RIETI-JER Workshop

# Economics of Aging in Japan and other Societies

## Presentation


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# Does Retirement Change Life Style Habits?

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# 1. Introduction

## Motivation

Motivation for economic policy

(A common issue to developed countries)
Declining birth rate and aging population pushes up

- social security expenditure
- medical expenditure

Policies trying to cut social welfare spending and raise worker's retirement age:

- a rise in pensionable age
- abolishment of mandatory retirement
- reduction in social security benefit
- the elderly employment stabilization law

# 1. Introduction

## Motivation (continued)

Motivation for economic policy

We must evaluate economic policy more accurately.

- need to consider effects of retirement on health (good or bad?)
- e.g. What can we expect from a rise in pensionable age?
  - reduction in pension benefit payment
  - increase in labor supply of the elderly $\rightarrow$ affects health

$\rightarrow$ taking acount of the medical-cost change requried

# 1. Introduction

## Motivation (continued)

Motivation for economic literature

Health in many dynamic structural life cycle models:

- exogenous health shocks such as French (2005)
  - decision of retirement given exogenous subjective health shocks

Health really exogenous?

$\rightarrow$ Need to test!

# 1. Introduction

## Motivation (continued)

Investigating the effect of retirement on health is very important.

A number of studies investigating the effect of retirement on health

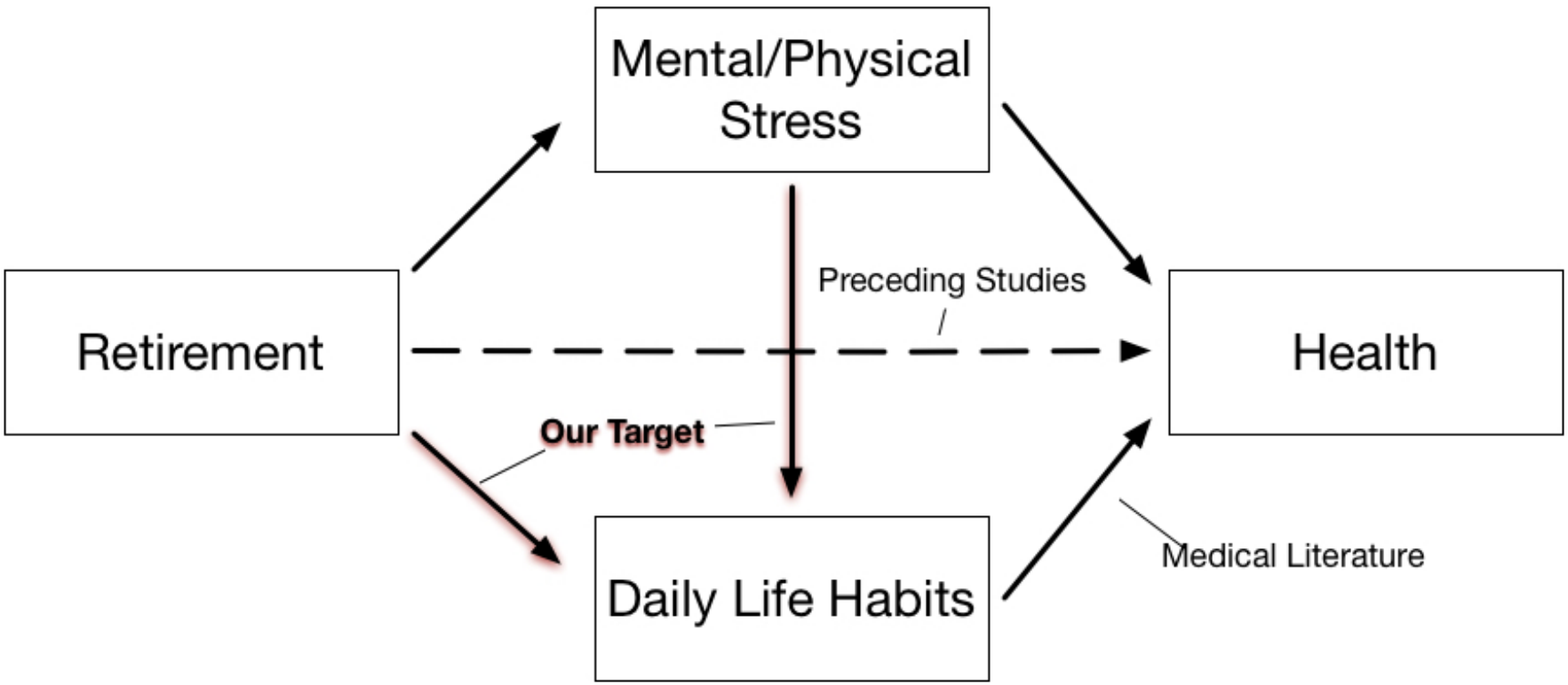
- Charles (2004) , Coe and Zamarro (2011), Johnston and Lee (2009), Rohwedder and Willis (2010) and Insler (2014)
- applying unique identification strategy

However, no unifying view about the relationship.

We can not discover the significant effect of retirement on health through IV by using JSTAR.
$\rightarrow$ important to check more detailed channels

# 1. Introduction

## Detailed Channels between Retirement and Health



# 1. Introduction

Retirement affect health through 2 channels.

1. changing people's daily life
2. retirement itself; a relief from pressure due to workload

We focus on 1.

Medical literatures confirm that there is causality between daily habits and health.

Research Question

- Does retirement change life style habits?
  focusing on smoking, drinking and exercise
- How does retirement change life style habits?
  Does stress from working affect life style habits?

Summary of Results

- reducing smoking and alcohol after retirement.
- no effect on exercise
- Peer effect in work places may be influential to smoking and drinking

Contribution

- practically first paper to investigate the effect of retirement on life style habits (especially in economic literature)
- new results by using unique instrumental variables in JSTAR
- inspecting the channels by rich information in JSTAR

# 3. Process of Analysis

We do not base specific economic model.

We assume that

1. the preference is constant over time
2. the price of tobacco and alcohol is constant over sample periods.
3. no effect of sharp income decreases after retirement (consumption smoothing)

# 3. Process of Analysis

Why do people possibly change life style after retirement?

We can consider 2 channels

1. mental stress such as working pressure
2. peer effects

We can consider another channels for exercise

3. changing time allocation

# 4. Estimation Method

## Ordinary Least Squares

OLS as base line model

$$y_i = \beta_0 + \beta_1 NWi + X_{1i}\delta_1 + \epsilon_{1i} \quad (1)$$

- $y_i$ ; taking 1 if decreasing smoking (drinking) (0 otherwise)
- $y_i$ ; taking 1 if increasing exercise (0 otherwise)
- $NW_i$ ; taking 1 if not working (0 otherwise)
  JSTAR confirms that almost all not working elderly people are retired.
- $X_{1i}$ ; controlled variables

However, not estimating $\beta_1$ consistently due to endogeneity

# 4. Estimation Method

## Instrumental Variable

We apply IV method

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

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

- $MR_i$ ; "Whether have ever experienced mandatory retirement or not" is binary IV.
- $X_{2i}$ ; controlled variables including health status such as subjective health, depression and IADL
- sample is restriced to the people who smoke (drink) before retirement

# 4. Estimation Method

## Validity of IV

### Validity of IV

- JSTAR asks people directly "Whether have ever experienced mandatory retirement or not"
- Mandatory retirement does not depend on individual decision. ($E(MR_i \epsilon_{2i}) = 0$)
- JSTAR confirms that Japanese people retire mainly due to mandatory retirement. (not weak instruments)
- Robustness checked by controlling types of job, industry and firm size
- Exclusion restriction satisfied

# 4. Estimation Method

## panel data

We apply fixed effect method.

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

- The unit of $y_i$ is changed.
- the number of cigarret
- gram of alcohol
- more or less for exercise ; binary

# 5. Data

## Basic Information

The Japanese Study of Aging and Retirement (JSTAR)

- data about Japanese elderly people over age 50
- panel data
- 3 periods (2007, 2009 and 2011)
- 4291 observations in 1st periods
- rich information about economic status, health status and family status

# 5. Data

## Intuition by Data

- People who retire may reduce smoking.

the change of smoking amount (1st $\rightarrow$ 2nd)

| status (observations) | Average change in # of cigarettes smoked |
|---|---|
| *work* $\rightarrow$ *work (1293)* | -0.7 |
| *work* $\rightarrow$ *not work (230)* | -1.2 |

# 5. Data

## Intuition by Data

the change of average alcohol intake (1st $\rightarrow$ 2nd)

| status (observations) | gram |
|---|---|
| *work* $\rightarrow$ *work (1292)* | 0.92 |
| *work* $\rightarrow$ *not work (223)* | -4.66 |

the change of average alcohol intake (2nd $\rightarrow$ 3rd)

| status (observations) | gram |
|---|---|
| *work* $\rightarrow$ *work (1383)* | -0.48 |
| *work* $\rightarrow$ *not work (238)* | -0.98 |

- People seem to reduce drinking after retirement.

# 5. Data

## Intuition by Data

Table: 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) |

- alcohol intake decreases over age
- retirement correlates with age
- econometric analysis to identify the effect of retirement on lifestyle habits

# 6. Results

## Main Results (OLS and IV)

Main Results (OLS and IV)

- 1st stage estimation is OK.
- smoking decreasing after retirement
- drinking decreasing after retirement
- The amount of exercise has not changed.

| | N | OLS | 2SLS | IVP |
|---|---|---|---|---|
| *smoking* | 354 | 0.133*(0.078) | 0.778(0.553) | 1.769**(0.89) |
| *drinking* | 1373 | 0.049(0.037) | 0.561*(0.302) | 1.403**(0.577) |
| *exercise* | 969 | -0.015(0.029) | -0.069(0.046) | -0.358(0.276) |

# 6. Results

## Main Results (IVP on drinking)

| Drinking | IVP 2nd | | IVP 1st | |
|---|---|---|---|---|
| Not working for pay | 1.403 | (0.577)** | | |
| Mandatory retirement | | | 0.124 | (0.029)*** |
| Male | 0.291 | (0.081)*** | -0.020 | (0.021) |
| Age 54-59 | -0.077 | (0.142) | 0.015 | (0.026) |
| Age 60-64 | -0.385 | (0.149)*** | 0.060 | (0.030)** |
| Age 65-71 | -0.376 | (0.168)** | 0.116 | (0.034)*** |
| Age 72-78 | -0.355 | (0.200)* | 0.145 | (0.045)*** |
| Education (high school) | 0.067 | (0.089) | -0.012 | (0.025) |
| Education (college) | 0.234 | (0.120)* | -0.006 | (0.031) |
| Married | -0.093 | (0.099)* | 0.010 | (0.029) |
| No. of children | 0.026 | (0.038) | 0.003 | (0.011) |
| Logged income | 0.044 | (0.029) | -0.032 | (0.007)*** |
| Bad health dummy | -0.136 | (0.152) | 0.147 | (0.039)*** |
| Depression dummy | -0.016 | (0.102) | 0.031 | (0.029) |
| IADL difficulty | -0.060 | (0.157) | 0.040 | (0.050) |
| Mental stress $(t-1)$ | -0.041 | (0.075) | -0.011 | (0.020) |
| Physical stress $(t-1)$ | 0.097 | (0.073) | 0.006 | (0.021) |

*Note*: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Robust s.e. are in parenthesis.

# 6. Results

## Main Results (FE)

Main Results (fixed effect)

| | N | FE |
|---|---|---|
| *smoking* | 8577 | -0.345 (0.377) |
| *drinking* | 11349 | -1.773** (0.780) |
| *walk* | 11671 | 0.019 (0.023) |
| *light exercise* | 5431 | 0.014 (0.040) |
| *heavy exercise* | 5422 | 0.009 (0.026) |

- These results are intuitive.
- Only drinking is significant.

# 6. Results

## Remarks

- All results are robust if adding type of jobs, industry and firm size
- Controlling health status is important
- Peer effect may be an important factor for life style habits.

# 6. Results

## Discussion

Comparing results in the United States

Insler (2014) also analyzed the impact of retirement on smoking and exercise by fixed effect logit model by using HRS.

| | smoking | drinking | exercise |
|---|---|---|---|
| *Insler(2014) by HRS* | decrease | *** | increase |
| *MNT(2014) by JSTAR* | decrease | decrease | no change |

- emphasizes the importance to analyze the channels

# 7. Conclusion

## Summary

Research Questions

- Does retirement change life style habits?
- How does retirement change life style habits?

Answers

- Smoking and alcohol decrease after retirement.
- No effect on exercise.
- Peer effects in work places may be influential to smoking and drinking.