be found in the appendix for both males and females, age has a significant effect on tobacco consumption.

Table 5: Fixed Effects model of the average number of cigarettes smoked on a day for males and females

		Tobacco consumption					
		Female			Male		
		(1)	(2)	(3)	(1)	(2)	(3)
Job hours level	17-32h	.348*	-	.174	.074	-	.073
		(.192)		(.156)	(.322)		(.268)
	33-48h	.481**	-	.440**	.142	-	.265
		(.239)		(.196)	(.294)		(.236)
	49h+	.964**	-	.702**	.623*	-	.630**
		(.449)		(.366)	(.366)		(.290)
Job hours level (t-1)	17-32h	.183	.231	-	.092	.128	-
		(.192)	(.193)		(.341)	(.343)	
	33-48h	.512**	.601***	-	.340	.459	-
		(.239)	(.193)		(.304)	(.300)	
	49h+	.686	.841*	-	.422	.515	-
		(.461)	(.469)		(.345)	(.336)	
	Observations	11,969	11,969	11,969	10,808	10,808	10,808

5.4. Overwork

The final part of the results section covers the effect of overwork on the outcome variables. Here, the number of *contract hours* is subtracted from the number of *actual hours* and divided into five overwork categories; *no overwork*, 1-8h, 9-16h, 17-24h and 25-32 hours of overwork per week. The group of individuals that does not overwork functions as the reference category. Again, the focus of the analysis is on the first model in which the lagged effects conditional on contemporaneous effects are considered.

Table 6: Fixed Effects model for overwork categories for all outcome variables

		Outcome variables							
		MHI-5		Numb. of glasses		Alc. past week		Number of cig.	
Per.	Cat.	Female	Male	Female	Male	Female	Male	Female	Male
t	1-8h	.159	-.657*	.119**	.062	.073**	.005	.131	-.199
		(.396)	(.394)	(.052)	(.103)	(.039)	(.046)	(.163)	(.157)
	9-16h	.471	-.587	.330***	.384**	.038	.026	.068	.406**
		(.841)	(.614)	(.115)	(.167)	(.088)	(.071)	(.325)	(.108)
	17-24h	-1.573	.029	.102	.479*	.040	.005	-.092	.577*
		(.880)	(.762)	(.240)	(.267)	(.167)	(.111)	(.469)	(.494)
	25-32h	3.360	.470	1.118	.093	.415	.147	.966	-1.190
		(.926)	(.872)	(.987)	(.830)	(.505)	(.258)	(.492)	(.892)
t-1	1-8h	.043	.186	.097**	.067	.069**	.035	.068	.532***
		(.365)	(.355)	(.049)	(.101)	(.039)	(.047)	(.153)	(.175)
	9-16	.584	-.049	-.002	-.010	.078	.090	.569	.570***
		(.767)	(.606)	(.132)	(.134)	(.090)	(.072)	(.320)	(.263)
	17-24h	.590	-.137	-.076	.517**	-.215	.073	-.255	1.060***
		(.823)	(.708)	(.219)	(.257)	(.154)	(.124)	(.508)	(.547)
	25-32h	-2.246	-2.256	.918*	.611	.619***	.170	.883	-.618
		(.917)	(.815)	(.552)	(.440)	(.285)	(.210)	(.623)	(.805)
	Obs.	9,153	8,362	9,153	8,362	9,153	8,362	9,153	8,362

Table 6 provides the results of the fixed effects regression estimates for all outcome variables. For both genders the results show that no clear effect of overworking hours on mental health exists. For alcohol consumption in terms of quantity, the coefficients of most of the lagged overworking levels are not significant. Females that overwork 1-8 hours per week in period t-1 drink on average .097 more glasses on their heaviest drinking day compared to women that do not overwork. The magnitude of the coefficient is small, but significant for both the contemporaneous and lagged variable. Males that overwork 17-24 hours per week consume .517 more glasses of alcohol on their heaviest drinking day compared to men that do not overwork. However, the contemporaneous coefficient is not significant at all significance levels. In terms of frequency of drinking, the coefficients for males are insignificant. However, women that overwork 1-8 hours in period t-1 consume alcohol .069 more days per week

compared to women that do not overwork. Overworking does not have a significant effect on tobacco consumption among males. However, the lagged coefficients for the first three overwork categories are significant at the 1 percent level for females. Furthermore, the magnitude of the coefficients increases by the level of overwork. In short, women that overwork 17-24 hours in period t-1 smoke on average 1.060 cigarettes more compared to women who did not overwork in period t-1.

6. Discussion

CNV, one of the largest labor unions in the Netherlands, claims that optimal working week consists of 30 working hours instead of 36-40 hours. They argue that a reduction in working hours would decrease sick leave and burnouts (NOS, 2019). Before companies implement a shift in their working hour policy, it is relevant to determine whether this claim (of the CNV) is valid for the Dutch population. Using the LISS panel, administered by CentERdata (Tilburg University), this paper examines the effects of working hours on mental health and unhealthy behavior. The empirical strategy to tackle endogeneity of working hours is structured as follows. The thesis estimates fixed effects models by gender in order to account for unobserved heterogeneity. Furthermore, in order to limit the reverse impact, the research includes lagged independent variables. Finally, this study estimates three models containing contemporaneous variables, lagged variables and both as a sensitivity analysis.

The results suggest that working hours do not have a significant impact on the MHI5 mental health index and the number of glasses consumed on the heaviest drinking day for both genders. However, working hours seem to have a moderate effect on unhealthy behavior in terms of frequency of alcohol consumption and daily tobacco consumption. In terms of frequency of alcohol consumption, working 49+ hours per week in period t-1 increases weekly alcohol consumption by approximately .200 days compared to those working 0-16h per week among males. For females, the results suggest that working 33-48 hours significantly increases tobacco consumption compared to the reference category; women working 33-48 hours per week smoke on average .500 more cigarettes on a daily basis compared to women working 0-16 hours per week. Furthermore, overworking increases tobacco consumption among women.

As described in the literature review, there is a considerable amount of evidence on the link between working hours and health-risky behavior such as alcohol and tobacco consumption. However, the causal effect of job hours on health is still unclear as most of the empirical studies only report a correlation. Evidence of causal estimates is scarce since identifying the causal impact of working hours on health outcomes is challenging due to the endogeneity of working time (Rehm & Wunder, 2018). In this study, lags for the independent variables are added in order to limit reverse causality. However, the significant effects for tobacco consumption and alcohol consumption on a daily basis might still be spurious as reverse causality between these variables and the level of job hours cannot completely be excluded. Changes in tobacco and

alcohol consumption might influence the probability of job hours on a shorter or longer lagged effect. However, these effects cannot be observed using this study.

As discussed in the literature review, an instrumental variable method is a superior method to account for reverse causality. Unfortunately, the LISS panel does not provide a valid instrument to apply this method. However, there are some papers that succeed in finding causal estimates of working hours on health outcomes using an IV method. For example, Ahn (2016) exploits the stepwise implementation of the legally defined workweek reduction in South Korea. Here, the variation in implementation of this policy as an instrument for job hours is used in combination with a fixed effects model. In the panel, the average hours worked per week decreases due to the workweek reduction policy from 52.1 to 49.8. The paper finds that a reduction in job hours increases alcohol consumption whereas it decreases the probability of smoking. Berniel & Bietenbeck (2017) use a different approach. In their paper they study a French reform which reduced the statutory workweek from 39 to 35 hours. Since various French employers implemented the 35-hours workweek and some did not, they use a difference-in-difference approach combined with lagged dependent variables in order to estimate causal impacts. The study reveals a positive effect of working hours on smoking and body mass index.

Unfortunately, the LISS panel does not contain a valid instrument nor does the average amount of hours worked vary across years due to a policy implication similar to the studies described above. Furthermore, region specific reductions in statutory workweeks as CNV proposed have not been introduced in the Netherlands. Hence, a method similar to the difference-in-differences method Berniel & Bietenbeck exploited, is not feasible. The main findings of two papers are in line with the results of the current analysis: higher working hour levels increases tobacco consumption while these effects are stronger for female.

7. References

Ahn, T. (2016). Reduction of working time: does it lead to a healthy lifestyle?: working time and health behaviors. Health Economics, 25(8), 969–983. https://doi.org/10.1002/hec.3198

Bannai, A., & Tamakoshi, A. (2014). The association between long working hours and health: a systematic review of epidemiological evidence. *Scandinavian Journal of Work, Environment & Health*, *40*(1), 5–18.

Booth, A. L., Van Ours, J. C., & Centre for Economic Policy Research (Great Britain). (2006). *Hours of work and gender identity does part-time work make the family happier?* (Ser. Discussion paper / centre for economic policy research, labour economics, no. 5438). Centre for Economic Policy Research.

Buddelmeyer, H., Mourre, G. and Ward-Warmedinger, M. (2005), "Part-time work in EU countries labour market mobility, entry and exit", *ECB Work. Pap. Ser*.

Cygan-Rehm, K., & Wunder, C. (2018). Do working hours affect health? evidence from statutory workweek regulations in germany. *Labour Economics*, *53*, 162–171. https://doi.org/10.1016/j.labeco.2018.05.003

Cutler, D. M., Lleras-Muney, A., Vogl, T., & National Bureau of Economic Research. (2008). *Socioeconomic status and health : dimensions and mechanisms* (Ser. Nber working paper series, working paper 14333). National Bureau of Economic Research. INSERT-MISSING-URL.

Degenhardt, L., & Hall, W. (2001). The relationship between tobacco use, substance-use disorders and mental health: results from the national survey of mental health and well-being.

Glaser, R., & Kiecolt-Glaser, J. (2009). Stress damages immune system and health. *Discovery medicine*, *5*(26), 165-169.

Halpern, D. F. (2005). How time-flexible work policies can reduce stress, improve health, and save money. *Stress and Health*, *21*(3), 157–168. https://doi.org/10.1002/smi.1049

Hassmiller, K. M., Warner, K. E., Mendez, D., Levy, D. T., & Romano, E. (2003). Nondaily smokers: who are they? *American Journal of Public Health*, *93*(8), 1321–7.

Kamerāde D, Wang, S., Burchell, B., Balderson, S. U., & Coutts, A. (2019). A shorter working week for everyone: how much paid work is needed for mental health and well-being? *Social Science & Medicine (1982)*, *241*, 112353–112353. https://doi.org/10.1016/j.socscimed.2019.06.006

Kleiner, S., Schunck, R., & Schömann Klaus. (2015). Different contexts, different effects? work time and mental health in the united states and germany. *Journal of Health and Social Behavior*, *56*(1), 98–113.

McDonald, P., Bradley, L., & Brown, K. (2009). 'full-time is a given here': part-time versus full-time job quality. *British Journal of Management*, *20*(2), 143–143.

Muñoz de Bustillo, R., Fernández, E. and Antón, J. (2008), El trabajo a tiempo parcial en España en el contexto de la Unión Europea: características, condiciones de trabajo y perspectivas, Madrid: Ministerio de Trabajo e Inmigración.

NOS. (2019, December 14). *Vakbond wil 30-urige werkweek, hoeveel werken we nu dan eigenlijk?* From NOS: nos.nl

OECD. (2020). *Oecd labour force statistics 2020*. https://doi.org/10.1787/5842cc7f-en.

Pasman Joëlle A, Smit, D. J. A., Kingma, L., Vink, J. M., Treur, J. L., & Verweij, K. J. H. (2020). Causal relationships between substance use and insomnia. *Drug and Alcohol Dependence*, *214*. https://doi.org/10.1016/j.drugalcdep.2020.108151

Picchio, M., & Ours, J. C. van. (2020). Mental health effects of retirement. *De Economist : Netherlands Economic Review*, *168*(3), 419–452. https://doi.org/10.1007/s10645-020-09369-8

Researchers from university of valladolid report details of new studies and findings in the area of public economics (european part-time workers' health and well-being in times of crisis. the case of female part-timers).(report). (2021). *Politics & Government Week*, *518*, 518–518.

Rosenthal, L., Carroll-Scott, A., Earnshaw, V. A., Santilli, A., & Ickovics, J. R. (2012). The importance of full-time work for urban adults' mental and physical health. Social Science & Medicine (1982), 75(9), 1692–6. https://doi.org/10.1016/j.socscimed.2012.07.003

Sato, K., Kuroda, S., & Owan, H. (2020). Mental health effects of long work hours, night and weekend work, and short rest periods. *Social Science & Medicine (1982)*, *246*, 112774–112774. https://doi.org/10.1016/j.socscimed.2019.112774

Schluter, P. J., Turner, C., & Benefer, C. (2012). Long working hours and alcohol risk among australian and new zealand nurses and midwives: a cross-sectional study. International Journal of Nursing Studies, 49(6), 701–9. https://doi.org/10.1016/j.ijnurstu.2012.01.005

Sparks, K., Cooper, C., Fried, Y., & Shirom, A. (1997). The effects of hours of work on health: a meta-analytic review. *Journal of Occupational and Organizational Psychology*, *70*(4), 391–408. https://doi.org/10.1111/j.2044-8325.1997.tb00656.x

U, S., L.D, G., & M, W. (2014). Duration and optimal number of shifts in the labour market. *Applied Economics Letters*, *21*(6), 429–432. https://doi.org/10.1080/13504851.2013.864027

Virtanen, M., Jokela, M., Nyberg, S. T., Madsen, I. E. H., Lallukka, T., Ahola, K., Alfredsson, L., Batty, G. D., Bjorner, J. B., Borritz, M., Burr, H., Casini, A., Clays, E., De Bacquer, D., Dragano, N., Erbel, R., Ferrie, J. E., Fransson, E. I., Hamer, M., … Kivimaki, M. (2015). Long working hours and alcohol use: systematic review and meta-analysis of published studies and unpublished individual participant data. Bmj, 350(Jan12 13), 7772. https://doi.org/10.1136/bmj.g7772

Visser, J. (2002). The first part-time economy in the world: a model to be followed? *Journal of European Social Policy*, *12*(1), 23–42.

Wiesbeck, Kuhl, Yaldizli, & Wurst. (2008). Tobacco smoking and depression - results from the who/isbra study. *Neuropsychobiology*, *57*(1-2), 26–31.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data* (2nd ed.). MIT Press.

8. Appendix

Table A1: Means of the dependent variables by job hours categories for females and males.

Number of cigarettes	MHI-5		Number of glasses		Days of alcohol consumption		Number of cigarettes	
	Female	Male	Female	Male	Female	Male	Female	Male
0-16h	72.196	74.200	1.749	4.752	1.573	2.242	2.749	2.225
17-32h	73.928	74.369	1.568	3.274	1.765	2.655	3.147	4.145
33-48h	73.563	77.099	1.771	3.334	1.685	2.430	3.275	3.669
49h+	72.567	77.814	2.225	3.409	2.112	2.664	3.989	4.096
Total	**73.377**	**76.615**	**1.687**	**3.452**	**1.710**	**2.479**	**3.116**	**3.678**

Table A2: Fixed Effects model of the MHI5 health index on working hours for males and females

		MHI5					
		Female			Male		
		(1)	(2)	(3)	(1)	(2)	(3)
Job hours level	17-32h	.092 (.545)	-	-.153 (.457)	-.228 (.801)	-	.176 (.714)
	33-48h	.333 (.676)	-	.496 (.556)	-.864 (.783)	-	-.344 (.686)
	49h+	-1.578 (.772)	-	-.188 (.625)	-.938 (.875)	-	-.837 (.755)
Job hours level (t-1)	17-32h	-.874 (.561)	-.862 (.572)	-	-.367 (.875)	-.474 (.661)	-
	33-48h	-1.238* (.686)	-1.223* (.703)	-	-.084 (.672)	-.302 (.661)	-
	49h+	-1.621 (.722)	-1.756 (.715)	-	-.278 (.781)	-.500 (.772)	-
	Age	.220*** (.054)	.221*** (0.531)	.286*** (.044)	.060 (.050)	.064 (.050)	.112** (.044)
	Married	1.654 (.966)	1.649* (.967)	.548 (.778)	.911 (.369)	.886 (1.016)	.627 (.833)
	Kids	-1.090 (.668)	-1.010* (.662)	-.493 (.566)	-1.989*** (.656)	-1.974*** (.655)	-1.697*** (.617)
Education category	Middle	1.141 (1.367)	1.164 (1.373)	2.246** (.945)	1.886 (1.323)	1.861 (1.328)	.041 (.959)
	High	1.953 (1.563)	1.244 (1.561)	2.857** (1.232)	3.140** (1.461)	2.858** (1.445)	2.212 (1.252)
Household income	1501-3000 EUR	.519 (.763)	.525 (.760)	.847 (.636)	2.129** (.936)	2.071** (.928)	1.125 (.790)
	3001-5000 EUR	.978 (.880)	.980 (.874)	.737 (.719)	1.989** (1.004)	1.918* (.999)	.938 (.849)
	5001EUR+	.829 (.984)	.831 (.977)	.610 (.820)	1.988* (1.121)	.1.897* (1.109)	1.262 (.932)
	Constant	63.202*** (2.462)	63.207*** (2.461)	58.395*** (1.987)	71.805*** (2.696)	71.287** (2.628)	70.445*** (2.183)
	Observations		11,969			10,808	
	Individuals		3,222			2,730	
	R-Squared	0.0260	0.0142	0.0283	.0258	0.0162	0.0142

Note. Significance levels: ***p<0.01, **p<0.05, *p<0.1, SE in parentheses
The R-Squared describes the within R-Squared
Model (1) includes both contemporaneous and lagged explanatory variables, (2) only lagged explanatory variables and (3) only contemporaneous explanatory variables.

Table A3: Fixed Effects model of the number of alcohol units on the heaviest drinking day in the past seven days for males and females

		Alcohol quantity					
		Female			Male		
		(1)	(2)	(3)	(1)	(2)	(3)
Job hours level	17-32h	.109	-	.077	-.105	-	-.339
		(.083)		(.074)	(.228)		(.213)
	33-48h	.164	-	.186**	.077	-	-.191
		(.112)		(.093)	(.743)		(.209)
	49h+	.315	-	.170	.411	-	.113
		(.192)		(.158)	(.120)		(.235)
Job hours level (t-1)	17-32h	-.078	-.062	-	-.345*	-.312	-
		(.079)	(.080)		(.196)	(.199)	
	33-48h	-.071	.101	-	-.323*	-.261	-
		(.106)	(.103)		(.098)	(.198)	
	49h+	-.114	-.062	-	-.426**	-.344	-
		(.193)	(.186)		(.215)	(.219)	
	Age	-.013***	-.013**	-.017***	-.078***	-.081***	-.073***
		(.006)	(.006)	(.005)	(.012)	(.012)	(.010)
	Married	-.396**	-	-.476***	-.088	-.089	-.142
		(.109)	.401***	(.104)	(.213)	(.215)	(.183)
			(.109)				
	Kids	-.049	.033	.0157	-.065	.069	-.059
		(.101)	(.010)	(.089)	(.153)	(.155)	(.146)
Education category	Middle	.086	.092	.281	-.189	-.199	.775*
		(.224)	(.225)	(.188)	(.499)	(.501)	(.397)
	High	-.074	-.018	.090	-.694	-.663	.614
		(.262)	(.264)	(.223)	(.186)	(.540)	(.430)
Household income	1501-3000 EUR	-.264***	-.252**	-.265***	-.274	-.269	-.485**
		(.109)	(.109)	(.114)	(.258)	(.257)	(.228
	3001-5000 EUR	-.300**	-.278**	-.305***	-.346	-.332	-.501**
		(.126)	(.125)	(.114)	(.270)	(.270)	(.239)
	5001EUR+	-.265**	-.244*	-.207**	-.405	-.388	-.428*
		(.139)	(.138)	(.123)	(.293)	(.292)	(.260)
	Constant	2.578***	2.633	2.671***	7.929***	8.069***	6.939***
		(.364)	(.362)	(.320)	(.768)	(.720)	(.642)
	Observations		11,969			10,808	
	Individuals		3,222			2,730	
	R-Squared	0.0088	0.0094	0.0130	0.0186	0.0186	0.0250

Note. Significance levels: ***p<0.01, **p<0.05, *p<0.1, SE in parentheses
The R-Squared describes the within R-Squared
Model (1) includes both contemporaneous and lagged explanatory variables, (2) only lagged explanatory variables and (3) only contemporaneous explanatory variables.

Table A4: Fixed Effects model of the frequency of drinking in the past seven days for males and females

		Alcohol frequency					
		Female			Male		
		(1)	(2)	(3)	(1)	(2)	(3)
Job hours level	17-32h	.048	-	.030	-.028	-	-0.097
		(.053)		(.046)	(.010)		(.087)
	33-48h	.115*	-	.071	.076	-	.074
		(.063)		(.054)	(.092)		(.079)
	49h+	.257**	-	.139	.121	-	.158*
		(.121)		(.105)	(.107)		(.093)
Job hours level (t-1)	17-32h	-.046	-.038	-	.046	.058	-
		(.053)	(.053)		(.092)	(.091)	
	33-48h	.011	.034	-	.150*	.179**	-
		(.063)	(.063)		(.081)	(.081)	
	49h+	-.022	.022	-	.196**	.228**	-
		(.114)	(.115)		(.095)	(.097)	
	Age	-.006	-.006	-.007	-.018***	-.019***	-.013**
		(.006)	(.006)	(.005)	(.006)	(.006)	(.005)
	Married	-.229***	-.234***	-.229***	.077	.078	.111
		(.077)	(0.077)	(.067)	(.099)	(.099)	(.081)
	Kids	.112	.098	.018	-.006	-.006	-.029
		(.139)	(0.075)	(0.062)	(.073)	(.073)	(.260)
Education category	Middle	.236	.238	.250**	-.123	-.123	.256**
		(.153)	(.165)	(.114)	(.159)	(.158)	(.127)
	High	.361**	.395**	.381***	-.120	-.097	.398***
		(.169)	(.169)	(.124)	(.191)	(.191)	(.155)
Household income	1501-3000 EUR	-.094	-.083	-.057	-.193*	-.188*	-.207**
		(.072)	(.072)	(.059)	(.106)	(.104)	(.087)
	3001-5000 EUR	-.154***	-.140**	-.102	-.238**	-.230**	-.211**
		(.079)	(.079)	(.067)	(.113)	(.126)	(.094)
	5001EUR+	-.178**	-.160**	-.078	-.211	-.202	-.148
		(.097)	(.097)	(.081)	(.128)	(.126)	(.108)
	Constant	1.897***	1.938***	1.918***	3.404***	3.454***	2.901***
		(.273)	.272	(.221)	(.000)	(.312)	(.260)
	Observations		11,969			10,808	
	Individuals		3,222			2,730	
	R-Squared	0.0116	0.0114	.0101	0.0497	.0506	0.0070

Note. Significance levels: ***p<0.01, **p<0.05, *p<0.1, SE in parentheses
The R-Squared describes the within R-Squared
Model (1) includes both contemporaneous and lagged explanatory variables, (2) only lagged explanatory variables and (3) only contemporaneous explanatory variables.

Table A5: Fixed Effects model of the average number of cigarettes smoked on a day for males and females

		Tobacco consumption					
		Female			Male		
		(1)	(2)	(3)	(1)	(2)	(3)
Job hours level	17-32h	.348*	-	.174	.074	-	.073
		(.192)		(.156)	(.322)		(.268)
	33-48h	.481**	-	.440**	.142	-	.265
		(.239)		(.196)	(.294)		(.236)
	49h+	.964**	-	.702**	.623*	-	.630**
		(.449)		(.366)	(.366)		(.290)
Job hours level (t-1)	17-32h	.183	.231	-	.092	.128	-
		(.192)	(.193)		(.341)	(.343)	
	33-48h	.512**	.601***	-	.340	.459	-
		(.239)	(.193)		(.304)	(.300)	
	49h+	.686	.841*	-	.422	.515	-
		(.461)	(.469)		(.345)	(.336)	
	Age	-.147***	-.147***	-.127***	-.155***	-.158***	-.124***
		(.018)	(.018)	(.015)	(.019)	(.019)	(.015)
	Married	-.463	-.147	-380	.159	.162	-.005
		(.346)	(.348)	(.290)	(.278)	(.278)	(.241)
	Kids	-.150	-.198	-.219	-.390*	-.387*	-.532*
		(.253)	(.859)	(.211)	(.211)	(.210)	(.190)
Education category	Middle	.172	.190	.406	-.432	-.438	.346
		(.416)	(.417)	(.263)	(.727)	(.730)	(.378)
	High	-.188	-.017	.018	-.293	-.225	.482
		(.501)	(.491)	(.358)	(.837)	(.822)	(.539)
Household income	1501-3000 EUR	-.034	.001	.037	-.418	-.410	-.457
		(.273)	(.274)	(.222)	(.389)	(.388)	(.323)
	3001-5000 EUR	-.194	-.137	-.162	-.447	-.428	-.371
		(.286)	(.287)	(.239)	(.410)	(.409)	(.347)
	5001EUR+	.365	.423	.319	-.420	-.394	-.384
		(.340)	(.334)	(.276)	(.436)	(.433)	.366
	Constant	9.277***	9.445***	8.490***	11.007***	11.251***	9.360***
		(.850)	(.860)	(.658)	(1.404)	(1.051)	.760
	Observations		11,969			10,808	
	Individuals		3,222			2,730	
	R-Squared	0.0053	0.0063	.0069	0.0035	0.0041	0.0069

Note. Significance levels: ***p<0.01, **p<0.05, *p<0.1, SE in parentheses
The R-Squared describes the within R-Squared
Model (1) includes both contemporaneous and lagged explanatory variables, (2) only lagged explanatory variables and (3) only contemporaneous explanatory variables.