Does Retirement Change Life Style Habits? *

Hiroyuki Motegi †Yoshinori Nishimura ‡Kazuyuki Terada §

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Abstract

This paper studies the effect of retirement on life style habits, including drinking, smoking and exercise by using the Japanese Study of Aging and Retirement (JSTAR). Rich information in JSTAR enables us to use unique instrumental variables to account for endogeneity. Our contribution is showing new results that people reduce smoking and alcohol intake after retirement though frequency of excersice seems unchanged. Controlling important factors also allows us to inspect the detailed channels between retirement and life style habits. Our estimation suggests that peer effects in the work place is mainly influential to habits of drinking and smoking.

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Keywords: retirement, life style habits, smoking, drinking, exercise, Japanese elderly people, JSTAR, instrumental variable, mandatory retirement, fixed effect

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†Graduate School of Economics, the University of Tokyo, Japan. email: motegihiro@gmail.com
‡Graduate School of Economics, the University of Tokyo, Japan. email: nishimura.yy@gmail.com
§Graduate School of Economics, the University of Tokyo, Japan. email: trdkzyk@gmail.com

1 Introduction

1.1 Motivation

Nowadays, there are many discussions about reforms of social security system all over the world. Social security expenditure accounts for a large percentage of whole government expenditure, tightening national finance. Increasing life expectancy due to progress of medical technology allows people to work at higher ages. Many developed countries, facing the problem of a low birth rate and an aging population, have been trying to make use of labor force of elderly people, who are still able to work. For such reasons, the governments in developed countries must take policies to cut social welfare spending and raise worker's retirement age. For example, the Japanese government has raised the pensionable age from 60 to 65. The further postponement to 70 is under consideration. The Japanese government also put the elderly employment stabilization law into operation in 2006, which encourages firms to continue hiring older workers. These polices succeed in delaying the retirement of workers and cutting costs of social security.[1]

We, however, must give consideration to the consequences of health from retirement as well because the relationship between health and retirement has not yet examined enough. Whether or not the effect of retirement on health is beneficial or harmful should be taken account for the evaluation on retirement policy. If an increase in the pensionable age encouraged elderly people to work more but retirement worsens health, we would overestimate the impact of raising the pensionable age on social welfare since the evaluations of the retirement policy have so far ignored the impact on health and medical cost.[2] Inspecting the impact of retirement on health is required so as to more accurately evaluate the retirement policy.

To examine the relationship between retirement and health is an important question no only as a practical economic policy question but also as an econometric question estimating dynamic structural model about labor supply such as French (2005). French (2005) developed a dynamic life cycle model including asset accumulation and uncertainty about death shocks, subjective health shocks and wage shocks. He provides an empirical analysis of the effects of the social security system and liquidity constraints on life cycle labor supply. He finds that shifting the early retirement age has no effect on labor supply by counter factual simulation. There are many models including other factors based on French (2005) such as French and Johns (2011), which includes health insurance. Their model assumes that people decide to retire or not given exogenous subjective health shocks. As we mentioned before, there is possibility that retirement affect their health so that we must take the possibly endogenous relation between retirement and health into considerations when estimating a structural model.[3] Examining the existence of causality that retirement has an influence on health is a challenging question from the aspect of test of economic theory.

A number of studies have investigated the relationship between retirement and health over the last decades. Most of the studies apply unique identification strategies such as instrumental variables method, regression discontinuity or fixed effect method. There are, however, no unifying views about the impact of retirement on health. Some studies conclude that retirement has an positive impact on health defined as mental health or physical health, but other studies conclude that retirement has no or negative effect. Charles (2004), Coe and Zamarro (2011), Insler (2014), Johnston and Lee (2009) and Rohwedder and Willis (2010) are representative papers studying the

[1] See Shigeoka and Kondo (2014) and Krueger and Pischke (1992).

[2] Of course, there are other effects such as shifting the loss to younger workers.

[3] They assume exogeneity of health shocks for modeling and computational simplicity.

effect of retirement on health.

We also measure impact of retirement on health such as subjective health, mental health, BMI, grip strengthen, ADL and IADL through OLS and IV estimation by using JSTAR.[4] All variables can not get significant results. Why are there differences about views of the relationships between each papers. Some reasons can be considered. Health variables are very sensitive and may include measurement errors. Furthermore, especially JSTAR has only 3 periods panel data. It takes much time for health conditions to come out after retirement due to nature of it.

In addition to this, it is important to examine the channels how retirement has an influence on health to answer the different opinions. Examining mechanism and getting some consistent views about relationships between retirement and health is valuable. Retirement possibly affect health through two channels. Firstly, retirement changes people's daily life style and strengthens healthy behavior so that new habits have good influence on their health. People, for instance, exercise more after retirement for their health. Secondly, retirement itself recovers their health. This is because, for example, a relief from pressure due to workload would improve health after retirement. We would like to focus on first channel because it can have a room for improvement from the policy perspectives. Especially, drinking, smoking and exercise are considered main behaviors which may change after retirement and all of them have a remarkable impact on health, which is proved by medical literatures.[5] Analyzing the effect of relief from stress on daily habits life is also important as testing mechanism between them. This paper, therefore, investigates whether retirement changes people's behavior such as drinking, smoking and exercise or not and furthermore inspects these channels.

Very few research investigate the relationship between retirement and life style habits or health investment behavior. Insler (2014) finds that retirement increases exercise and decreases smoking by using fixed effect logit models. Insler (2014) can not control other factors and the result is not very robust, so that there is a room for improvement. Zhao et al (2014), which is independent of ours, estimate the effect of retirement on health investment behavior such as drinking, smoking and exercise by using Japanese panel data set which is different from ours. They use pension eligibility ages as instrumental variable to analyze the effect of complete retirement on health investment behavior. In addition, they also analyze the case of retirement from permanent employment by using regression discontinuity design. They regard 60 years old as the mandatory retirement age and assume that 60 is the age of retirement from permanent employment by confirming the data which shows that the proportion of permanent workers drops discontinuously around 60. They do not, however, restrict the sample to the people who smoke or drink before retirement so that the results may represent people who do not smoke or drink from the beginning. And some important factors like health status are not controlled.

Our contribution is finding new results. In addition to this, we inspect the channels in which retirement affect life style habits. There is no research about the relation between retirement and life style habits in Japan except Zhao et al (2014).

We analyze the latest longitudinal data set from the Japanese Study of Aging and Retirement (JSTAR), which includes valuable information about Japanese elderly people. We apply the instrumental variables method and fixed effect regression. JSTAR asks whether respondents have ever experienced mandatory retirement or not, and the variable is used as an instrumental variable. JSTAR says that Japanese people retire mainly due to whether they have ever experienced manda-

[4]IV is same as following analysis.

[5]See Hashibe et al (2007), Jemal et al (2008) and Broderick et al (2007).

tory retirement or not so that it is a good instrument. There are no main reasons to retire in other countries, for example, in England according to the English Longitudinal Study of Aging (ELSA). The results to be shown in the following section reveal that people decrease the amount of drinking and smoking, but do not change time for exercise. Furthermore, a peer effect in workplace is likely the main factor about changes of drinking and smoking.

The rest of this paper is arranged as follows. Section 2 explains the process of analysis more deeply. Section 3 explains our estimation methods and identification strategies. Section 4 describes the data. Section 5 shows instrumental validity and main results. Section 6 concludes this research and discusses future extensions.

2 Process of Analysis

We examine whether retirement from labor market changes people's life style habits such as drinking, smoking and exercise or not. Exercise is different from drinking and smoking in the way which retirement affect on such practices. This is because on the one hand exercise is regarded as health promoting behavior, but on the other hand smoking and drinking is regarded as health diminishing behavior. Tobacco and alcohol are also physical goods and exercise is not. In addition, people can get utility from consuming tobacco and alcohol, but can not get it from exercise itself.

We exclude the situations as follows. Some people change preference for daily practices after retirement, but preference is constant over time in economics as deep parameter. We follow this convention. In addition, change in prices of alcohol and tobacco alters consumption of them. But both alcoholic price and cigarettes price shows no changes in sample periods.[6] Furthermore, the sharp decrease of income after retirement may keep people from drinking and smoking, but this possibility can be rejected. This is because people can foresee the timing of retirement for mandatory retirement or pension eligibility age. Rational agents smooth consumption.

We raise two channels between retirement and drinking and smoking as hypotheses. Firstly, people drink and smoke for mental stress such as working pressure and owing to job relations while in labor market. After quitting jobs, people decrease or stop smoking for no need of it because of being released from job-related mental stress. Secondly, people drink and smoke for job communications, which is a kind of peer effect. They must sometimes drink and smoke because fellow workers do them. Drinking with bosses is part of tasks in some cases in the Japanese culture. This research focuses on these channels that is not identified perfectly by our data unfortunately. We construct the hypothesis that the amount of drinking and smoking is decreasing after retirement because of stress or peer effect.

About exercise, we can expect the other channel, that is, time allocation channel and retirement promotes exercise. We assume that people can only not exercise for time constraint while working. We can think that people just change time allocations between time for exercise and labor hours. They use redundant time resulting from job retirement on investing health. This hypothesis is not applicable about drinking and smoking because people spend less time on them from the beginning.

In addition, only exercise can be reinterpreted in a framework of Grossman (1972). He thought of health as capital stock variables. Health depreciates like capital stock and people invest in health, for example, by exercise and buying healthy good in each periods.[7] An opportunity cost of exercise,

[6]The tax of cigarettes has changed in 2010, but we do not use 3rd periods about smoking analysis due to a defect of data.

[7]Becker (2007), which extended Grossman (1972), interprets health stock as a survival probability.

that is the price of health investment, is high while working, but decreases after experiencing mandatory retirement in most cases. It depends on magnitude of substitution effect and income effect of changing of cost of exercise whether time for exercise increases or not. It is difficult for Grossman (1972) to explain the change of amount of drinking and smoking. This is because firstly we doubt the opportunity cost of drinking and smoking. Furthermore, people have no incentive to reduce drinking and smoking after retirement as long as they get utility from those habits. Drinking and smoking are possibly considered as disinvestment behavior in health stock, but we cannot come up with the appropriate model about drinking and smoking based on Grossman (1972). These have been discussed in the addiction models such as Becker et al (1994) in convention.

3 Estimation Method

This section presents the estimation methods. Firstly, we use ordinary least squares (OLS) as a base line model. We estimate an equation of the form:

$$y_i = \beta_0 + \beta_1 NWi + X_{1i}\delta_1 + \epsilon_{1i} \tag{1}$$

In the following model, i is individual, X_{1i} is a set of exogenous control variables that include gender, age[8], education level[9], marital status, the number of children, income, owning house, bad health, depression, instrumental activity of daily living (IADL), feeling pressure to work, physically demanded work, and four city dummies. Feeling pressure to work and physical labor variables catch the information about cause of drinking and smoking. Dependent variables y_i is about drinking, smoking and exercise. Drinking and smoking are binary variables representing 1 if people decrease them compared to last periods. Exercise is also binary variable representing 1 if people increase exercise compared to last periods. The binary and target variable NW_i is representing 1 if people do not work at all, which means that working hours is 0. JSTAR asks whether people are on leave of absence or not and almost all people answer that they are not seeking jobs and are not going to seek jobs. This means that almost all not working elderly people are retired. We restrict the sample to the people who smoke or drink before retirement, and identify the effect of retirement.

Error terms ϵ_{1i} seems to be correlated with NW_i in most cases. OLS can not estimate β_1 consistently in this case. We apply instrumental variables (IV) method to account for endogeneity in retirement. Retirement is endogenous because people may determine life style and working decision simultaneously by other reasons which is not captured by observed variables. We use the variables MR_i which represents whether people experienced mandatory retirement or not. Japanese companies set the around 60 as mandatory retirement age regardless of employers' will so that MR_i can be considered exogenous. JSTAR directly asked people whether they have ever experienced mandatory retirement or not. It is advantageous to other studies such as Zhao et al (2014) which setting 60 as mandatory retirement age equally. JSTAR says that Japanese people retire mainly due to whether they have ever experienced mandatory retirement or not so that it is a good instrument. The main reasons why people retire are mandatory retirement (38.89%), taking pension (2.88%) and taking care of family (2.06%) in JSTAR. The variables X_{2i} include the informations about

[8]Base of age is less than 54 years old.

[9]Base of education level is junior high school.

health conditions. Health conditions affect the decision of retirement so that controlling them is very important. The validity of IV as statistics is discussed in next section. In the end, We estimate an equation of the form:

$$y_i = \beta_0 + \beta_1 NW_i + X_{1i}\delta_1 + \epsilon_{1i} \tag{2}$$

$$NW_i = \alpha_0 + \alpha_1 MR_i + X_{2i}\delta_2 + \epsilon_{2i} \tag{3}$$

This paper interprets this parameter as local average treatment effect (LATE) in case of 2SLS. We discuss the assumptions that IV estimator can be regarded as LATE. Firstly, we check an exclusion restriction condition, that is, $y_i(NW, MR_i = 0) = y_i(NW, MR_i = 1)$. This means that IV does not affect potential outcomes directly. It is difficult to imagine for a fact of retirement itself to have an influence on health.[10] To confirm this assumption, we regress y_i on MR_i and X_{1i} by limiting people who work in previous period and do not work in this period. The results support our argument except smoking.[11] Secondly, we check first stage estimation assumption for confirming that IV can affect treatment variable, not working. First stage estimation results in Table 9, 10, 11 prove that the assumption is satisfied. Third and fourth assumption can not be checked by data. Thirdly, independence assumption, that is $(y_{1i}, y_{0i}, NW_i(MR_i = 1), NW_i(MR_i = 0))$ is independent of MR_i conditional on X_i, where y_{1i} is a potential habitual variable with retirement, and y_{0i} is without retirement. This assumption can be considered satisfied because employers set the age of mandatory retirement independently. The decision of retirement conditional on instrumental variable and control variables is independent of employers decision. Finally, a monotonicity assumption is discussed, which means $NW_i(MR_i = 1) \geq NW_i(MR_i = 0)$ almost surely. We can not assert this assumption is satisfied, but with high probability. This assumption is violated if the employment conditions is improved when experiencing mandatory retirement. Such people may be in high status because reconstruction after retirement sometimes improve working conditions with high salary. This research considers there are less people who violated this assumption. IV estimator can be interpreted as LATE if all 4 conditions are satisfied. In this research, LATE estimates average treatment effect for those who decide retirement by experience of mandatory retirement allowing for heterogeneous treatment effect. We, therefore, estimate $E(y_{1i} - y_{0i}|NW_i(MR_i = 1) \neq NW_i(MR_i = 0))$ in mathematical formula.

Finally, we use fixed effect models in order to control individual's fixed effect like preferences. In this case, the unit of dependent variables changes a little compared to OLS and IV. Smoking in fixed effect regression means how many cigarette people consume per day. Drinking also means how much people consume alcohol per day. Estimated equation is as follows:

$$y_{it} = \beta_0 + \beta_1 NW_{it} + X_{1it}\delta_1 + \theta_i + \eta_t + \epsilon_{1it} \tag{4}$$

4 Data

This paper uses the Japanese Study of Aging and Retirement (JSTAR) to analyze the effect of retirement on life style habits. JSTAR is a panel survey of elderly people aged 50 or older like that

[10] Very few people may make up their mind to change life style by regarding mandatory retirement as good opportunity.

[11] Smoking is 10% significant. But it is very small sample.

in other countries such as Chinese Health and Retirement Longitudinal Study (CHARLS) in China, English Longitudinal Survey on Ageing (ELSA) in the United Kingdom, the Health and Retirement Study (HRS) in the United States, Korean Longitudinal Study of Aging (KLoSA) in South Korea, Longitudinal Aging Study in India (LASI) in India and Survey on Health, Aging, and Retirement in Europe (SHARE) in continental Europe. The observation span is 2007, 2009 and 2011, which amounts to 3 periods. The number of observations is about 4291 in 1st periods. JSTAR include a rich variety of variables to capture living aspects in terms of economic status, health status, family background, as well as social and work status.

The reason why we use JSTAR is that the rich informations in JSTAR make us use unique IV and control health conditions. Especially health conditions are interviewed in detail in JSTAR and the information is very important in this analysis. In addition to this, the other unique questionnaire is essential for accurate analysis, for example, the way defining retirement. Table 1 shows summary statistics. We mainly use the Harmonized JSTAR data set.[12] When variables which we want to use are not available in the Harmonized JSTAR, we use the original variables in JSTAR.

Table 1: Summary Statistics (JSTAR)

	2007			2009			2011		
Variable	Mean	(s.d.)	N	Mean	(s.d.)	N	Mean	(s.d.)	N
Cigarettes smoked	4.483	(9.598)	3940	3.766	(8.738)	4069	3.766	(8.738)	4069
Alchohol intake	13.437	(24.931)	3773	1.979	(23.428)	4134	11.979	(23.428)	4134
Frequency of heavy exercise	-	-	0	0.127	(0.333)	2796	0.127	(0.333)	2796
Not working for pay	0.434	(0.496)	4148	0.494	(0.5)	4558	0.494	(0.5)	4558
Male	0.48	(0.5)	7913	0.48	(0.5)	7913	0.48	(0.5)	7913
Education (high school)	0.575	(0.494)	7870	0.575	(0.494)	7870	0.575	(0.494)	7870
Education (college)	0.161	(0.367)	7870	0.161	(0.367)	7870	0.161	(0.367)	7870
Married	0.814	(0.389)	4152	0.789	(0.408)	4554	0.789	(0.408)	4554
Number of children	2.054	(0.974)	4157	2.104	(1.129)	4575	2.104	(1.129)	4575
Logged income	14.894	(2.086)	3972	14.647	(2.394)	4347	14.647	(2.394)	4347
Own house	0.887	(0.394)	4036	0.848	(0.435)	4360	0.848	(0.435)	4360
Bad Health Dummy	0.188	(0.391)	4145	0.176	(0.381)	4571	0.176	(0.381)	4571
Depression Dummy	0.14	(0.347)	4120	0.146	(0.353)	4149	0.146	(0.353)	4149
Any IADL Difficulity	0.088	(0.283)	4036	0.085	(0.279)	4202	0.085	(0.279)	4202
Stress at work	0.229	(0.42)	4128	0.175	(0.38)	4514	0.175	(0.38)	4514
Physical labor	0.251	(0.434)	4133	0.222	(0.416)	4521	0.222	(0.416)	4521

We summarize the descriptive statistics. In Table 2, we summarize the transition pattern of smoking behavior. In Table 2, we can observe that the ratio of the transition pattern 'Yes → No' is larger in the group who have the transition 'Work → Not Work' in both cases (1st → 2nd, 2nd → 3rd). In Table 3, the change of smoking amount decreases more in the group who have the transition 'Work → Not Work'. It is possible that the effect of 'Work → Not Work' might make workers stop or decrease smoking behavior. This evidence might support the two hypothesis that stress in a workplace makes people smoke or colleagues in a workplace influence workers' working behavior. However, it is possible that people stop or decrease smoking behavior because people become older. In Table 4, we observe that people are not likely to smoke after they become older. We have to control the effect of age in regression analysis.

[12]The program code to generate the Harmonized JSTAR dataset from the original JSTAR dataset is provided by the Center for Global Aging Research, USC Davis School of Gerontology and the Center for Economic and Social Research (CESR).

Table 2: The Transition Pattern of Smoking Behavior

1st → 2nd (Work → Work)	Smokes at $t+1$ (Obs)	Does not smoke at $t+1$ (Obs)
Smokes at t	87%(317)	13% (47)
Does not smoke at t	2%(21)	98% (935)
1st → 2nd (Work → Not Work)	Smokes at $t+1$ (Obs)	Does not smoke at $t+1$ (Obs)
Smokes at t	85% (56)	15% (10)
Does not smoke at t	3% (5)	97% (161)
2nd → 3rd (Work → Work)	Smokes at $t+1$ (Obs)	Does not smoke at $t+1$ (Obs)
Smokes at t	79% (286)	21% (77)
Does not smoke at t	1% (14)	99% (991)
2nd → 3rd (Work → Not Work)	Smokes at $t+1$ (Obs)	Does not smoke at $t+1$ (Obs)
Smokes at t	69% (31)	31% (14)
Does not smoke at t	2% (3)	98% (180)

Table 3: The Change of Smoking Amount

Change in working status (observations)	Change in the number of cigarettes smoked per day
Work → Work (1293)	-0.7
Work → Not Work (230)	-1.2

Table 4: The Smoking Rate at 2007

	Female		Male	
Age	Yes (Obs)	No (Obs)	Yes (Obs)	No (Obs)
60-64	12% (47)	88% (358)	39% (154)	61% (240)
65-71	6% (37)	94% (564)	28% (164)	72% (424)
72-78	4% (12)	96% (257)	21% (50)	79% (192)

In Table 5, the fact that people are not likely to drink after they stop working is observed (-4.66 and -0.98). This is the same tendency in smoking behavior. However, as in Table 6, average drinking amount decreases when people become older. We can not identify retirement effect and age effect in these Tables and we also have to control the effect of age in regression analysis as to drinking behavior. In Table 7 and 8, we show the transition of sport habit. "Increase" in Table 7 and 8 means that a respondent increased the frequency of exercise from 2nd wave to 3rd wave. We can observe that there is not large difference between the transition "Work → Not Work" and the transition "Work → Work" in both heavy exercise and light exercise cases. We must consider this situation more deeply by econometric analysis.

5 Results

This section reports the main results of estimation about three health behaviors: smoking, drinking, and exercise. The models are estimated via instrumental variables method and fixed effects regression, respectively.

Table 5: The Change of Average Amount of Alcohol

gram	1st → 2nd	2nd → 3rd
Work → Work	0.92	-0.48
Work → Not Work	-4.66	-0.98
Obs	1st → 2nd	2nd → 3rd
Work → Work	1292	1383
Work → Not Work	223	238

Table 6: The Average Amount of Alcohol Intake in 2007

Age	Female (Obs)	Male (Obs)
60-64	3.87g (383)	25.11g (372)
65-71	2.24g (584)	20.10g (559)
72-78	1.46g (255)	15.80g (226)

Table 7: The Change of Heavy Exercise from 2009 to 2011

Change in Working Status	Increase (Obs)	Not Increase (Obs)
Work → Work	4% (7)	96% (164)
Work → Not Work	5% (56)	95% (1048)

Table 8: The Change of Light Exercise from 2009 to 2011

Change in Working Status	Increase (Obs)	Not Increase (Obs)
Work → Work	17% (30)	83% (143)
Work → Not Work	15% (163)	85% (937)

5.1 Instrumental Variables Method

Table 9, Table 10, and Table 11, show the results of three models, ordinary least squares (OLS), two stage least squares (2SLS), and instrumental variables probit (IVP). To begin with, our IV, mandatory retirement, has a positively significant coefficient at 5% in the first stage regression (2SLS 1st and IVP 1st) of each table, which implies who have ever experienced mandatory retirement are likely to be in the status of retirement. Besides, it is tested that the variable mandatory retirement has no significance direct effect on the health behaviors.[13] This fact supports the assumption that mandatory retirement is a valid IV. As mentioned above, controlling the endogeneity would provide with a better estimates in the presence of the endogeneity in working decision. In addition, the dependent variables are binominal (whether a respondent has improved her health behavior or not over time), and thus, probit model would have a even better fitness.

Regarding to the result about smoking behavior presented in Table 9, working status has a statistically significant coefficient at 5% in the IVP. That is, a transition in working status from working to not working is positively correlated with reduction in the number of cigarettes smoked. While at the same time, it seems that working environment, described by the variables stress at work and physical labor, does not affect the change in the smoking behavior. This means that we can reject the hypothesis that stress from jobs makes people to smoke. In the first stage regressions of 2SLS and IVP, bad health dummy and depression dummy are significantly positive; that is, less healthy workers tend to retire earlier. It seems that health takes an important role in retirement decision.

As in Table 10, drinking behavior seems to have a similar correlation with working status. Who quit job are likely to reduce the amount of alcohol to drink regardless of the stress at work or physical labor while either stress at work or physical labor is not significantly influential on drinking habit. The variable of gender is also statistically significant. The reason is presumably that men, on average, drink alcohol much more than women do and there is more room to reduce the amount of alcohol. Age category dummies are also positively correlated with reduction in the alcohol. It seems intuitive that people reduces the alcohol with age. College dummy also has positive coefficients, suggesting that people with higher education are more likely to care their health. Besides, the health dummies are significantly correlated with retirement decision as the first stage regression shows.

In contrast to smoking and drinking, the estimates about heavy excursive, displayed in Table 11, does not show any interesting correlation with the explanatory variables. Only male, logged income, and city dummy 1 shows statistically significant estimates. In the context of health investment, one can expect the frequency of excursive would increase after retirement because of relaxed time constraint, but, the estimates reject such a prediction. It seems that individual heterogeneity that are not controlled here is important. For instance, people who habitually play a sport with their colleges may stop the habit after retirement. Retirement, on the other hand, would not affect the exercise habit of people who regularly do exercise with someone out of their workplace. The coefficient of male dummy implies that men are more likely to increase the frequency of excursive than women. There also is a trend that wealthy people excursive more after retirement. The reason would be that doing sports or exercise requires some costs, such as cost of buying sporting goods and cost of using gym facilities. This result is consistent with the model of Grossman (1972) that the individuals with higher income invest more in their health.

[13] Only in the 1st stage of smoking regression, the statistical significance was 10%, but the number of observations is small.

Table 9: JSTAR Smoking Behavior

Whether number of cigarretes smoked decreased	OLS	2SLS 2nd	2SLS 1st	IVP 2nd	IVP 1st
Not working for pay	0.133	0.778		1.769	
	(0.078)*	(0.553)		(0.890)**	
Male	0.003	0.049	-0.084	0.109	-0.084
	(0.076)	(0.094)	(0.054)	(0.205)	(0.053)
Age 54-59	0.092	0.095	-0.008	0.233	-0.008
	(0.104)	(0.114)	(0.066)	(0.286)	(0.064)
Age 60-64	0.171	0.123	0.027	0.300	0.027
	(0.107)	(0.128)	(0.076)	(0.337)	(0.073)
Age 65-71	0.109	0.011	0.088	0.043	0.088
	(0.113)	(0.152)	(0.083)	(0.370)	(0.081)
Age 72-28	0.227	0.081	0.187	0.201	0.187
	(0.145)	(0.196)	(0.115)	(0.486)	(0.112)*
Education (high school)	0.030	0.015	0.017	0.034	0.017
	(0.065)	(0.071)	(0.048)	(0.167)	(0.047)
Education (college)	0.181	0.155	0.032	0.351	0.032
	(0.087)**	(0.092)*	(0.056)	(0.239)	(0.055)
Married	-0.129	-0.173	0.061	-0.397	0.061
	(0.081)	(0.093)*	(0.058)	(0.198)**	(0.056)
Number of children	0.011	0.037	-0.037	0.084	-0.037
	(0.029)	(0.038)	(0.019)*	(0.079)	(0.018)**
Logged income	0.000	0.022	-0.036	0.050	-0.036
	(0.015)	(0.024)	(0.009)***	(0.047)	(0.008)***
Own house	0.016	0.061	-0.076	0.137	-0.076
	(0.076)	(0.087)	(0.052)	(0.180)	(0.050)
Bad Health Dummy	0.118	0.020	0.143	0.041	0.143
	(0.097)	(0.135)	(0.076)*	(0.310)	(0.074)*
Depression Dummy	-0.088	-0.175	0.129	-0.400	0.129
	(0.086)	(0.116)	(0.066)*	(0.231)*	(0.064)**
Any IADL Difficulity	-0.008	-0.129	0.185	-0.283	0.185
	(0.108)	(0.174)	(0.094)*	(0.352)	(0.092)**
Stress at work $(t-1)$	-0.016	-0.001	-0.025	-0.001	-0.025
	(0.057)	(0.063)	(0.040)	(0.147)	(0.039)
Physical labor $(t-1)$	-0.056	-0.053	0.006	-0.126	0.006
	(0.057)	(0.062)	(0.041)	(0.148)	(0.040)
City dummy 1	-0.043	-0.011	-0.044	-0.032	-0.044
	(0.081)	(0.087)	(0.055)	(0.204)	(0.054)
City dummy 2	-0.029	-0.054	0.058	-0.125	0.058
	(0.097)	(0.105)	(0.069)	(0.237)	(0.067)
City dummy 3	-0.065	-0.111	0.076	-0.254	0.076
	(0.090)	(0.103)	(0.064)	(0.223)	(0.062)
City dummy 4	-0.011	0.028	-0.048	0.063	-0.048
	(0.086)	(0.089)	(0.058)	(0.202)	(0.056)
Mandatory retirement			0.138		0.138
			(0.061)**		(0.059)**
N	354	354	354	354	354

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Robust standard errors are in parenthesis.

Table 10: JSTAR Drinking Behavior

Whether quantity of alchohol intake decreased	OLS	2SLS 2nd	2SLS 1st	IVP 2nd	IVP 1st
Not working for pay	0.049	0.561		1.403	
	(0.037)	(0.302)*		(0.577)**	
Male	0.115	0.115	-0.020	0.291	-0.020
	(0.028)***	(0.029)***	(0.021)	(0.081)***	(0.021)
Age 54-59	-0.023	-0.034	0.015	-0.077	0.015
	(0.057)	(0.060)	(0.026)	(0.142)	(0.026)
Age 60-64	-0.103	-0.156	0.060	-0.385	0.060
	(0.058)*	(0.067)**	(0.030)**	(0.149)***	(0.030)**
Age 65-71	-0.068	-0.152	0.116	-0.376	0.116
	(0.060)	(0.077)**	(0.034)***	(0.168)**	(0.034)***
Age 72-28	-0.049	-0.143	0.145	-0.355	0.145
	(0.068)	(0.091)	(0.045)***	(0.200)*	(0.045)***
Education (high school)	0.026	0.027	-0.012	0.067	-0.012
	(0.033)	(0.036)	(0.025)	(0.089)	(0.025)
Education (college)	0.101	0.099	-0.006	0.234	-0.006
	(0.048)**	(0.049)**	(0.031)	(0.120)*	(0.031)
Married	-0.031	-0.038	0.010	-0.093	0.010
	(0.037)	(0.039)	(0.029)	(0.099)	(0.029)
Number of children	0.011	0.010	0.003	0.026	0.003
	(0.015)	(0.015)	(0.011)	(0.038)	(0.011)
Logged income	0.002	0.018	-0.032	0.044	-0.032
	(0.008)	(0.013)	(0.007)***	(0.029)	(0.007)***
Own house	0.038	0.061	-0.046	0.154	-0.046
	(0.039)	(0.042)	(0.027)*	(0.100)	(0.027)*
Bad Health Dummy	0.022	-0.052	0.147	-0.136	0.147
	(0.044)	(0.066)	(0.039)***	(0.152)	(0.039)***
Depression Dummy	0.010	-0.006	0.031	-0.016	0.031
	(0.040)	(0.042)	(0.030)	(0.102)	(0.029)
Any IADL Difficulity	-0.005	-0.023	0.040	-0.060	0.040
	(0.059)	(0.065)	(0.050)	(0.157)	(0.050)
Stress at work $(t-1)$	-0.026	-0.018	-0.011	-0.041	-0.011
	(0.028)	(0.030)	(0.020)	(0.075)	(0.020)
Physical labor $(t-1)$	0.042	0.040	0.006	0.097	0.006
	(0.028)	(0.029)	(0.021)	(0.073)	(0.021)
City dummy 1	-0.007	-0.004	-0.003	-0.013	-0.003
	(0.041)	(0.042)	(0.028)	(0.105)	(0.027)
City dummy 2	0.002	-0.030	0.071	-0.076	0.071
	(0.048)	(0.054)	(0.037)*	(0.130)	(0.037)*
City dummy 3	-0.013	-0.024	0.029	-0.065	0.029
	(0.045)	(0.047)	(0.031)	(0.116)	(0.030)
City dummy 4	0.061	0.084	-0.036	0.207	-0.036
	(0.043)	(0.048)*	(0.029)	(0.112)*	(0.028)
Mandatory retirement			0.124		0.124
			(0.029)***		(0.029)***
N	1,373	1,373	1,373	1,373	

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Robust standard errors are in parenthesis.

Table 11: JSTAR Exercise

Whether frequency of heavy excersice increased	OLS	2SLS 2nd	2SLS 1st	IVP 2nd	IVP 1st
Not working for pay	-0.015	-0.069		-0.358	
	(0.029)	(0.046)		(0.276)	
Male	0.056	0.056	-0.048	0.299	-0.048
	(0.022)**	(0.022)**	(0.018)***	(0.127)**	(0.018)***
Age 54-59	-0.010	-0.019	-0.098	-0.013	-0.098
	(0.083)	(0.082)	(0.108)	(0.529)	(0.106)
Age 60-64	-0.013	-0.021	-0.160	-0.042	-0.160
	(0.081)	(0.080)	(0.108)	(0.524)	(0.107)
Age 65-71	0.027	0.024	-0.085	0.183	-0.085
	(0.082)	(0.081)	(0.108)	(0.522)	(0.107)
Age 72-28	-0.029	-0.026	-0.014	-0.116	-0.014
	(0.081)	(0.080)	(0.109)	(0.534)	(0.108)
Education (high school)	0.039	0.040	-0.006	0.222	-0.006
	(0.025)	(0.025)	(0.023)	(0.149)	(0.023)
Education (college)	0.050	0.050	-0.015	0.238	-0.015
	(0.039)	(0.039)	(0.030)	(0.194)	(0.029)
Married	-0.003	-0.004	0.001	-0.025	0.001
	(0.027)	(0.027)	(0.023)	(0.166)	(0.023)
Number of children	-0.004	-0.004	0.002	-0.024	0.002
	(0.011)	(0.011)	(0.009)	(0.059)	(0.009)
Logged income	0.008	0.007	-0.017	0.078	-0.017
	(0.003)***	(0.003)***	(0.006)***	(0.043)*	(0.006)***
Own house	0.026	0.029	0.010	0.162	0.010
	(0.022)	(0.022)	(0.025)	(0.118)	(0.025)
Bad Health Dummy	-0.058	-0.054	0.059	-0.386	0.059
	(0.025)**	(0.025)**	(0.036)	(0.239)	(0.036)*
Depression Dummy	-0.002	-0.001	0.024	0.004	0.024
	(0.030)	(0.030)	(0.029)	(0.178)	(0.029)
Any IADL Difficulity	-0.059	-0.059	-0.010	-0.381	-0.010
	(0.037)	(0.037)	(0.048)	(0.290)	(0.048)
Stress at work $(t-1)$	-0.015	-0.017	-0.012	-0.092	-0.012
	(0.024)	(0.024)	(0.017)	(0.125)	(0.017)
Physical labor $(t-1)$	0.008	0.007	-0.011	0.053	-0.011
	(0.022)	(0.022)	(0.019)	(0.116)	(0.018)
City dummy 1	-0.082	-0.082	-0.011	-0.396	-0.011
	(0.034)**	(0.034)**	(0.026)	(0.169)**	(0.026)
City dummy 2	-0.048	-0.048	0.026	-0.190	0.026
	(0.041)	(0.040)	(0.029)	(0.185)	(0.029)
City dummy 3	-0.053	-0.055	-0.044	-0.250	-0.044
	(0.037)	(0.036)	(0.029)	(0.173)	(0.029)
City dummy 4	-0.039	-0.042	-0.017	-0.169	-0.017
	(0.038)	(0.038)	(0.027)	(0.170)	(0.027)
Mandatory retirement			0.543		0.543
			(0.035)***		(0.034)***
N	969	966	966	966	966

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Robust standard errors are in parenthesis.

Table 12: JSTAR Fixed Effect

Variables	Smoke	Drink	Walk	Light Exercise	Heavy Exercise
Not working for pay	-0.345	-1.773	0.019	0.014	0.009
	(0.337)	(0.780)**	(0.023)	(0.040)	(0.026)
Age	-0.306	-0.103	-0.013	-0.016	0.003
	(0.049)***	(0.088)	(0.003)***	(0.005)***	(0.003)
Married	0.149	2.026	0.002	0.145	0.077
	(1.105)	(2.264)	(0.067)	(0.128)	(0.083)
Number of children	-0.505	0.673	0.017	0.002	-0.061
	(2.577)	(1.976)	(0.055)	(0.142)	(0.092)
Logged income	0.068	0.073	0.005	0.007	-0.002
	(0.039)*	(0.097)	(0.003)*	(0.005)	(0.003)
Bad Health Dummy	-0.570	-0.947	-0.019	-0.033	0.000
	(0.259)**	(0.613)	(0.018)	(0.030)	(0.019)
Depression Dummy	0.138	-0.811	-0.052	-0.040	-0.004
	(0.281)	(0.666)	(0.019)***	(0.031)	(0.020)
Any IADL Difficulity	-0.788	0.832	-0.007	-0.006	-0.010
	(0.402)*	(0.960)	(0.028)	(0.046)	(0.030)
Stress at work	0.016	-0.831	0.029	-0.043	-0.029
	(0.258)	(0.646)	(0.019)	(0.033)	(0.021)
Physical labor	-0.064	0.139	0.060	0.005	0.029
	(0.297)	(0.715)	(0.021)***	(0.035)	(0.022)
N	8,577	11,349	11,671	5,431	5,422

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Robust standard errors are in parenthesis.

5.2 Fixed Effect Regression

The result of FE regression is reported in Table 12. The dependent variables here are the number of cigarettes smoked, the amount of alcohol intake, and the frequency of exercise including walking, light exercise, and heavy exercise. The signs of working status's coefficient tell us that quitting job may encourage healthy habits although only the sign on drink is statistically significant. Smoking has a large standard error since the number of people who have smoking habit is small relative to nonsmokers. Exercise is not significant here as well as in the IV result, which suggests that the reallocation of time after retirement does not affect the frequency of exercise. Smoking, walking, and light exercise are likely to decline with age. It is interesting that bad health dummy, derived by self reported health status, is negatively correlated with smoking. A mutual interaction between bad health and smoking is considerable; people who habitually smokes a large number of cigarettes would ruin their health, and people who have bad health may try to reduce smoking for better health. This kind of interaction needs to be investigated in future research. Besides, depression dummy has a negative correlation with walking. Exploring the relationship between mental health and physical activity is a intriguing topic although it is not done in this paper. Walking also correlates with the dummy that respondent's job involves physical labor. This would be because walking in work time is counted in the reported walking time.

5.3 Robustness

We run additional IV regressions with different sets of explanatory variables. Table 13, Table 14 and Table 15 report the estimation on smoking habit, drinking habit, and exercise respectively. The signs and statical significance of them do not show a considerable difference from the previous ones. In addition, we also checked if types of job or industry may affect the relationship between retirement and health. It is confirmed, as a result, that either including job variable and industry

variable does not generate a remarkable change our estimation. Our result seems robust.

6 Conclusion

This research investigates the effect of retirement on life style habits including drinking, smoking and exercise. JSTAR has information about whether people have ever experienced mandatory retirement or not, and it is used as IV to deal with endoneneity. In Japan, the variable about mandatory retirement satisfies the condition for valid IV as explained. We construct the hypotheses that the release from mental stress or the lost of peer effects after retirement reduces smoking habit and drinking habit. In addition to this, the time reallocation due to retirement directs people to more exercise. The wide variety of questions of the JSTAR survey allows us to control many possible factors so as to successfully investigate the channels. The main results reveal that the retirement decrease drinking and smoking, which is consistent for our hypotheses, but the retirement does not have a significant influence on the frequency of exercise. Peer effects in the work place is mainly influential to habits of drinking and smoking. It is interesting to examine the impact of retirement on other life style habits, foe example, nutrition and medical care, which is remained as future researches.

There are two limitations of this work. This paper does not propose unifying economic models that can explain the decision making process about the life style habits: drinking, smoking and exercise. Especially, we could not provide the model, which explain the discontinuous change of drinking and smoking after retirement based on Grossman (1972). This is because people have no incentive to reduce drinking and smoking after retirement as long as they get utility from those habits. There are other competing models for describing behaviors of drinking and smoking with Grossman (1972) such as the addiction model proposed by Becker et al (1994). In addition to this, knowledge from behavioral economics may be taken advantage of. We are examining a variety of models closely while taking the characteristics of the goods into considerations.

The original purpose of this paper is to analyze the impact of retirement on health including mental health and physical health (BMI, grip strength, ADL and IADL). We regress health index on retirement variable and control variables by OLS, and furthermore use experience of mandatory retirement as IV to account for same endogeneity as our main research. The results, however, are not significant. Some speculations about these results are implied. Firstly, measurement error can be an issue when working with health indexes. Secondly, it possibly takes much time for health to show an observable change, although JSTAR has so far collected only three waves. Further waves of the survey will unravel the questions that this paper currently cannot answer.

A Tables of Supplemental Estimation

Table 13: JSTAR Smoking Behavior (Different Specifications)

Variables	IVP 2nd	IVP 1st	IVP 2nd	IVP 1st	IVP 2nd	IVP 1st	IVP 2nd	IVP 1st
Not working for pay	1.769		2.077		1.860		1.905	
	(0.890)**		(0.743)***		(0.765)**		(0.801)**	
Male	0.109	-0.084	0.194	-0.097	0.088	-0.069	0.100	-0.085
	(0.205)	(0.053)	(0.199)	(0.056)*	(0.203)	(0.056)	(0.206)	(0.053)
Age 54-59	0.233	-0.008	0.228	-0.022	0.293	-0.033	0.221	-0.008
	(0.286)	(0.064)	(0.242)	(0.059)	(0.266)	(0.062)	(0.281)	(0.064)
Age 60-64	0.300	0.027	0.212	0.038	0.352	0.002	0.280	0.029
	(0.337)	(0.073)	(0.301)	(0.065)	(0.303)	(0.068)	(0.333)	(0.072)
Age 65-71	0.043	0.088	-0.072	0.119	0.088	0.074	0.022	0.086
	(0.370)	(0.081)	(0.338)	(0.076)	(0.340)	(0.078)	(0.358)	(0.080)
Age 72-28	0.201	0.187	-0.107	0.298	0.188	0.195	0.158	0.193
	(0.486)	(0.112)*	(0.546)	(0.108)***	(0.463)	(0.109)*	(0.477)	(0.111)*
Education (high school)	0.034	0.017	0.142	-0.042	0.043	-0.003	0.029	0.016
	(0.167)	(0.047)	(0.144)	(0.046)	(0.154)	(0.047)	(0.164)	(0.046)
Education (college)	0.351	0.032	0.397	-0.033	0.373	0.012	0.330	0.030
	(0.239)	(0.055)	(0.205)*	(0.055)	(0.220)*	(0.054)	(0.233)	(0.054)
Married	-0.397	0.061	-0.192	-0.052	-0.364	0.043	-0.399	0.055
	(0.198)**	(0.056)	(0.218)	(0.059)	(0.193)*	(0.057)	(0.196)**	(0.057)
Number of children	0.084	-0.037	0.074	-0.038	0.052	-0.030	0.083	-0.035
	(0.079)	(0.018)**	(0.072)	(0.019)**	(0.072)	(0.018)*	(0.074)	(0.018)*
Logged income	0.050	-0.036			0.066	-0.045	0.056	-0.036
	(0.047)	(0.008)***			(0.051)	(0.009)***	(0.045)	(0.008)***
Own house	0.137	-0.076			0.168	-0.094	0.165	-0.070
	(0.180)	(0.050)			(0.178)	(0.052)*	(0.168)	(0.050)
Bad Health Dummy	0.041	0.143					0.001	0.142
	(0.310)	(0.074)*					(0.294)	(0.073)*
Depression Dummy	-0.400	0.129					-0.406	0.127
	(0.231)*	(0.064)**					(0.227)*	(0.064)**
Any IADL Difficulity	-0.283	0.185					-0.314	0.189
	(0.352)	(0.092)**					(0.343)	(0.090)**
Stress at work $(t-1)$	-0.001	-0.025						
	(0.147)	(0.039)						
Physical labor $(t-1)$	-0.126	0.006						
	(0.148)	(0.040)						
Mandatory retirement		0.138		0.114		0.147		0.140
		(0.059)**		(0.059)*		(0.059)**		(0.059)**
N	354		395		369		358	

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Robust standard errors are in parenthesis. City dummies are not displayed.

Table 14: JSTAR Drinking Behavior (Different Specifications)

Variables	IVP 2nd	IVP 1st	IVP 2nd	IVP 1st	IVP 2nd	IVP 1st	IVP 2nd	IVP 1st
Not working for pay	0.248		0.221		0.224		0.233	
	(0.178)		(0.162)		(0.175)		(0.176)	
Male	0.402	-0.051	0.412	-0.053	0.392	-0.049	0.403	-0.051
	(0.056)***	(0.014)***	(0.052)***	(0.013)***	(0.055)***	(0.013)***	(0.056)***	(0.014)***
Age 54-59	-0.052	-0.011	-0.017	-0.006	-0.022	-0.019	-0.055	-0.010
	(0.132)	(0.025)	(0.123)	(0.023)	(0.130)	(0.025)	(0.132)	(0.025)
Age 60-64	-0.182	-0.041	-0.115	-0.038	-0.126	-0.050	-0.172	-0.040
	(0.134)	(0.027)	(0.124)	(0.025)	(0.132)	(0.027)*	(0.133)	(0.027)
Age 65-71	-0.168	0.026	-0.124	0.030	-0.130	0.017	-0.154	0.028
	(0.138)	(0.028)	(0.128)	(0.026)	(0.135)	(0.029)	(0.137)	(0.028)
Age 72-28	-0.195	0.112	-0.171	0.121	-0.146	0.107	-0.184	0.118
	(0.152)	(0.034)***	(0.142)	(0.031)***	(0.149)	(0.034)***	(0.152)	(0.034)***
Education (high school)	0.060	-0.015	0.071	-0.026	0.074	-0.012	0.076	-0.014
	(0.066)	(0.017)	(0.061)	(0.016)	(0.064)	(0.016)	(0.065)	(0.017)
Education (college)	0.095	-0.014	0.142	-0.043	0.144	-0.021	0.114	-0.018
	(0.089)	(0.021)	(0.081)*	(0.019)**	(0.086)*	(0.020)	(0.087)	(0.020)
Married	-0.088	0.002	-0.055	-0.026	-0.077	0.003	-0.083	0.002
	(0.073)	(0.018)	(0.067)	(0.017)	(0.071)	(0.018)	(0.072)	(0.018)
Number of children	0.051	0.004	0.024	0.003	0.038	0.006	0.049	0.005
	(0.027)*	(0.007)	(0.025)	(0.006)	(0.027)	(0.006)	(0.027)*	(0.007)
Logged income	0.004	-0.029			0.006	-0.030	0.002	-0.029
	(0.016)	(0.005)***			(0.016)	(0.005)***	(0.016)	(0.005)***
Own house	0.065	-0.013			0.042	-0.014	0.062	-0.012
	(0.070)	(0.016)			(0.068)	(0.015)	(0.069)	(0.016)
Bad Health Dummy	0.089	0.093					0.076	0.091
	(0.088)	(0.025)***					(0.087)	(0.024)***
Depression Dummy	-0.005	0.023					-0.016	0.023
	(0.078)	(0.019)					(0.077)	(0.019)
Any IADL Difficulity	-0.227	0.037					-0.243	0.041
	(0.118)*	(0.034)					(0.117)**	(0.033)
Stress at work $(t-1)$	-0.025	-0.015						
	(0.056)	(0.013)						
Physical labor $(t-1)$	0.026	0.003						
	(0.054)	(0.013)						
2nd wave dummy	0.025	0.020	-0.010	0.012	0.013	0.012	0.014	0.018
	(0.055)	(0.013)	(0.051)	(0.013)	(0.053)	(0.013)	(0.054)	(0.013)
Mandatory retirement		0.361		0.368		0.360		0.364
		(0.021)***		(0.020)***		(0.021)***		(0.021)***
N	2,714		3,115		2,834		2,754	

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Robust standard errors are in parenthesis. City dummies are not displayed.

Table 15: JSTAR Exercise (Different Specifications)

Variables	IVP 2nd	IVP 1st	IVP 2nd	IVP 1st	IVP 2nd	IVP 1st	IVP 2nd	IVP 1st
Not working for pay	-0.358		-0.281		-0.282		-0.268	
	(0.276)		(0.243)		(0.263)		(0.264)	
Male	0.299	-0.048	0.308	-0.051	0.307	-0.049	0.329	-0.050
	(0.127)**	(0.018)***	(0.117)***	(0.017)***	(0.125)**	(0.018)***	(0.126)***	(0.018)***
Age 54-59	-0.013	-0.098	0.156	-0.099	0.089	-0.129	-0.001	-0.101
	(0.529)	(0.106)	(0.509)	(0.088)	(0.518)	(0.099)	(0.532)	(0.106)
Age 60-64	-0.042	-0.160	0.156	-0.165	0.079	-0.194	-0.035	-0.160
	(0.524)	(0.107)	(0.508)	(0.088)*	(0.516)	(0.099)**	(0.529)	(0.106)
Age 65-71	0.183	-0.085	0.278	-0.102	0.286	-0.120	0.188	-0.088
	(0.522)	(0.107)	(0.508)	(0.089)	(0.513)	(0.100)	(0.527)	(0.106)
Age 72-28	-0.116	-0.014	0.067	-0.023	-0.013	-0.042	-0.085	-0.007
	(0.534)	(0.108)	(0.518)	(0.090)	(0.522)	(0.101)	(0.539)	(0.107)
Education (high school)	0.222	-0.006	0.230	-0.012	0.236	-0.002	0.217	-0.005
	(0.149)	(0.023)	(0.138)*	(0.022)	(0.144)	(0.023)	(0.145)	(0.023)
Education (college)	0.238	-0.015	0.347	-0.031	0.250	-0.015	0.216	-0.015
	(0.194)	(0.029)	(0.171)**	(0.027)	(0.181)	(0.029)	(0.184)	(0.028)
Married	-0.025	0.001	0.110	-0.018	0.032	-0.004	0.021	0.000
	(0.166)	(0.023)	(0.157)	(0.022)	(0.165)	(0.023)	(0.166)	(0.023)
Number of children	-0.024	0.002	-0.023	0.005	-0.041	0.006	-0.036	0.004
	(0.059)	(0.009)	(0.055)	(0.008)	(0.060)	(0.009)	(0.059)	(0.009)
Logged income	0.078	-0.017			0.057	-0.017	0.055	-0.017
	(0.043)*	(0.006)***			(0.038)	(0.006)***	(0.035)	(0.006)***
Own house	0.162	0.010			0.168	0.013	0.167	0.012
	(0.118)	(0.025)			(0.119)	(0.024)	(0.117)	(0.024)
Bad Health Dummy	-0.386	0.059					-0.342	0.056
	(0.239)	(0.036)*					(0.218)	(0.035)
Depression Dummy	0.004	0.024					0.019	0.022
	(0.178)	(0.029)					(0.171)	(0.028)
Any IADL Difficulity	-0.381	-0.010					-0.409	-0.006
	(0.290)	(0.048)					(0.294)	(0.048)
Stress at work $(t-1)$	-0.092	-0.012						
	(0.125)	(0.017)						
Physical labor $(t-1)$	0.053	-0.011						
	(0.116)	(0.018)						
Mandatory retirement		0.543		0.557		0.545		0.546
		(0.034)***		(0.032)***		(0.034)***		(0.034)***
N	966		1,106		989		983	

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Robust standard errors are in parenthesis. City dummies are not displayed.

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