

Working time and happiness in Dutch panel data

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Marion Collewet¹

Jaap de Koning²

Abstract

Increasing labour market participation and working time is high on the policy agenda in Europe. We estimate the effects of weekly working time on self-rated happiness of men and women aged 15 to 70. We estimate a fixed-effects model on the basis of 18 waves of a panel held among Dutch households. We find that working longer hours has a positive effect on the happiness of men working in big part-time and full-time jobs and no effect on women's happiness. Controlling for constraints on the labour supply of individuals does not affect these results. Controlling for the difference between individuals' working time and the working time of their acquaintances leads to changes in the results, and suggests that social norms might be playing a role.

Abstract.....	1
Introduction.....	2
Working hours and happiness in the economic literature.....	3
Data.....	6
Model and estimation method.....	8
Working hours and happiness.....	9
Working hours, happiness and stated preferences.....	13
Working hours, happiness and peers' labour supply.....	16
Conclusions.....	21
References.....	23
Annex 1 – Descriptive statistics.....	26
Annex 2 – Complementary estimation results.....	30

¹ Researcher at SEOR, Erasmus University Rotterdam.

² Director of SEOR and Professor of Labour Market Policy, Erasmus University Rotterdam.

Introduction

Increasing the number of hours worked, through an increase in labour market participation or through an increase in working time of part-time workers, is high on the policy agenda in a number of Western European countries. In France, 'Work more to earn more' ('Travailler plus pour gagner plus') was one of Nicolas Sarkozy's principal slogans in the campaign for the presidential election in 2007. In the Netherlands, policy makers are also looking for ways to increase labour market participation, not only in terms of the employment rate, as illustrated by the work of the 'Commission Labour Market Participation' ('Commissie Arbeidsparticipatie') in 2008, but also in terms of the number of hours worked by part-time workers, as illustrated by the 'Taskforce Part-time Plus' ('Taskforce Deeltijdplus'). Increasing the number of hours worked is seen as necessary to maintain our living standard in the context of population ageing and international competition. The emphasis on the *necessity* to work is in line with the standard assumption in textbook economics that work is a source of disutility in itself, but may in the end increase total utility through a positive income effect.

Another argument used in the policy discussion is, however, that working more is *in itself* good for the well-being of citizens: because of the social contacts which work brings, because work brings a structure and a meaning into an individual's life, etc. There is evidence that work involves more than just earning a living (see the studies cited below about the effects of unemployment on well-being; see De Koning et al. 2008 for a number of the factors mediating the relation between work and health). This is also one of the arguments to let people with small part-time jobs (mostly women) work more: it is seen as a means for emancipation, as it is seen to improve independence not only in the economic, but also in the social and psychological sense. In short, it is increasingly emphasized that work can have an 'intrinsic value', i.e. that people can simply like work for itself, because they like what they are doing and all the positive things associated with it (social contacts, self-realisation, etc.).

In this paper, we want to have a closer look at the relationship between working time and well-being, by putting people's weekly work duration in relationship with their self-rated happiness: Does working more really lead to a higher happiness at the individual level, even after controlling for the income effect? Is it possible to identify a turning point, from which working more hours eventually leads to a decrease in happiness? We also examine the role of constraints on the labour supply of individuals, to check the possibility that the relationship between working time and happiness is influenced more by the extent to which individuals are able to realize their preferred working time than by the number of hours worked itself. The 'intrinsic value' attributed to work by individuals may also be influenced by his or her peers' labour supply, either because free time as well as work are more enjoyable when shared with others (see for instance Hamermesh 2002), or because others' behaviour sets social norms, a deviation from which may lead to a loss in utility (see for instance Akerlof and Kranton 2010). To answer these questions and test these hypotheses, we estimate fixed-effects models on the basis of data from the DNB Household Survey, a panel held among Dutch households since

1993. In the remainder of this paper, we first discuss the way the relationship between working time and happiness is addressed in the economic literature. We then present the data we use for estimations, and discuss the model estimated and the estimation method used. The following sections contain our estimation results. The last section discusses the results and concludes.

Working hours and happiness in the economic literature

There is a whole body of economic literature estimating the relationship between work and individual self-rated happiness (see for instance Clark & Oswald 1994, Gerlach & Stephan 1996, Korpi 1997, Winkelmann & Winkelmann 1998, Wottiez & Theeuwes 1998, Frey & Stutzer 2000, Di Tella et al. 2001, Blanchflower & Oswald 2004, Carroll 2007). The main focus of the majority of these articles is however on the negative effects of unemployment on well-being (beyond the effects of the income loss) rather than on the effect of working vs. not-working. When the effect of working hours on well-being is studied in economic literature, it is often with a focus on job satisfaction (see for instance Clark 1996, Clark 1997, Groot & Maassen van den Brink 1999, van Praag et al. 2003, Booth & van Ours 2008, 2009, 2010). The effect of working time itself on individual self-rated happiness (or general life satisfaction) has been less examined.

The economic literature mostly looks at the link between working time and happiness in an implicit manner: by estimating labour supply functions. The idea behind this kind of studies is that individuals work a given number of hours for a given hourly wage in order to maximize their utility, so that the actually supplied amount of labour 'reveals' the point at which the marginal utility of an additional hour of work (for instance in terms of wage earned) is no longer bigger than the marginal utility of an additional hour of free time. This approach is useful to predict the behaviour of individuals, but using it to make conclusions about the link between working time and well-being can be problematic, be it alone because most employees in the real world are not free to choose from a continuum of possible working hours. Labour supply can be subject to a number of constraints, whether they come from the employer, characteristics of the household or the availability of work-facilitating services (such as child care, public transportation, etc.). Surveys of individuals in different countries reveal that a non-negligible part of working individuals would like to work more or less than they actually do (see Stewart and Swaffield (1997), Böheim and Taylor (2001) and Bryan (2002) for Great Britain, Illmakunnas and Pudney (1990) for Finland, Altonji and Parxson (1988) for the USA, Kahn and Lang (1991) and Drolet and Morissette (1997) for Canada, and Sousa-Poza and Henneberger (2002) for cross-country evidence). For the Dutch case, there is also clear evidence that part of the working population would ideally like to work different hours, even if different sources can give quite different results (see Baaijens 2005, Cloïn et al. 2010, Bekker et al. 2008). Answers to questions about desired working time are often considered with scepticism by economists, not least because it is not always

clear under which conditions respondents indicate that they would like to work more or less, what they assume about their hourly wage, the availability of child care, and all kinds of other relevant factors which may influence their labour supply. However, there is evidence that statements of individuals about their desired working hours have explanatory power. It has been shown that taking constraints on working hours into account gives a much better explanation of the actual working hours distribution (Van Soest et al. 1990, Dickens and Lundberg 1993). Euwals et al. (1998) conduct a test of whether reported desired hours can be considered as informative about individual behaviour, by measuring how much of future working hours they enable to predict, and conclude that subjective data is helpful for explaining female labour supply. Bijwaard et al. (2008) also find that discrepancies between desired and actual hours have a significant influence on the probability of making a transition to a new job which better matches one's preferences. This evidence suggests that it is not enough to estimate labour supply functions based on actual worked hours to get a good picture of the relationship between working hours and well-being, but that it may be worthwhile to have an explicit look at the relationship between hours and indicators of well-being, such as self-rated happiness.

Another inconvenient of focussing on labour supply functions to get information on individuals' valuation of work and working time is that such an approach most of the time primarily sees work as a means to earn income, as a disutility, and therefore does not account for any non-monetary positive effects of work on well-being³. Alesina et al. (2005), when estimating the relationship between happiness and annual hours of work on the basis of OECD and Eurobarometer data, find a negative relationship between hours and happiness, and state: 'Note that we NEVER include a measure of income of the respondent; everybody should be happier working less holding income constant!' (p. 30). The current emphasis on the intrinsic value of work is in contradiction with this assumption. We are interested in having a closer look at it. The other (few) existing studies examining the relationship between working time and happiness always include controls for income as part of their analytical strategy, in order to capture this 'intrinsic value' of work. Pouwels et al. (2008) estimate the effect of working hours and income on life satisfaction of married and cohabiting couples with both partners of working age and not unemployed, disabled or retired. They find that working hours have a significant negative effect on happiness for men, and that controlling for working time significantly increases the positive effect of income on happiness for men. They however use only one wave of the German Socio-Economic Panel. Knabe and Rätzl (2010) re-examine these findings using eight waves of the same panel. They estimate an ordered logit with individual fixed effects and include a quadratic hours term to account for a possible inverted U-shape in the effect of hours on well-being. They find such an

³ Assuming utility-maximizing individuals does not in itself imply that work provides less utility than free time. In theory, it is possible that work raises an individual's utility more than free time, at least for a certain range of the possible work-leisure combinations. But this possibility is often ignored. In any case, one has to assume that the utility of free time gets bigger than that of work above a given point, otherwise the optimal amount of free time would become 0, which is quite implausible.

inverted U-shaped effect, but it is not significant. They further do not find that the impact of income on happiness changes when weekly working hours are included in the model. Booth and van Ours examine the relationship between working time and well-being within couples on the basis of the British Household Panel Survey (2008) of the Household, Income and Labor Dynamics in Australia panel (2009) and of the Dutch CentER data panel (2010). In the first case, they find no significant relationship between the number of hours worked and life satisfaction. In the second case, they conclude that working more than 35 hours a week has a significant negative effect on the life satisfaction of women, and that the life satisfaction of men significantly increases if they work between 35 and 50 hours a week. In the third case, they estimate that men are happier if they work more than 20 hours a week, but this effect disappears when income is included in the model. Women's life satisfaction appears to be barely affected by their working hours (only working more than 40 hours a week has a negative effect when income is taken up as a control variable). Booth and van Ours (2009) also estimate the effect of working part-time vs. full-time on self-rated life satisfaction and find that working fulltime has a negative and significant effect on women's life satisfaction, while it has a positive and significant effect on the life satisfaction of men. Willson and Dickerson (2010), who examine the relationship between part-time work and life satisfaction for employed mothers aged between 25 and 50 with children aged below 12 on the basis of data from the British Household Panel Survey, find no significant influence of working part-time rather than full-time on self-rated life satisfaction. All studies named so far focus on a specific group: mostly partnered individuals, or women with children in the case of Willson and Dickerson (2010). Rätzel (2009) estimates the effect of working hours on life satisfaction of working individuals between 18 and 60 on the basis of the German Socio-Economic Panel. He finds that the utility that working individuals derive from work increases with working hours, up to a given threshold, from which it decreases again as working hours increase: the maximum is found to be at 8 hours a day for men, and at 4 hours a day for women (but the effect of working hours is not significant for them). Muffels & Kemperman (2011) focus on all women aged between 20 and 55 in the GSOEP and also find an inverted U-shaped relationship between the sum of time spent on paid work and care in a week and their well-being. Having something to do, working or caring, rather than nothing, increases women's well-being, it can also be the case for the combination of work and care, but this is only true up to a given threshold, from which on time pressure exerts a downward pressure on well-being. This paper builds forth on this literature, providing an estimation of the relationship between worked hours and self-rated happiness based on all working-age individuals (15 to 70) (both working and non-working, partnered and non-partnered) in the Dutch DNB Household Survey.

In the above, we emphasized the role of constraints on labour supply for the estimation of the relationship between working hours and well-being. It seems interesting to have an explicit look at how these constraints influence self-rated happiness and at their effect on the relationship between

work hours and self-rated happiness. One would expect constraints to have a negative effect on individual well-being. Rätzel (2009) finds evidence that being overemployed has a significant negative effect on self-rated life satisfaction, and that underemployment also has a negative, but much less significant effect. Golden and Wiens-Tuers (2006) find no effect of overtime, both mandatory and non-mandatory, on self-rated happiness. They do not, however, control for income, so that the positive effect of overtime on well-being through income might offset other negative effects of mandatory overtime. It also seems plausible that the relationship between working hours and well-being would be different for individuals who are underemployed, overemployed, or satisfied with their own working hours. One could even imagine that, if preferences vary a lot among individuals, hours themselves do not have a significant effect on well-being once constraints on the labour supply are controlled for, because individuals' happiness would only be affected by their ability to realize their own, very diverse, preferences.

The 'intrinsic value' of work is the focus of this paper. A number of aspects contributing to this intrinsic value have been named in the introduction: social contacts, self-realization, etc. One can imagine that the value which one attributes to work and to free time respectively will be dependent on the social environment one lives in. Social contacts are an important aspect not only of work, but also of free time. Working alone or relaxing alone is arguably less enjoyable than working or relaxing together with others: there is evidence that individuals coordinate their working hours to have common free time within the household (Hamermesh 2002) and within regions (Jenkins & Osberg 2005). Alesina et al. (2005) present a simple model accounting for what they call this 'social multiplier' effect. Further, whether a person sees work as a form of self-realization will be strongly dependent on what is socially accepted in her environment, and the 'intrinsic value' he or she attributes to work will depend on how much people in the group he or she belongs to are expected to work (see Akerlof and Kranton 2000, 2010). On the basis of the DNB Household Survey, it is possible to test this possibility, because respondents are asked about the labour supply of men and women among their acquaintances. It is interesting to study how the difference between own and peers' hours influences happiness, and whether it has an effect on how people value their own working time.

Data

We use the DNB Household Survey, a panel held since 1993 among about Dutch households. The information is collected through a number of different modules: work and retirement, housing and mortgage, income and health, assets and debts, and economic and psychological concepts. We use information from respondents who have participated in the modules work and pensions, income and health, and economic and psychological concepts. These three modules contain information about working time, different indicators for income, self-rated health and happiness, and the respondent's

perception of the income and working hours of his or her peers. We use information collected in the years 1993 to 2010, in more than 8000 households. The estimation sample for our basic model consists of about 3800 men and 3300 women, about 17 000 observations in total. The dependent variable in our analysis is the self-rated happiness of the respondents, as measured by the question: ‘All in all, to what extent do you consider yourself a happy person?’, to which they could answer by choosing from one of the following six possibilities: “very happy”; “happy”; “neither happy nor unhappy”; “unhappy”; “very unhappy”; “don’t know”⁴. The number of hours which respondents work is registered through a number of questions, on their normal (contractual) weekly working hours, their usual working hours, and any additional hours which they work in a second job. To measure weekly working time, we add up usual hours and hours worked in second jobs. We excluded from the estimation sample individuals who indicated that they work 90 hours per week or more, for reasons of credibility. Dropping those observations does not influence the results obtained. Constraints on working time are measured using two questions: ‘How many hours would you like to work in total? If you have more than one job, give the sum total for all jobs.’, which was asked to working individuals, and ‘How many hours per week would you like to work?’, which was asked to individuals not working but looking for a job. For individuals who did not work and were not looking for a job, desired working time was set to zero. We are aware that this might be wrong in the case of discouraged workers etc. We have however no means to identify individuals who would like to work but are not looking for a job, and even less to know what their ideal working time would be. The labour supply of people in the environment of the respondents was measured using the question: ‘If you think of the men (women) among your acquaintances, how many hours per week do they work on average?’.

Before proceeding to estimating the effects of working hours on happiness, we give a first descriptive account of the data and the observed links between crucial variables in our analysis. Descriptive statistics are taken up in Annex 1. First of all, it is striking that two thirds of the respondents indicate that they are ‘happy’, and less than 2 percent of the respondents found themselves ‘unhappy’ or ‘very unhappy’ (see Table 6). One can also suppose that this is for a part due to a social desirability bias. This means in any case that the variation in our dependent variable is not very big. Figure 1 and 2 present the average self-rated happiness of men and women depending on the number of hours which they work. For men, happiness decreases with working time for short hours and is the lowest for medium part-time jobs. For longer hours, working longer hours always goes together with a higher average happiness. For women, the pattern is less clear: happiness first increases with working time, is highest for women in medium part-time jobs, lower for women with big part-time jobs and longer

⁴ Those who answered that they ‘don’t know’ were excluded from the sample. These are 114 observations in the dataset. They did not appear to belong to a particular group in terms of gender, age, labour market status, education level, etc.

hours, but appears to increase again for around 60 hours per week and to decrease above this limit. The fact that the patterns are so different for men and women means that we will conduct separate estimations for men and women throughout the analysis. Figure 3 and 4 give the distribution of actual, desired and peers' hours for men and women.

Model and estimation method

The hypothesis which we would like to test in this paper is that working more hours has in itself a positive effect on well-being (beyond the positive effect resulting from the effect on income, and because of positive aspects of work as social contacts, self-realisation, structure in life, etc.) as long as hours remain below a given threshold, and a negative effect when hours increase above this threshold (meaning that people can work 'too much' because above this threshold, an extra hour of leisure would increase their total utility more than an extra hour of work). This means that we expect to find an inverted U-shaped relationship between working hours and well-being, after controlling for a number of important factors as income, health and a number of household characteristics. To do so, we estimate models which include an individual-specific, time-invariant constant. Earlier research has demonstrated that in studies of self-reported happiness, it is crucial to take individual-specific effects into account. Lykken and Tellegen (1996) find on the basis of a study on twins that a substantial part of variation in self-rated well-being can be explained by genetic factors. Below, we present the results of two different models. First, we estimate an OLS model with individual fixed effects. Second, we estimate a logit model with fixed-effects as developed by Ferrer-i-Carbonell & Frijters (2004), to account for the discrete character of the independent variable⁵. Ferrer-i-Carbonell & Frijters find that it is more important to account for individual heterogeneity than for non-cardinality of the self-rated well-being indicator when trying to explain happiness. An important drawback of their model is that individuals for which the dependent variable, self-rated happiness, does not change over time, have to be dropped from the estimation sample. Not only does this result in an important loss of observations, it also leads to potential selection effects, as people who rate themselves 'happy' are less likely to experience a change in their level of happiness over time than people who are closer to extremes (see Table 7 in Annex 1). Our favoured specification is therefore the fixed-effects OLS model. We nevertheless present the results of the estimation using the technique by Ferrer-i-Carbonell & Frijters to check for the effect of treating the dependent variable as continuous.

We estimate the following model: $U_{it} = \beta_0 + \beta_1 H_{it} + \beta_2 Y_{it} + \sum_j \gamma_j X_{j,it} + \mu_i + \varepsilon_{it}$, where U_{it} is the self-rated happiness of individual i in period t , H is the number of weekly hours worked, Y is the

⁵ We use a Stata-program developed by Ingo Geishecker and Maximilian Riedl (see Geishecker & Riedl 2010). We are grateful to Maximilian Riedl for the support provided on the use of this program.

natural logarithm of the net household income available per person (where an additional person counts for 0.8, to allow for economies of scale at household level), and X stands for additional control variables: whether the respondent is looking for another job (as a proxy for job satisfaction)⁶, the self-rated health of the respondent, his or her age (in linear and quadratic form), the number of children in the household, and a dummy for the presence of a partner. To get a better insight in the shape of the relationship between hours and self-rated happiness, we allow β_1 to vary with the level of hours, by estimating a piecewise linear model, in which the effect of an additional hour of work on happiness is dependent on whether an individual works from 1 to 16 hours a week (small part-time job), from 17 to 32 hours (medium part-time jobs), 33 to 40 hours (big part-time jobs and full-time jobs), 41 to 48 hours (full-time jobs with overtime) or more than 48 hours a week (very long hours). Working 0 hours a week is used as the reference case.⁷

Working hours and happiness

The estimation results of the model measuring the effects of weekly working time on self-rated happiness are presented in table 1 below. For men, we find that working more leads to an increase in happiness, all other things (except, of course, free time) being equal, for men working 33 hours a week or more. The positive effect of working longer hours is the highest for men working between 41 and 48 hours a week. This effect remains positive and significant for men working very long hours (more than 48 a week), which is a surprising result. For women, we find no significant effect of working time on self-rated happiness. It is important to note that looking for another job (which we use as a proxy for job satisfaction) has a strong and significantly negative effect on self-rated happiness of men. This effect is much stronger than the effect of the number of hours worked, meaning that the former offsets the latter effect for individuals who are not satisfied with their job. As regards the other control variables, we find that log income per person in the household has in general a positive, but insignificant effect on happiness⁸. This is consistent with the findings of Booth and van Ours (2010), who did not find a significant effect of family income either, using the same dataset. The respondents'

⁶ We consider as looking for another job individuals who answer to the question "Are you looking for a(nother) job at the moment?": "yes, I am seriously looking for a(nother) job", "yes, I am thinking about looking for a(nother) job" and "no, I have already found another job but I haven't started working there yet". The variable is set automatically to 0 for non-working individuals, and can therefore be considered as a cross-term of working and looking for another job.

⁷ We first estimated the model with a linear and a quadratic term in hours, but we did not find evidence of a significant inverse U-shaped relationship between working hours and well-being. For men, we found that the linear hours term has a significant and positive effect on self-rated happiness. A quadratic term in hours, when introduced in the model, did not turn out to have a negative coefficient. For women, weekly working hours did not appear to have any effect on self-rated happiness: the estimated coefficients were positive, but very small and insignificant.

⁸ We note that the number of children is strongly correlated with household income per person, and that leaving this variable out results in a significant effect of the income variable in some cases. This does not however affect the coefficients on the hour terms, which are in the focus of our analysis, in any of the models presented in this paper.

subjective valuation of their own health is always found to have a positive and significant effect on happiness, as well as the presence of a partner in the household. These two variables have the biggest impact on happiness in all models, for both men and women. The relationship between age and happiness is not very significant, but there is evidence of a U-shaped relationship with a minimum ranging from 21 years for men in the fixed-effects model to 38 years for women in the FCF estimation. The latter is the only case in which both age terms are found to be significant. The number of children in the household has a negative effect on the happiness of men. It has no significant effect on women's happiness. We find that the results from the fixed-effects model with a continuous happiness variable are qualitatively very similar to the results from estimation of the model developed by Ferrer-i-Carbonell & Frijters (2004). This is in line with the findings of those authors.

In general, the effect of worked hours on happiness estimated here is in line with the results found in other studies (cited above): weekly working time is often found to have little influence on women's happiness, and men are in general found to be happier when working full-time. It is however surprising that in our estimations, even men working very long hours (more than 48 hours a week) are found to become happier when working more. Having a closer look at the characteristics of men working more than 48 hours a week in our estimation sample reveals that it is a group with specific characteristics. Their probability of being self-employed and of having a second job is twice as high as on average in the sample. This suggests that they have deliberately chosen to work so much. 56 percent of them are highly educated, compared to 41 percent in the total sample.⁹ Further, those working more than 48 hours a week are overrepresented in the age group 35 to 55 and in the upper half of the income distribution.¹⁰

To get a more complete picture of the link between working hours and happiness, we also estimate the model for different age groups (see Table 8 in Annex 2). We split our sample in 10-year age groups, from 15-25 to 65 and older¹¹. For men, we find that the positive significant effect of long working hours on happiness is concentrated in the group aged 35 to 65. For men older than 65, very long working hours do no longer have a positive effect on happiness. For men between 25 and 35, working

⁹ Unfortunately, the DNB Household Survey does not contain enough information about sector and occupation to make an analysis on the basis of these characteristics possible.

¹⁰ When looking at the *dfbeta*'s for the coefficient on very long hours, we find that 388 observations have a significant effect on the estimated coefficient, of which 194 come from individuals working very long hours and 160 from non-working individuals. Those observations mainly differ from other observations by their score on the self-rated happiness variable: more than 75 percent of the 160 observations for non-working individuals score 'neither happy nor unhappy', and almost all (189) of the 194 observations for individuals working very long hours score 'very happy'. This group of 'very happy workoholics' does appear to have specific characteristics: half of them is highly educated (and a third has a medium education level), and they are overrepresented in high income deciles. When excluding the latter group, we find that the term for very long hours no longer has a significant effect on self-rated happiness. It is no surprise that dropping 'very happy workoholics' leads to a loss of significance in the variable for very long hours, but we do not see any good reason for dropping this group.

¹¹ In the later group, we include all individuals older than 65, including those older than 70.

hours do not appear to have any significant effect on happiness. For both men and women, the group aged 15 to 25 is quite small (around 500 observations), so that the estimated effects are barely significant and probably not very reliable. For women, we do not find significant effect of working hours on happiness for any age group (except for a difficult to explain positive effect of very long working hours in the group aged 15 to 25).

Table 9 in Annex 2 also presents estimations of the basic model for men and women by education levels. For men, working full-time and more only has a positive and significant effect on well-being for those who received middle and high education. For the low educated, working full-time or very long hours no longer has a significant impact on happiness, and hours in a big part-time job even have a negative and significant effect. It is no surprising result that people with higher education levels seem to enjoy working more than the low-educated, since they are likely to have jobs with more desirable characteristics. It is interesting to note that the effect of working hours is biggest and most significant for the group with intermediary education. This might be explained by a drive in this group to work themselves up towards a higher status. Job satisfaction is also only significant for those with intermediary education. This is not due to a stronger variation in job satisfaction within this group. As far as women are concerned, we also observe variation in the effect of working time across education levels. For the low educated, we find that working time has a negative and significant effect on happiness for those working in small part-time jobs. These may be jobs with low status and less desirable working conditions. Women with intermediary education experience a decrease in happiness as working time increases if they work in big part-time jobs. Women with a high education level, however, get happier if they work more in small part-time jobs or in full-time jobs with overtime. As for men, this may be explain by the fact that the higher educated are likely to hold more enjoyable jobs. Splitting up the sample by education levels reveals that the insignificant effect of hours on well-being for all women probably results from very different effects ‘cancelling out’ each other.

Table 1 Estimation of the effect of working time on happiness for men and women

	Men fixed effects			FCF			Women fixed effects			FCF		
n observations	9567			3964			7631			3091		
n individuals	3767			865			3271			734		
R ²	0.1162			0.0491			0.0672			0.0184		
log likelihood				-1453.23						-1141.36		
	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value
log real income per person	0.0181	0.87	0.382	0.2187	1.50	0.132	0.0168	0.67	0.506	0.1391	0.85	0.398
work 1 to 16 hours	-0.0007	-0.17	0.863	0.0139	0.55	0.584	0.0028	0.93	0.352	0.0162	0.78	0.434
work 17 to 32 hours	-0.0018	-1.40	0.160	-0.0046	-0.54	0.592	0.0006	0.50	0.616	0.0037	0.44	0.657
work 33 to 40 hours	0.0019	2.71	0.007	0.0179	3.68	0.000	-0.0009	-0.90	0.367	-0.0049	-0.70	0.482
work 41 to 48 hours	0.0023	3.42	0.001	0.0200	4.28	0.000	0.0000	0.02	0.982	0.0016	0.22	0.827
work > 48 hours	0.0020	3.25	0.001	0.0176	3.86	0.000	-0.0005	-0.45	0.651	-0.0046	-0.61	0.541
looking for other job	-0.0520	-2.64	0.008	-0.4369	-3.28	0.001	-0.0064	-0.27	0.791	0.0356	0.22	0.823
self-rated health	0.0929	7.21	0.000	0.5632	6.39	0.000	0.0574	3.91	0.000	0.2679	2.96	0.003
age	-0.0085	-0.84	0.403	-0.0627	-0.91	0.365	-0.0114	-1.01	0.312	-0.1296	-1.73	0.085
age ²	0.0002	1.66	0.097	0.0013	1.98	0.048	0.0002	1.54	0.124	0.0017	2.29	0.022
n of children	-0.0442	-2.39	0.017	-0.2253	-1.81	0.071	0.0116	0.50	0.615	-0.0049	-0.03	0.976
partner	0.3468	7.31	0.000	1.8931	5.40	0.000	0.3504	5.49	0.000	1.7174	3.99	0.000
constant	3.1798	10.53	0.000				3.5026	9.97	0.000			
rho	0.6341						0.6392					

Working hours, happiness and stated preferences

In our discussion of the economic literature about working time and happiness, we emphasized the possible influence of constraints on the labour supply. Taking into account the discrepancy between the respondents' actual and desired hours of work may also help explain some of the findings presented above. For instance, the positive relationship between very long working hours and happiness for men could be due to the fact that Dutch men who work very long hours are those who are happy to do so, and are very satisfied with their job and their life in general. Evidence presented above suggests that those working very long hours choose to do so. In the case of women, the absence of a significant relationship between working hours and happiness for the overall sample may also be due to the fact that what matters to women is not their actual working time, but the extent to which they are able to work their preferred number of hours.

We first estimate the effect of the extent of over- and underemployment of the respondents (i.e. the absolute number of hours than an individual would like to work more or less than he or she actually does) on their happiness, and then include over- and underemployment in the model estimating the effect of weekly working time on happiness. The estimation results are presented in table 2 and 3. For men, overemployment appears not to have any significant effect on happiness. Its coefficient reverts from positive to negative when weekly working time is taken up in the model, which suggests that it captures some positive effect of hours when hours themselves are not included. Underemployment has a negative significant effect on the happiness of men. This effect however loses of its significance when weekly working time is included. The coefficients on the hour terms do not change much when over- and underemployment are included in the model. This suggests that constraints on the labour supply do not play an important role in the relationship between working time and happiness for men, and that hours rather have an influence of themselves on men's well-being. As far as women are concerned, overemployment has a negative and (weakly) significant effect on happiness. However, this effect loses its significance when working time is included in the model. Underemployment has a negative, but insignificant effect. The coefficients on working time remain insignificant when over- and underemployment are included in the model. Just as for men, this suggests that the link between work hours and happiness is not much influenced by constraints on the labour supply in our dataset. Comparing our findings with those of Rätzel (2009), we see that the coefficients on the hour terms in his model do change more than ours when he includes over- and underemployment. He also finds a more significant effect on happiness of overemployment than of underemployment, both for men and women, whereas we find a more significant effect of underemployment for men. It is unclear whether this reflects real differences between the Dutch and the German situation, or whether it can be explained by characteristics of the datasets used. As in the basic model, OLS fixed-effects and the Ferrer-i-Carbonell & Frijters technique lead to qualitatively very similar results.

Table 2 Estimation of the effect of working time on happiness for men, including over- and underemployment

	fixed-effects			FCF								
n observations	9542			9542			3940			3940		
n individuals	3760			3760			858			858		
R ²	0.1143			0.1167			0.0447			0.0512		
log likelihood							-1452.4			-1442.5		
	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value
log real income per person	0.0213	1.03	0.305	0.0200	0.97	0.335	0.2448	1.69	0.091	0.2394	1.64	0.100
work 1 to 16 hours				-0.0004	-0.12	0.908				0.0137	0.54	0.591
work 17 to 32 hours				-0.0020	-1.50	0.133				-0.0066	-0.74	0.459
work 33 to 40 hours				0.0017	2.13	0.033				0.0155	2.83	0.005
work 41 to 48 hours				0.0021	2.77	0.006				0.0179	3.33	0.001
work > 48 hours				0.0019	2.67	0.008				0.0160	3.02	0.002
overemp	0.0006	0.84	0.404	-0.0004	-0.45	0.649	0.0070	1.40	0.162	-0.0007	-0.12	0.902
underemp	-0.0031	-2.92	0.004	-0.0019	-1.66	0.097	-0.0246	-3.41	0.001	-0.0147	-1.84	0.066
looking for other job	-0.0519	-2.64	0.008	-0.0525	-2.67	0.008	-0.4277	-3.22	0.001	-0.4465	-3.33	0.001
self-rated health	0.0938	7.26	0.000	0.0929	7.20	0.000	0.5815	6.59	0.000	0.5750	6.47	0.000
age	-0.0027	-0.27	0.789	-0.0076	-0.74	0.457	-0.0089	-0.13	0.896	-0.0517	-0.74	0.460
age ²	0.0001	0.86	0.390	0.0002	1.52	0.128	0.0006	0.90	0.368	0.0012	1.75	0.080
n of children	-0.0388	-2.10	0.036	-0.0435	-2.35	0.019	-0.1804	-1.45	0.147	-0.2175	-1.74	0.082
partner	0.3444	7.25	0.000	0.3455	7.28	0.000	1.9046	5.44	0.000	1.8905	5.38	0.000
constant	3.1209	10.36	0.000	3.1597	10.46	0.000						
rho	0.6345			0.6348								

Table 3 Estimation of the effect of working time on happiness for women, including over- and underemployment

	fixed effects			FCF								
n observations	7605			7605			3072			3072		
n individuals	3265			3265			729			729		
R ²	0.0711			0.0714			0.0193			0.0206		
log likelihood							-1133.5			-1132.02		
	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value
log real income per person	0.0238	0.93	0.351	0.0235	0.92	0.358	0.2204	1.31	0.190	0.2130	1.26	0.207
work 1 to 16 hours				0.0032	1.08	0.282				0.0193	0.92	0.355
work 17 to 32 hours				0.0010	0.75	0.451				0.0047	0.53	0.596
work 33 to 40 hours				-0.0006	-0.47	0.637				-0.0030	-0.39	0.693
work 41 to 48 hours				0.0006	0.49	0.625				0.0053	0.63	0.529
work > 48 hours				0.0003	0.20	0.843				0.0003	0.04	0.972
overemp	-0.0022	-1.63	0.104	-0.0023	-1.46	0.146	-0.0160	-1.78	0.075	-0.0162	-1.52	0.128
underemp	-0.0015	-1.01	0.311	-0.0015	-0.98	0.325	-0.0110	-1.17	0.240	-0.0117	-1.19	0.234
looking for other job	-0.0006	-0.02	0.980	-0.0048	-0.20	0.844	0.0489	0.31	0.756	0.0554	0.35	0.729
self-rated health	0.0565	3.85	0.000	0.0560	3.81	0.000	0.2800	3.09	0.002	0.2665	2.93	0.003
age	-0.0104	-0.93	0.351	-0.0119	-1.05	0.293	-0.1203	-1.62	0.106	-0.1313	-1.74	0.082
age ²	0.0002	1.45	0.148	0.0002	1.56	0.120	0.0016	2.20	0.028	0.0017	2.29	0.022
n of children	0.0145	0.63	0.531	0.0153	0.66	0.508	0.0614	0.38	0.704	0.0345	0.21	0.833
partner	0.3512	5.51	0.000	0.3519	5.52	0.000	1.7107	4.00	0.000	1.7534	4.06	0.000
constant	3.4275	9.76	0.000	3.4575	9.78	0.000						
rho	0.6391			0.6391								

Working hours, happiness and peers' labour supply

Another element likely to influence the relationship between weekly working time and well-being is the weekly working time of people in the social environment. Others' work hours can influence the value which an individual attributes to work, first through influencing the value of working time or free time itself (shared time being more valuable than time spent alone), and second in that it is the expression of social norms or beliefs about how much the members of a given group should work. The radically different relationship between working time and happiness observed for men and women suggests that social norms are at work here. One could imagine that men are the happier the more they work because they then fit in what is expected from them by their environment, and that working hours have less influence on women's well-being because of the big diversity in hours patterns among women in the Netherlands. If this is true, hours should matter less than the difference between own working time and the working time of one's acquaintances: one would expect that deviations from the working time of one's peers leads to a decrease in happiness. To test this hypothesis, we estimate the influence of the difference between an individual's working time and that of his or her peers (i.e. the absolute number of hours that an individual works more or less than his or her peers) on happiness, and then include it in the model estimating the effect of weekly working time on happiness. The estimation results are presented in table 4 and 5. In the following, we consider that men are primarily affected by the behaviour of other men in their acquaintances and women by other women. We have tested the possibility that women's (men's) working time influences the relationship between working time and happiness of men (women) in their environment. We found no significant effect on an individual's happiness of the working time of peers of the other gender.

Working more than other men in their acquaintances does not appear to lower the happiness level of men, but rather to increase it. Working less than men in their acquaintances has in itself a negative effect on men's happiness. Both results remain even when working time itself is included in the model. In the latter case, the terms for work hours above 33 lose their significance when the difference in hours with men's peers is introduced. This suggests that what matters to men's happiness is not the number of hours they work in itself, nor conformity with their peers' working hours, but working more, and not working less, than their peers. It is important to note that working more than one's peers is strongly positively correlated to working long hours (the pairwise correlation coefficient between working more than other men and the number of hours worked above 48 hours a week is 0.60). It is however not evident that our results are influenced by multicollinearity: the pairwise correlation between working more than one's peers and the other hours terms is smaller (the pairwise correlation with hours taken as a continuous variable is 0.49), the variance inflation factor for the hours terms above 33 are between 2 and 3 (below 5, which is often considered the threshold indicating that multicollinearity is disturbing the results), and the hours terms above 33 hours are not only

individually, but also jointly insignificant in the fixed-effects model (p-value of the F-test: 0.9360). Finally, even in the presence of a high correlation, the difference in labour supply with their peers seems to be a better predictor of men's happiness in the fixed-effects model than the number of hours they work. For women, working more than one's acquaintances appears to have a negative but insignificant effect on happiness. Working less than their peers has a negative and significant effect on the happiness of women. Taking up the difference between own and peers' weekly working time does not affect much the significance of the coefficients on the hour terms. It therefore looks like women feel better when not working less than others, but do not care about how much they work. In any case, this suggests that the relationship between working time and well-being is less sensitive to peers' working time for women than for men. Here again, we note that the results from the fixed-effects and FCF estimations are very similar in qualitative terms.

To check the results obtained here, we also estimated the effect of working time on happiness separately for the respondents who worked less than their peers, the same number of hours, or more. The estimation results are presented in table 10 in Annex 2. For men, we do no longer find a positive and significant effect of working time in any group. For men working less than their peers, working hours in medium part-time jobs have a negative effect on happiness. For men who work the same number of hours as their peers, we find that an increase in working time leads on average to a decrease in their happiness if they work in full-time jobs with overtime over very long hours. For men working more than their peers, we find no significant effect of working time on happiness. This seems to confirm the result that what matters for men's happiness level is not working long hours in itself, but working more hours than their peers. It is not clear, however, why men who work the same hours as their peers are less happy when working long hours, whereas this is not the case for men working more than their peers. For women, we find positive and significant effects of working time on happiness for women who work less than their peers and in medium part-time jobs, and for women who work the same number of hours as their peers in full-time jobs with overtime or very long hours. For women working more than their acquaintances, working time does not seem to matter to happiness. This suggests that women get happier by working more as long as they do not work more than their peers, at least in some cases. This would suggest that they value shared working time more than leisure spent alone.

Table 4 Estimation of the effect of working time on happiness for men, including the difference with peers' working time

	fixed effects			FCF			FCF					
n observations	8850			8850			3674			3674		
n individuals	3437			3437			799			799		
R ²	0.1109			0.1094			0.0511			0.0551		
log likelihood							-1350.617			-1344.8815		
	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value
log real income per person	0.0166	0.78	0.437	0.0169	0.79	0.428	0.2059	1.37	0.171	0.2018	1.33	0.182
work 1 to 16 hours				-0.0034	-0.85	0.394				-0.0035	-0.13	0.898
work 17 to 32 hours				-0.0037	-2.60	0.009				-0.0164	-1.67	0.094
work 33 to 40 hours				0.0003	0.29	0.771				0.0075	1.14	0.255
work 41 to 48 hours				0.0005	0.54	0.589				0.0087	1.37	0.171
work > 48 hours				0.0003	0.29	0.774				0.0060	0.96	0.339
overman	0.0032	2.94	0.003	0.0029	2.30	0.021	0.0212	2.78	0.005	0.0176	2.06	0.039
underman	-0.0018	-3.34	0.001	-0.0018	-2.44	0.015	-0.0152	-3.93	0.000	-0.0119	-2.36	0.018
looking for other job	-0.0618	-3.03	0.002	-0.0599	-2.94	0.003	-0.4953	-3.59	0.000	-0.4872	-3.50	0.000
self-rated health	0.0963	7.19	0.000	0.0960	7.16	0.000	0.5801	6.26	0.000	0.5836	6.27	0.000
age	-0.0021	-0.20	0.842	-0.0023	-0.21	0.832	-0.0019	-0.03	0.979	-0.0111	-0.15	0.882
age ²	0.0001	1.00	0.318	0.0001	1.03	0.304	0.0007	1.03	0.305	0.0009	1.23	0.219
n of children	-0.0404	-2.09	0.037	-0.0424	-2.19	0.028	-0.1855	-1.42	0.155	-0.2045	-1.56	0.119
partner	0.3509	7.06	0.000	0.3515	7.08	0.000	1.9251	5.15	0.000	1.9019	5.08	0.000
constant	3.0837	9.75	0.000	3.0712	9.68	0.000						
rho	0.6391			0.6403								

Table 5 Estimation of the effect of working time on happiness for women, including the difference with peers' working time

	Fixed effects			FCF			FCF					
n observations	7007			7007			2817			2817		
n individuals	2964			2964			664			664		
R ²	0.0741			0.0709			0.0174			0.0186		
log likelihood							-1044.4801			-1043.2523		
	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value
log real income per person	0.0342	1.32	0.188	0.0357	1.37	0.172	0.2425	1.38	0.167	0.2499	1.42	0.156
work 1 to 16 hours				0.0008	0.27	0.787				0.0025	0.11	0.909
work 17 to 32 hours				-0.0004	-0.26	0.792				-0.0044	-0.46	0.649
work 33 to 40 hours				-0.0012	-0.90	0.371				-0.0097	-1.14	0.256
work 41 to 48 hours				-0.0003	-0.25	0.804				-0.0033	-0.37	0.713
work > 48 hours				-0.0005	-0.35	0.730				-0.0087	-0.90	0.367
overvrouw	-0.0014	-1.16	0.247	-0.0010	-0.63	0.528	-0.0080	-1.01	0.313	-0.0036	-0.37	0.713
undervrouw	-0.0012	-1.66	0.097	-0.0013	-1.75	0.080	-0.0096	-1.98	0.047	-0.0112	-2.14	0.032
looking for other job	0.0050	0.21	0.836	0.0036	0.15	0.883	0.1075	0.67	0.505	0.1049	0.64	0.522
self-rated health	0.0486	3.19	0.001	0.0487	3.20	0.001	0.2074	2.18	0.029	0.2040	2.14	0.033
age	-0.0154	-1.31	0.192	-0.0147	-1.23	0.219	-0.1562	-1.96	0.050	-0.1470	-1.82	0.069
age ²	0.0002	1.68	0.093	0.0002	1.57	0.116	0.0019	2.39	0.017	0.0018	2.19	0.028
n of children	0.0240	1.00	0.319	0.0240	0.99	0.320	0.0595	0.35	0.727	0.0515	0.30	0.763
partner	0.3597	5.57	0.000	0.3597	5.57	0.000	1.6640	3.83	0.000	1.6904	3.87	0.000
constant	3.5055	9.70	0.000	3.4882	9.58	0.000						
rho	0.6466			0.6473								

The result that relative labour supply seems to matter more to men than relative hours raises the question whether the effect of the difference between a respondent's working time and his or her peers' does not rather capture an effect of relative income on well-being and on the relationship between working time and happiness. The DNB Household Surveys asks respondents about the income of their acquaintances in the following way: 'How much do you think is the average total net income per year of those households [households of your acquaintances]?'. They can indicate to which one of 11 income classes the average income of households of their acquaintances belongs, just as they could indicate before to which one of the same 11 income classes the total net income of their own households belongs. We get a measure of relative income by subtracting the former class indicator from the latter. Unfortunately, the number of respondents who answered both questions is limited, so that including relative income in our estimations considerably reduces the estimation sample (to 3394 observations for men and 1881 observations for women). The latter estimation sample also contains less non-workers and more individuals working long hours than the estimation sample for the basic model. This means that the comparability between the results using relative income and the results without is subject to caution.

The results are presented in table 11 and 12, in Annex 2. We observe that for men, introducing relative income in the basic model (i.e. without the difference between own and peers' working time) does not lead to estimation results substantially different from those presented in table 1. Working more still leads to a significant increase in men's happiness, even if it is less significant than in the basic model, and even working very long hours does so. Relative income does not itself have a significant effect on men's happiness. When relative income is introduced in the extended model (i.e. including the difference between own and peers' working time), the hour terms remain insignificant. The coefficients on the variable indicating the gap with peer's labour supply remain significant. This suggests that relative income cannot explain the whole of the positive effect on man's happiness of working more than their peers. An explanation for this result may be men feeling better when they conform to a social norm that men are expected to 'work hard'. Another possible explanation would be that jobs with longer hours are also associated with higher status, and that this higher status is not entirely captured by relative income. Unfortunately, the DNB Household Survey does not enable us to control for sector, occupation or other status-related job characteristics. For women, introducing relative income in the basic model leads to the coefficients on working long hours becoming positive and significant in some cases. Relative income itself appears to have a negative and significant effect on self-rated happiness of women, which is even found to be significant in the FCF estimations. This is a surprising result, as one would rather have expected a positive effect of relative income, and possibly a negative effect of hours if working more is used as a means to 'keep up with the Joneses'. We checked for multicollinearity between relative income and working time, but find no evidence of particularly high correlations. When relative income is introduced in the extended model, the gap

between women's labour supply and their peers' does no longer have a significant effect on women's happiness. Instead, working full-time with overtime hours (41 to 48 hours a week) appears to have a positive (weakly) significant effect on women's happiness. It seems like women dislike working less than their peers because of the effect thereof on relative income, and 'intrinsically' enjoy working long hours, once relative income is controlled for. However, we are reminded here that in the estimation sample including relative income, women working long hours are overrepresented compared to the estimation sample of the basic model. It is therefore unsure whether this result is also valid for the totality of the estimation sample we started with.

Conclusions

We estimated the effect of weekly working time on self-rated happiness of men and women based on the DNB Household Survey, a panel held among Dutch households since 1993. We find that working longer hours has a positive and significant effect on the happiness of men from 33 hours on and without bound. This might be explained by the specific characteristics of the group working very long hours. For women, we find that working time does not affect happiness for all women taken together, but we find some differences when looking at different education levels separately. We find no evidence that constraints on labour supply affect the relationship between working time and self-rated happiness: including the difference between desired and actual hours of the respondents in the model does not change the effect of working time on happiness much. We find some evidence that the difference between own working time and the working time of acquaintances of the same gender does matter. We find that men prefer to work more than their male peers, and that the number of hours they work does no longer matter once this effect is accounted for. We find evidence that relative labour supply has an effect of its own on men's well-being, going beyond the effect of relative income, which could be explained by supposing that it captures the effect of conforming to a social norm asking men to 'work hard', or some form of social status not captured by relative income. In any case, we find no evidence that men value having the same amount of free time as their peers. For women, we find some weak evidence that they prefer shared working time to leisure time spent alone. There is a possibility that this result is actually due to women not wanting to stay behind their peers in terms of income, but this result should be nuanced by the fact that the number of observations on relative income is small.

The policy implications of this conclusion are problematic. Looking at actual labour market participation, there seems to be more scope to increase the working time of women than of men. But women do not seem to want to work more. The findings suggest that men are rather willing to work more than women. This seems not to be due to an income effect, but rather to intrinsic motivation or the will to conform to their peers' behaviour. For women, these elements play a much smaller role, if at all. Increasing the working time of men, however, might be problematic for other reasons, such as

possible consequences for health, and could have adverse effects on women's labour force participation.

As far as the estimation method is concerned, the OLS with fixed-effects and the conditional logit with individual thresholds developed by Ferrer-i-Carbonell & Frijters (2004) do not in general give qualitatively different results, even if the magnitude of the estimated coefficients differs between both models. This is in line with the finding by Ferrer-i-Carbonell and Frijters (2004) that controlling for individual heterogeneity matters more for the estimation results than assumptions about the cardinality or ordinality of well-being. This suggests that treating self-rated happiness as a continuous variable does not disturb the results much.

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Annex 1 – Descriptive statistics

Table 6 Distribution of self-rated happiness in the estimation sample

	Men		Women	
	n	%	n	%
To what extent do you consider yourself a happy person?				
Very unhappy	23	0.24	9	0.12
Unhappy	118	1.23	54	0.71
Neither happy nor unhappy	1,336	13.96	1,051	13.77
Happy	6,341	66.28	5,011	65.67
Very happy	1,749	18.28	1,506	19.74
Total	9,567	100	7,631	100

Figure 1 Self-rated happiness by worked hours for men (average happiness by 4-hours groups)

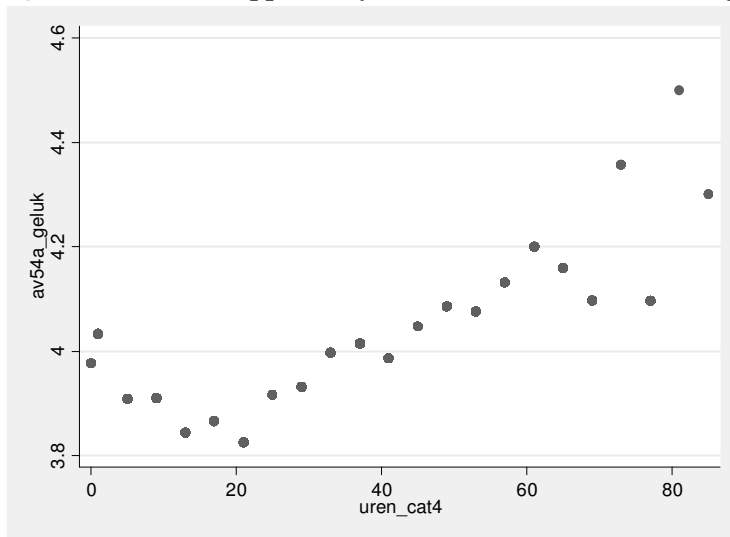


Figure 2 Self-rated happiness by worked hours for women (average happiness by 4-hours groups)

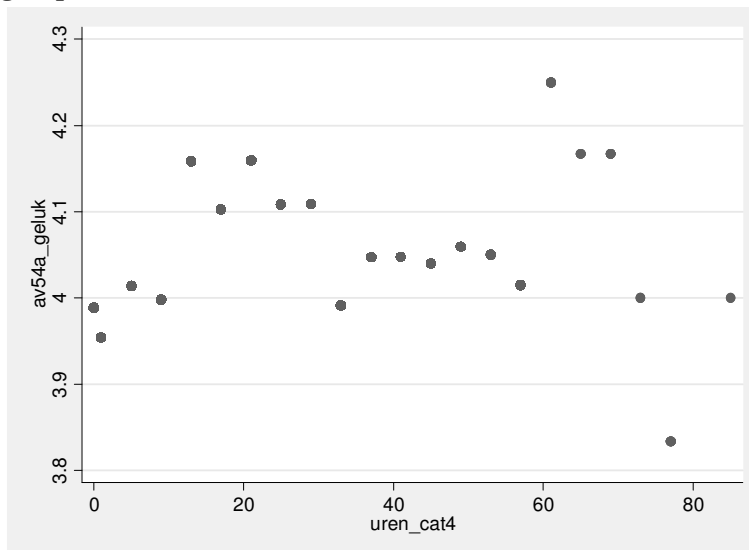
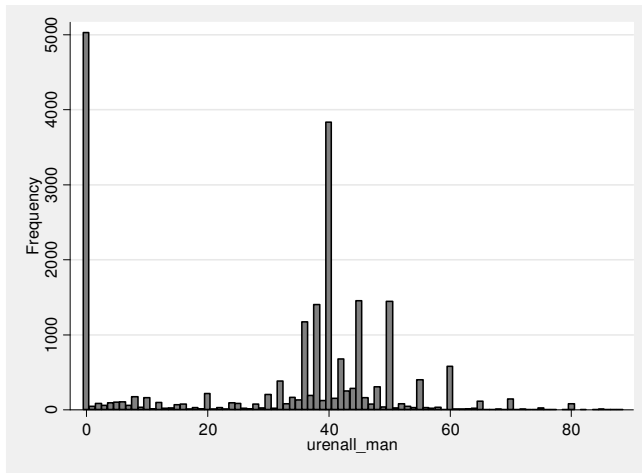
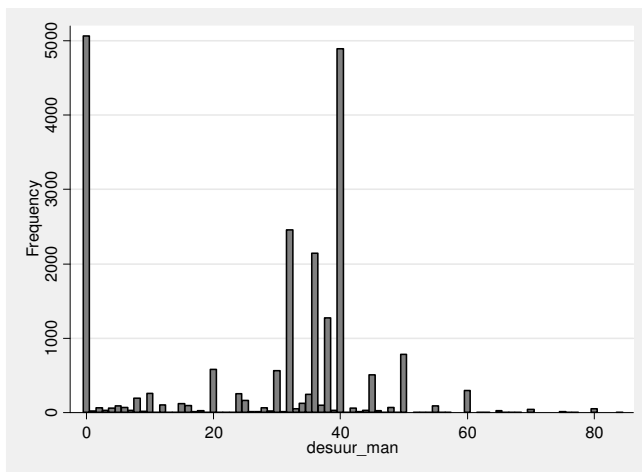


Figure 3 Distribution of own working hours, desired working hours and peers' working hours for men

actual hours



desired hours



peers' hours

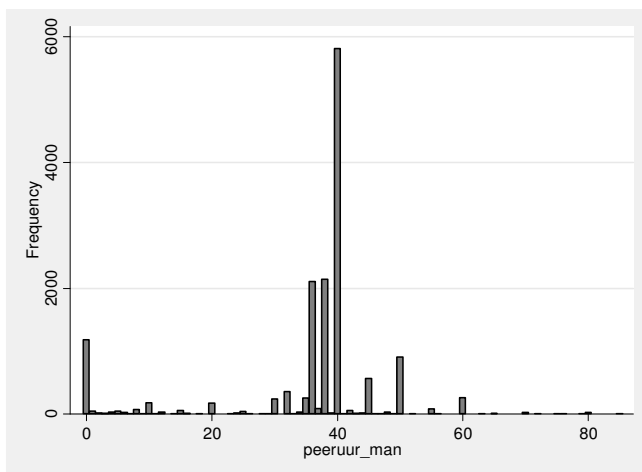
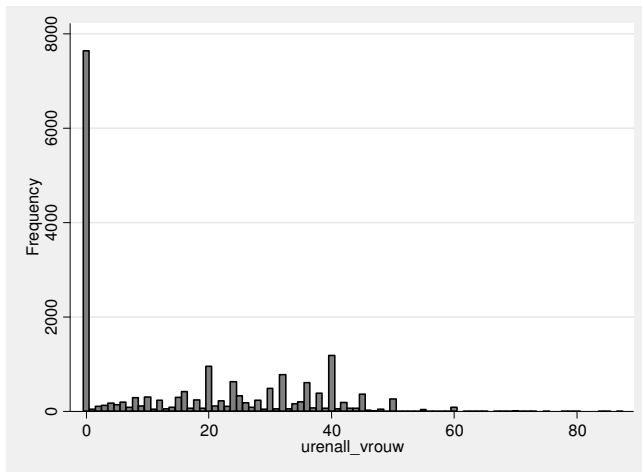
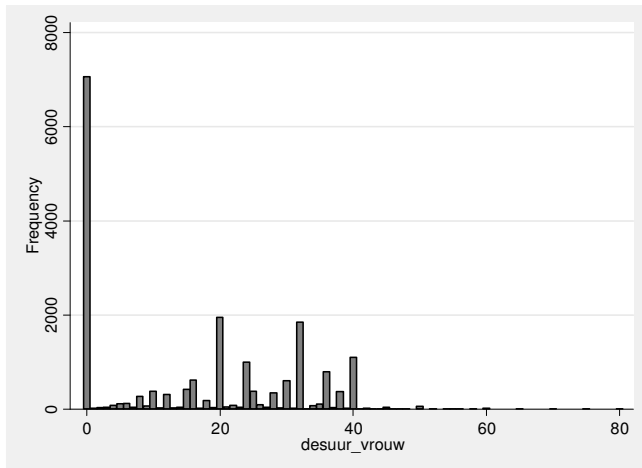


Figure 4 Distribution of own working hours, desired working hours and peers' working hours for women

actual hours



desired hours



peers' hours

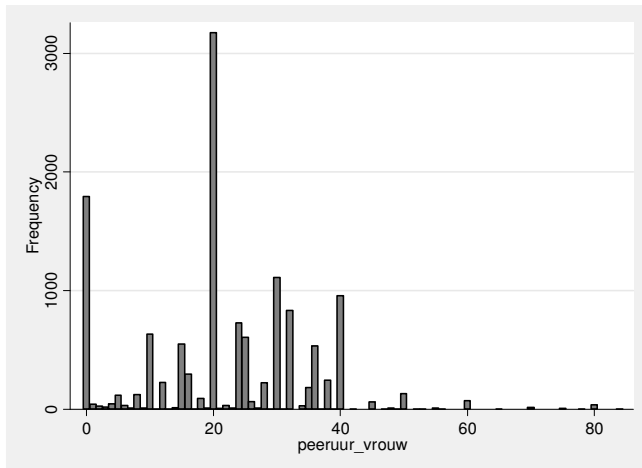


Table 7 Transition probabilities for the self-rated happiness variable in the estimation sample

happiness in t	Very unhappy	Unhappy	Neither happy nor unhappy	Happy	Very happy	Total
happiness in t+ 1						
Very unhappy	28.57	21.43	14.29	14.29	21.43	100
Unhappy	3.85	32.05	42.31	20.51	1.28	100
Neither happy nor unhappy	0.17	2.99	62.34	33.39	1.11	100
Happy	0.12	0.27	6.71	81.02	11.88	100
Very happy	0.06	0.12	0.87	37.63	61.31	100
Total	0.2	0.94	13.61	65.54	19.7	100

Annex 2 – Complementary estimation results

Table 8 Estimation of the effect of working time on happiness by age groups, fixed effects¹²

Men	15-25		25-35		35-45		45-55		55-65		> 65	
n observations	529		1181		2211		2376		2183		2192	
n individuals	346		704		1092		1076		840		704	
R ²	0.0189		0.1804		0.1332		0.0974		0.1233		0.1335	
log real income per person	-0.1466	0.453	0.0309	0.742	0.0236	0.702	-0.0120	0.791	0.0497	0.158	0.0251	0.477
work 1 to 16 hours	-0.0028	0.805	-0.0098	0.647	0.0807	0.004	-0.0102	0.380	-0.0095	0.107	-0.0001	0.992
work 17 to 32 hours	-0.0180	0.008	-0.0056	0.342	0.0068	0.174	0.0013	0.648	-0.0026	0.177	-0.0009	0.779
work 33 to 40 hours	-0.0008	0.872	-0.0014	0.669	0.0082	0.006	0.0049	0.005	0.0006	0.558	0.0064	0.034
work 41 to 48 hours	-0.0080	0.297	0.0012	0.676	0.0067	0.014	0.0056	0.001	0.0025	0.036	0.0036	0.299
work > 48 hours	0.0017	0.707	0.0007	0.769	0.0064	0.010	0.0041	0.005	0.0022	0.064	0.0022	0.224
looking for other job	0.0945	0.451	-0.0386	0.449	-0.0889	0.025	-0.0042	0.913	-0.0684	0.314	0.2956	0.230
self-rated health	0.1293	0.089	0.1317	0.004	0.0826	0.016	0.0573	0.033	0.0668	0.012	0.0696	0.001
age	0.0093	0.748	-0.0096	0.509	-0.0058	0.467	0.0179	0.002	0.0136	0.018	0.0102	0.001
n of children	0.0669	0.734	0.0643	0.341	-0.1136	0.049	-0.0001	0.999	-0.0527	0.228	0.0396	0.759
partner	(omitted)		0.3675	0.007	0.4924	0.000	0.0463	0.714	0.2847	0.051	0.4945	0.000
constant	4.4712	0.024	3.2416	0.001	3.1497	0.000	2.7528	0.000	2.2163	0.000	2.4300	0.000
rho	0.5652		0.6439		0.5946		0.6642		0.6795		0.6838	

¹² FCF-estimates could not be computed because of the too limited sample size.

Women	15-25		25-35		35-45		45-55		55-65		> 65	
n observations	484		1348		1821		1767		1560		1179	
n individuals	332		775		954		836		634		435	
R ²	0.012		0.0411		0.0851		0.0305		0.0805		0.0718	
log real income per person	0.0395	0.741	0.0754	0.381	0.0373	0.573	0.0431	0.410	0.0250	0.614	0.0686	0.293
work 1 to 16 hours	-0.0021	0.800	-0.0050	0.558	0.0027	0.682	0.0045	0.550	0.0054	0.420	0.0179	0.171
work 17 to 32 hours	-0.0054	0.301	-0.0034	0.330	0.0020	0.559	0.0040	0.203	-0.0021	0.416	-0.0076	0.189
work 33 to 40 hours	-0.0046	0.446	-0.0011	0.655	-0.0011	0.722	0.0019	0.505	-0.0031	0.155	-0.0008	0.840
work 41 to 48 hours	0.0031	0.529	0.0003	0.895	0.0012	0.683	0.0015	0.623	0.0000	0.993	-0.0137	0.097
work > 48 hours	0.0173	0.011	-0.0007	0.777	-0.0020	0.482	0.0006	0.818	-0.0002	0.962	-0.0124	0.200
looking for other job	-0.0369	0.705	0.0490	0.313	-0.0715	0.144	0.0808	0.102	-0.1960	0.031	-0.1500	0.617
self-rated health	0.0700	0.280	0.0703	0.110	0.0662	0.074	0.0162	0.591	0.0443	0.153	0.0713	0.047
age	0.0314	0.197	-0.0173	0.170	-0.0181	0.042	0.0215	0.004	0.0051	0.460	0.0024	0.678
n of children	0.2590	0.069	0.1730	0.012	0.0692	0.409	0.0310	0.511	-0.0785	0.258	-0.5385	0.251
partner	(omitted)		0.2022	0.089	0.3460	0.044	0.1181	0.586	0.3255	0.235	0.3479	0.003
constant	2.2812	0.100	3.3965	0.000	3.7634	0.000	2.3071	0.001	3.0250	0.000	2.6839	0.000
rho	0.7707		0.6443		0.6208		0.6702		0.6739		0.5988	

Table 9 Estimation of the effect of working time on happiness by education level, fixed effects¹³

Gender Education level	Men			Women								
	low	medium	high	low	medium	high						
n observations	2383	2717	3541	2724	2024	2068						
n individuals	1003	1116	1429	1189	970	868						
R ²	0.1359	0.1474	0.0648	0.0278	0.1038	0.0592						
	coeff.	p	coeff.	p	coeff.	p	coeff.	p	coeff.	p	coeff.	p
log real income per person	0.0179	0.714	0.0352	0.316	0.0098	0.782	-0.0050	0.915	0.0019	0.967	0.1170	0.013
work 1 to 16 hours	0.0063	0.380	0.0027	0.703	-0.0084	0.210	-0.0090	0.069	-0.0006	0.918	0.0106	0.089
work 17 to 32 hours	-0.0057	0.037	-0.0004	0.857	-0.0006	0.777	-0.0025	0.278	-0.0016	0.559	0.0026	0.242
work 33 to 40 hours	0.0016	0.270	0.0029	0.025	0.0023	0.069	-0.0004	0.832	-0.0040	0.101	0.0019	0.253
work 41 to 48 hours	0.0032	0.029	0.0032	0.015	0.0023	0.035	-0.0022	0.450	-0.0053	0.063	0.0027	0.103
work > 48 hours	0.0023	0.126	0.0037	0.002	0.0023	0.025	-0.0011	0.697	0.0028	0.260	0.0009	0.588
looking for other job	-0.0593	0.218	-0.0933	0.009	-0.0414	0.178	0.0113	0.832	-0.0139	0.770	-0.0305	0.396
self-rated health	0.0808	0.002	0.1312	0.000	0.0763	0.001	0.0222	0.367	0.0983	0.002	0.0085	0.744
age	-0.0137	0.582	-0.0096	0.631	-0.0071	0.707	0.0251	0.266	-0.0043	0.860	-0.0980	0.000
age ²	0.0002	0.495	0.0002	0.384	0.0002	0.196	-0.0001	0.481	0.0000	0.867	0.0010	0.000
n of children	0.0062	0.893	0.0488	0.195	-0.0832	0.005	-0.0617	0.134	0.0028	0.953	0.1972	0.000
partner	0.1435	0.406	0.3481	0.000	0.3852	0.000	0.6871	0.000	0.3621	0.012	0.3594	0.000
constant	3.5974	0.000	2.8119	0.000	3.0618	0.000	2.6538	0.000	3.4867	0.000	4.5783	0.000
rho	0.6403		0.6514		0.6611		0.6877		0.6533		0.6849	

¹³ FCF-estimates could not be computed because of the too limited sample size.

Table 10 Estimation of the effect of working time on happiness by individuals working less / equal / more than their peers, fixed effects¹⁴

	Men			Women								
	less	equal	more	less	equal	more						
n observations	3330	2118	3402	3408	1374	2225						
n individuals	1659	1272	1733	1753	884	1166						
R ²	0.1216	0.0056	0.0665	0.0659	0.0242	0.0462						
	coeff.	p-value	coeff.	p-value	coeff.	p-value	coeff.	p-value	coeff.	p-value	coeff.	p-value
log real income per person	-0.0278	0.452	0.0147	0.823	0.0144	0.706	0.0419	0.278	-0.1479	0.052	0.0260	0.631
work 1 to 16 hours	-0.0060	0.258	-0.0043	0.925	0.0201	0.197	0.0033	0.473	0.0008	0.968	-0.0038	0.746
work 17 to 32 hours	-0.0036	0.063	-0.0105	0.201	0.0043	0.505	0.0045	0.077	-0.0081	0.232	-0.0013	0.787
work 33 to 40 hours	-0.0004	0.814	-0.0032	0.263	0.0027	0.478	0.0006	0.858	-0.0044	0.511	-0.0021	0.584
work 41 to 48 hours	0.0030	0.126	-0.0085	0.038	0.0030	0.373	0.0009	0.930	0.0272	0.045	-0.0013	0.693
work > 48 hours	-0.0004	0.890	-0.0076	0.083	0.0026	0.348	(omitted)		0.0251	0.041	-0.0021	0.461
looking for other job	0.0381	0.453	-0.0601	0.268	-0.1220	0.000	0.1002	0.033	0.0669	0.521	-0.0759	0.050
self-rated health	0.1062	0.000	0.0891	0.009	0.0400	0.111	0.0441	0.078	0.0490	0.245	0.0268	0.370
age	-0.0056	0.800	0.0082	0.785	0.0113	0.613	0.0023	0.911	0.0821	0.073	-0.0279	0.280
age ²	0.0001	0.617	0.0001	0.857	0.0000	0.997	0.0000	0.990	-0.0006	0.099	0.0004	0.179
n of children	-0.0963	0.017	-0.0465	0.370	-0.0709	0.042	0.0032	0.928	-0.0068	0.927	0.0858	0.100
partner	0.3766	0.001	-0.0296	0.798	0.4456	0.000	0.1876	0.151	2.1833	0.000	0.2806	0.002
constant	3.5925	0.000	3.1882	0.001	2.8589	0.000	3.1794	0.000	1.1008	0.464	3.9669	0.000
rho	0.6430		0.7260		0.6831		0.6294		0.8849		0.6988	

¹⁴ FCF-estimates could not be computed because of the too limited sample size.

Table 11 Estimation of the effect of working hours on happiness including relative income for men

	fixed effects			FCF			FCF					
n observations	3394			3394			932			932		
n individuals	1844			1844			288			288		
R ²	0.098			0.096			0.0591			0.0699		
log likelihood							-322.86			-319.165		
	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value
log real income per person	-0.0341	-0.88	0.381	-0.0323	-0.83	0.405	-0.2087	-0.79	0.431	-0.1605	-0.60	0.548
relink	-0.0008	-0.09	0.928	-0.0034	-0.40	0.692	0.0050	0.08	0.934	-0.0165	-0.27	0.788
work 1 to 16 hours	-0.0018	-0.23	0.818	-0.0052	-0.66	0.512	-0.0536	-0.95	0.341	-0.0520	-0.92	0.358
work 17 to 32 hours	-0.0013	-0.46	0.644	-0.0045	-1.50	0.133	-0.0154	-0.75	0.455	-0.0379	-1.62	0.104
work 33 to 40 hours	0.0036	2.18	0.029	0.0005	0.23	0.814	0.0279	2.44	0.015	0.0071	0.46	0.644
work 41 to 48 hours	0.0030	2.00	0.046	-0.0003	-0.13	0.894	0.0245	2.38	0.017	0.0018	0.13	0.900
work > 48 hours	0.0028	2.00	0.046	-0.0006	-0.34	0.733	0.0171	1.73	0.083	-0.0082	-0.59	0.555
overman				0.0052	2.01	0.044				0.0415	1.99	0.046
underman				-0.0031	-1.96	0.050				-0.0243	-1.91	0.056
looking for other job	-0.0870	-2.49	0.013	-0.0890	-2.55	0.011	-0.6563	-2.75	0.006	-0.6840	-2.84	0.004
self-rated health	0.0615	2.51	0.012	0.0623	2.54	0.011	0.4612	2.45	0.014	0.4919	2.60	0.009
age	0.0014	0.06	0.954	0.0082	0.34	0.734	0.0046	0.03	0.978	0.0316	0.19	0.852
age ²	0.0000	0.21	0.832	0.0000	-0.14	0.886	0.0007	0.40	0.690	0.0003	0.15	0.884
n of children	-0.1010	-2.56	0.011	-0.1005	-2.54	0.011	-0.6273	-2.34	0.019	-0.6061	-2.23	0.026
partner	0.3748	3.72	0.000	0.3683	3.66	0.000	1.7246	2.07	0.038	1.7187	2.04	0.042
constant	3.6002	5.55	0.000	3.5756	5.51	0.000						
rho	0.6651			0.6667								

Table 12 Estimation of the effect of working hours on happiness including relative income for women

	fixed effects						FCF					
n observations	1881			1881			472			472		
n individuals	1167			1167			160			160		
R ²	0.0137			0.0099			0.0622			0.0671		
log likelihood							-161.049			-160.216		
	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value	coeff.	t	p-value
log real income per person	-0.0799	-1.28	0.202	-0.0795	-1.27	0.205	-0.9174	-1.86	0.063	-0.9250	-1.89	0.058
relink	-0.0017	-0.15	0.879	0.0000	0.00	0.998	0.0243	0.35	0.725	0.0597	0.82	0.414
work 1 to 16 hours	-0.0031	-0.44	0.659	-0.0001	-0.01	0.989	-0.0103	-0.24	0.813	0.0157	0.33	0.740
work 17 to 32 hours	-0.0043	-1.46	0.145	-0.0014	-0.39	0.700	-0.0264	-1.43	0.152	-0.0035	-0.15	0.880
work 33 to 40 hours	0.0010	0.40	0.692	0.0037	1.19	0.235	-0.0001	-0.01	0.995	0.0187	0.95	0.340
work 41 to 48 hours	0.0040	1.54	0.123	0.0065	2.06	0.040	0.0295	1.65	0.099	0.0507	2.24	0.025
work > 48 hours	0.0035	1.42	0.156	0.0060	1.87	0.062	0.0143	0.91	0.365	0.0336	1.61	0.108
overvrouw				-0.0024	-0.67	0.503				-0.0228	-0.93	0.352
undervrouw				0.0031	1.33	0.183				0.0197	1.35	0.179
looking for other job	0.0012	0.02	0.982	0.0073	0.14	0.888	-0.0116	-0.03	0.974	0.1162	0.33	0.744
self-rated health	0.0292	0.79	0.427	0.0274	0.75	0.455	0.2466	1.09	0.274	0.2154	0.95	0.343
age	-0.0078	-0.25	0.803	-0.0110	-0.35	0.728	0.0998	0.43	0.666	0.1058	0.46	0.648
age ²	0.0002	0.54	0.593	0.0002	0.69	0.492	0.0000	0.00	0.999	0.0002	0.07	0.947
n of children	-0.0465	-0.83	0.404	-0.0481	-0.86	0.390	-0.6993	-1.76	0.078	-0.6615	-1.68	0.093
partner	0.3693	2.67	0.008	0.3553	2.57	0.010	1.2825	1.36	0.173	1.1988	1.26	0.206
constant	4.4478	5.03	0.000	4.4258	5.00	0.000						
rho	0.6802			0.6830								