OXFORD

Research Report

Patterns of work and retirement in a pension system with a flexible old-age retirement age: a register study of Finnish employees and self-employed persons born in 1949

Anu Polvinen [ID], Aart-Jan Riekhoff [ID], Satu Nivalainen, Susan Kuivalainen

Finnish Centre for Pensions, FI-00065 Eläketurvakeskus, Helsinki, Finland
Corresponding author: Finnish Centre for Pensions, FI-00065 Eläketurvakeskus, Helsinki, Finland. Email: anu.polvinen@etk.fi

Decision Editor: Kène Henkens

Abstract

The aims of this study were to explore patterns of work and retirement of Finnish employees and self-employed persons in a pension system with a flexible old-age retirement age and how income develops in these patterns. We used individual-level register data from Statistics Finland of the total Finnish birth cohort born in 1949. The cohort was 62–70 years old over the study period 2011–2019. Sequence and cluster analyses were used to identify typical trajectories of individuals' transitions in and out of salaried work and self-employment and work in old-age retirement. Our analysis yielded a ten-cluster solution: four clusters were found for employees who did not continue working in retirement (62%), four clusters for those employees who continued working in retirement (26%), and two clusters for the self-employed (12%). The clusters differed by the timing of retirement. The results showed that employees who retired earlier on an old-age pension and who were not working afterwards had lower incomes. Their incomes also decreased after old-age retirement. Employees who worked for several years in retirement had higher incomes which remained stable between the ages of 62 and 70. We found two types of self-employed persons: those who continued working in retirement with high incomes and those who stopped working earlier and had lower incomes. The results indicate that inequalities between lower and higher income groups might become exacerbated in a flexible retirement system.

Keywords: working in retirement, post-retirement work, income, sequence analysis

Introduction

Recent literature has emphasized that retirement is a process, not a single event (Beehr & Bennett, 2015; Cahill et al., 2006). Despite a growing consensus in the literature that retirement is rarely a single and full transition from work to receiving a pension, most studies still use data and methods where only one time point is observed (e.g., using cross-sectional data) or where one transition (e.g., from retirement back to work or from salaried employment to self-employment) is analyzed. In this research report we wish to shed light on the whole retirement process across ages and attempt to find typical patterns in transitions. We propose that sequence analysis is a suitable method for such an exercise.

Today, more than ever, a growing number of people return to work after retirement (Gianrea et al., 2010; Scherger, 2015; Sullivan & Ariss, 2019). Typically, return to work after retirement occurs quickly after retirement and is for a relatively short period (Platts et al., 2019). People who are highly motivated to work and desire to contribute to society are known to work more often after retirement (Fasbender et al., 2016; van der Zwaan et al., 2019), but financial factors also make a difference, especially among low socioeconomic groups (Hofäcker & Nauman, 2015). Working after retirement has also been found to be more common among self-employed persons (Wahrendorf et al., 2017). For retired employees, self-employment may be a "bridge" between retirement and a way to earn income (Cahill et al., 2013; Halvorsen & Morrow-Howell 2017; Hochguertel, 2015).

Pension systems with flexible retirement ages, such as those in most Nordic countries, Canada and the USA, offer larger possibilities to combine work and retirement than systems with a single (fixed) statutory retirement age. Later retirement is usually rewarded with higher pension benefits. Work in retirement in this flexible retirement context is less studied. In this research report, we use Finland as a case study to analyze the patterns of old-age retirement and work in retirement among those retiring from employment and self-employment at a flexible retirement age. We use the term retirement when a person is taking out an old-age pension. Working in retirement means post-retirement work, that is, when a person is working while drawing an old-age pension.

Lastly, the development of income and its relation to various combinations of work and retirement is an understudied topic. While studies often assume that financial considerations play an important role in decisions to work, retire or work in retirement, we argue that the relations between financial incentives and these decisions are often complex and the causality difficult to establish (Hansson et al., 2023; Petterson

2014). Therefore, by illustrating how average income develops among these typical patterns of retirement, we aim to uncover some of the complex relations that exist between income and the retirement transition process, and how inequalities develop between individuals as they work and retire at various ages.

The Finnish pension system

In the Finnish pension system with a flexible retirement age, employees, and self-employed persons born in 1949 could retire on an old-age pension between the ages of 63 and 68. The Finnish statutory pension system (1st pillar) includes the employment-based earnings-related pension and residence-based national and guarantee pensions. The earnings-related pension system is a defined benefit system where the pension level is determined by the length of work history and the amount of past earnings. The earnings-related system is mandatory and covers all workers (also the self-employed) and virtually all earnings. Pension accrues throughout working life with contributions paid by employees and employers. Statutory pensions are broad in scope, and there is no ceiling to the pensionable earnings or the pension amount. Contrary to what is the case in many other countries, the role of occupational and private pensions is minor in Finland.

Material and methods

This study is based on total Finnish register data of the 1949 birth cohort. The register data collected by Statistics Finland included information about work, retirement, and annual income of the 1949 birth cohort between the years 2011 and 2019. The cohort comprised 80,068 living persons aged 62 in 2011. We restricted our analysis to employees and self-employed persons who were in paid work and received earnings from work in 2011. This way we could focus on those with a relatively stable labor market attachment who could postpone old-age retirement and continue working after retirement. Furthermore, we excluded those who drew a full or partial disability pension at the end of the year 2011 and those who died or moved abroad between the years 2012 and 2019. In Finland, unemployment and disability retirement are common routes to retirement (over 20% were unemployed and 25% on a disability pension before old-age retirement). After the restrictions, the number of observations was 30,705, which was 38% of the 1949 birth cohort alive in 2011.

The employment before old-age retirement was derived from the main type of activity at the end of each year. The classification "employee" or "self-employed" was based on income sources in the same year. Information about working in retirement was derived from annual earnings exceeding 5,000€ (in 2019 prices). The limit can be seen to represent a relevant level of annual income from paid work or self-employment and has been used as such in similar previous studies (see e.g., Polvinen et al., 2022). We also performed sensitivity analyses with a lower (€3,000) and a higher (€8,000) earnings limit to define working in retirement (see Supplementary Material). Annual information about receiving an old-age pension was collected at the end of each year while information of working in retirement was collected in the following year. For instance, if a person is working during the first 3 months of the year and then fully retires, they are classified as "retired who does not work in retirement" (providing they do not work in the following year either). If the same person starts to receive income from paid work or self-employment, for example, 3 years after retirement, then they are coded as "retired who works in retirement" that year.

Sequence and cluster analysis

Sequence and cluster analyses were used to create sequences of the annual statuses for employees and the self-employed, observing their old-age retirement and working in retirement statuses and identifying typical patterns therein. Sequence analysis is a family of methods that allows an analysis of states and transitions in their continuum instead of focusing on single events or transitions only (Abbott, 1995; Aisenbrey & Fasang, 2010; Liao et al., 2022). Optimal matching techniques were used to measure similarities and distances between pairs of sequences. We used the Ward method for clustering and the TraMineR and WeightedCluster packages for analyzing (Gabadinho et al., 2011; Studer, 2013).

Following the cluster analysis, we chose a ten-cluster solution. We compared the performance of various cluster solutions on the Average Silhouette Width (ASW) values for cluster quality (Studer, 2013) and assessed a meaningful distinction between clusters (Liao et al., 2022; Picarretta & Studer, 2019). Although ASW was highest for the three-cluster solution (0.56), we selected the ten-cluster solution (ASW = 0.52) as it indicated an almost equally-high cluster quality but allowed for more detailed observations in its distinction between clusters related to employment, self-employment and work in retirement.

Results

Figure 1 shows the transitions in and out of work and retirement from ages 62 to 70. Approximately 40% of the study population retired on an old-age pension at the age of 63. The share of old-age pensioners increased every year until age 68, when practically everyone was receiving an old-age pension. Simultaneously, the share of working individuals decreased over time.

Optimal matching techniques and cluster analysis yielded the ten clusters. We found four clusters for employees who were not working in retirement or who worked only for a limited time and retired at different ages (Figure 2). Four clusters were found for employees who worked in retirement (Figure 3). Two clusters were found for the self-employed (Figure 4). Additionally, each cluster's gross income, earned income from paid work and self-employment and pension income between the ages from 62 to 70 are presented.

Clusters 1.1–1.4 accounted for 62% of the total study population (Figure 2). Cluster 1.1 included employees who retired on an old-age pension at age 63 and were not working after retirement (22.6%). Cluster 1.2 included employees who retired at age 64 and were not working. Cluster 1.3 included employees who retired at age 65 or 66. Only few of them worked in retirement and only for a limited time. Cluster 1.4 was notably smaller and included employees who retired at age 67 or 68. Again, only few were working in retirement. The average gross income, earned income and pension income were lowest in cluster 1.1 and highest in cluster 1.4.
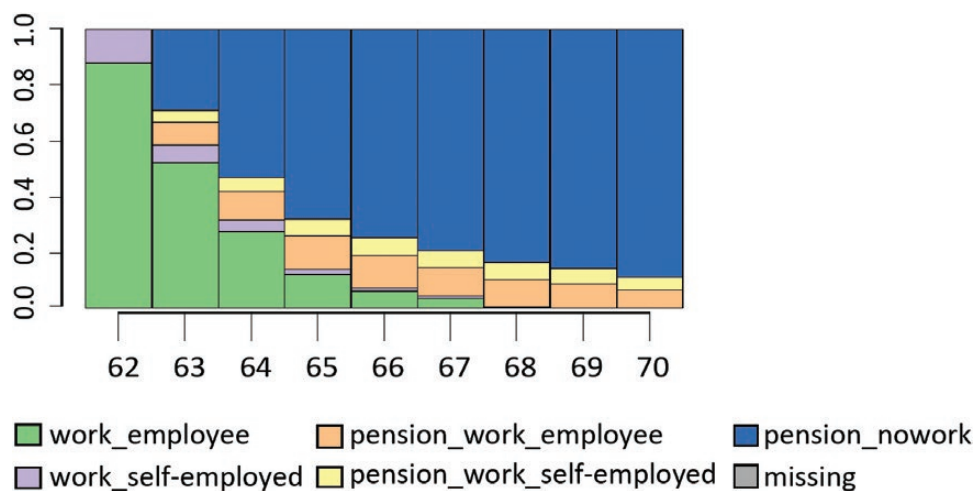
Figure 1. Transitions in and out of work and retirement from ages 62 to 70.

Figure 3 shows that 26% of the total study population were grouped in the four clusters which included those who continued to work as employees after taking out an old-age pension. The clusters differed by timing of retirement and the length of working period after retirement. In cluster 2.1, retirement occurred close to the lowest possible retirement age, but almost all in this cluster continued to work until the age of 69 or 70 (and possibly even older). The size of this cluster was small. In cluster 2.2, retirement occurred at a similarly early stage, but the working period was shorter. Cluster 2.3 included employees who postponed their retirement and continued working in retirement for a relatively long period. Cluster 2.4 included employees who retired rather early and worked for only 1 or 2 years. This was the largest cluster among clusters 2.1–2.4. Among these clusters, the average gross income and earned income were highest in clusters 2.1 and 2.3 in which working in retirement was also most frequent.

Figure 4 shows the two clusters for the self-employed. This group of clusters accounted for approximately 12% of the total study population. Retirement in both these clusters occurred between ages 63 and 68. Cluster 3.1 included those self-employed who continued to work in retirement throughout the follow-up period. Cluster 3.2 included those self-employed who did not work in retirement or worked only for relatively short periods. Compared to cluster 3.1, the average gross income and earned income was substantially lower in cluster 3.2, but the average pension income was relatively similar (low) in both clusters.

We also explored clusters by individual-level factors to identify some of the potential differences in the backgrounds of individuals in these clusters (Table 1). The descriptive results showed that women retired earlier and worked in retirement less often than men. The high-educated employees retired later and continued to work longer in retirement than low-educated. The self-employed were more often men and relatively low-educated.

Discussion

Our research report showed large variation in retirement and working after retirement among Finnish employees and self-employed persons born in 1949 in a scheme with a flexible old-age retirement age. Our study corroborates the currently prevailing view in the literature that retirement is a process and not necessarily a single and full transition. Using sequence analysis, we were able to detect and visualize the frequency and complexity of transitions between different combinations of employment, self-employment and retirement, as well as link these to the individual's income development.

We found relatively large income and educational differences in old-age retirement and working in retirement. Later old-age retirement and longer working in retirement were associated with higher incomes. The average income level decreased when people were retired and were not working. Working throughout the follow-up period was associated with a relatively stable average gross income, which was mainly due to income received from work. Moreover, our results showed that those who retired early and did not continue working in retirement more often had a lower than higher education. Working in retirement seemed to be relatively common both among the low- and high-educated, but those who worked the longest in retirement were more often highly educated. These differences in working may be due to inequalities between socioeconomic groups. Those with a higher socioeconomic status are more often better able to postpone retirement and continue working after retirement. They are often in better health, have less demanding working conditions and a wider selection of employment opportunities than those with a lower socioeconomic status (Mackenbach et al., 2008; Robroek, et al., 2015; Schaap et al., 2020). Also, previous Finnish studies have found relatively large educational differences in working among those near and beyond their retirement age (Polvinen et al., 2022; Riekhoff & Kuitto, 2022).

Even though many self-employed persons seemed to end up working relatively late, their pension income was lower than that of employees. At least part of this is related to underinsurance among many self-employed (Nivalainen & Tenhunen, 2020). In the Finnish pension system, a self-employed person can claim their old-age pension and continue to work as before. In addition, pension insurance is not mandatory for retired self-employed persons. However, for some self-employed persons, working after retirement may be a way to stay active or try something new. For some, it may be a financial necessity (Cahill et al., 2011).
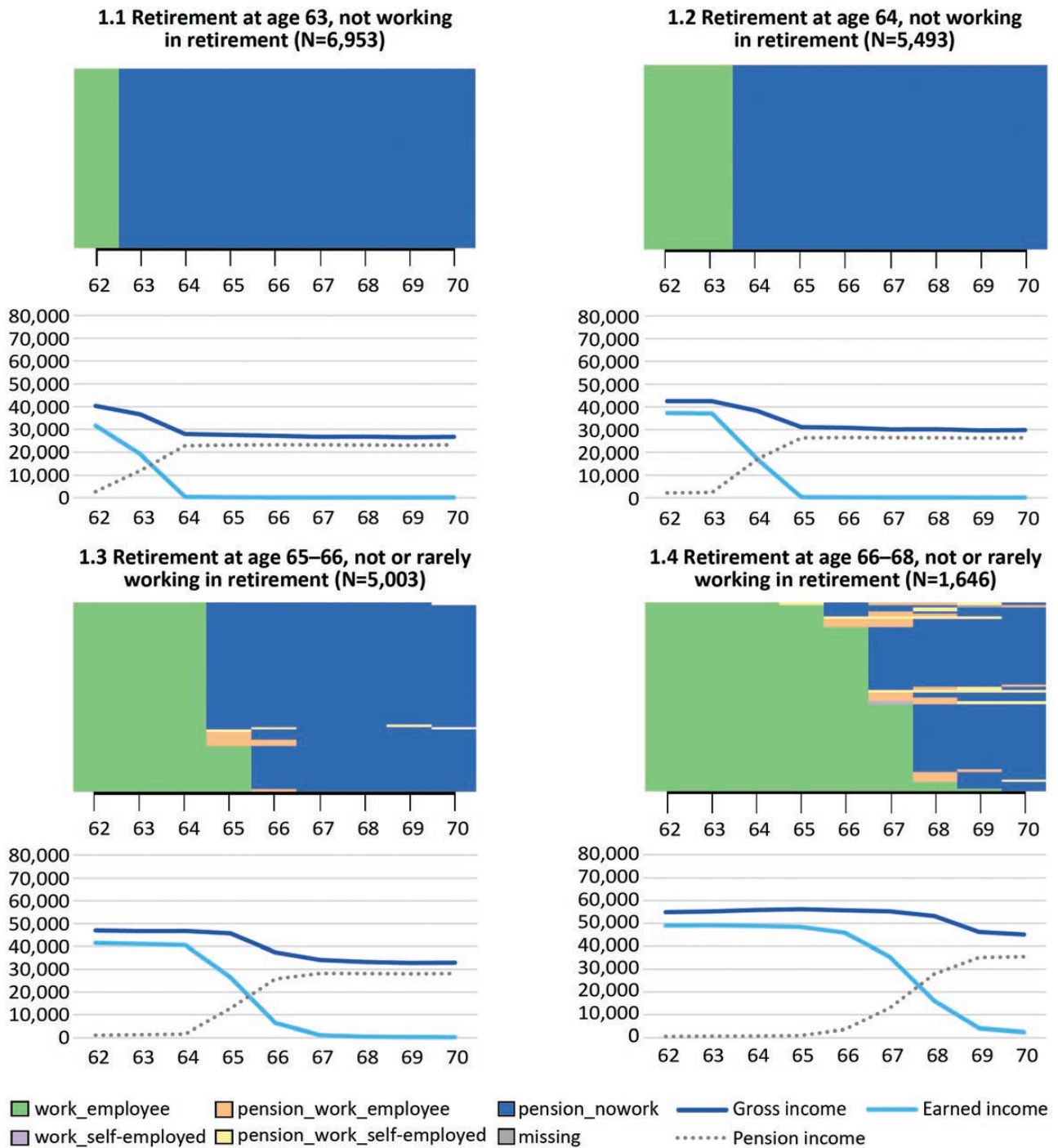
1.1 Retirement at age 63, not working in retirement (N=6,953)

1.2 Retirement at age 64, not working in retirement (N=5,493)

1.3 Retirement at age 65–66, not or rarely working in retirement (N=5,003)

1.4 Retirement at age 66–68, not or rarely working in retirement (N=1,646)

Legend: work_employee | pension_work_employee | pension_nowork | Gross income | Earned income
work_self-employed | pension_work_self-employed | missing | Pension income

Figure 2. Employees not working or working only a little in retirement (mean annual gross income, earned income and pension income at ages 62–70, €).

Finland has a flexible retirement age, which offers more variation regarding the timing of retirement and the possibilities to combine work and retirement than do systems with a single (fixed) statutory retirement age. We have excellent register data to explore retirement and working in retirement. Finland is also a good case when exploring retirement patterns because of the dominance of statutory pensions. The whole cohort has similar eligibility and entitlement rules, and diverging rules for occupational and private pensions do not affect the retirement decision in

Finland to the same extent as in many other countries, such as the USA or Canada.

Our main conclusion is that while the Finnish pension system promotes flexibility in the timing of retirement and the possibility to combine work and receiving a pension, the possibilities to postpone old-age retirement and continue working in retirement are distributed unequally. This may contribute to growing income inequalities in older age. All in all, more research on how earnings and pensions play differentiating roles in the decision to work and retire is
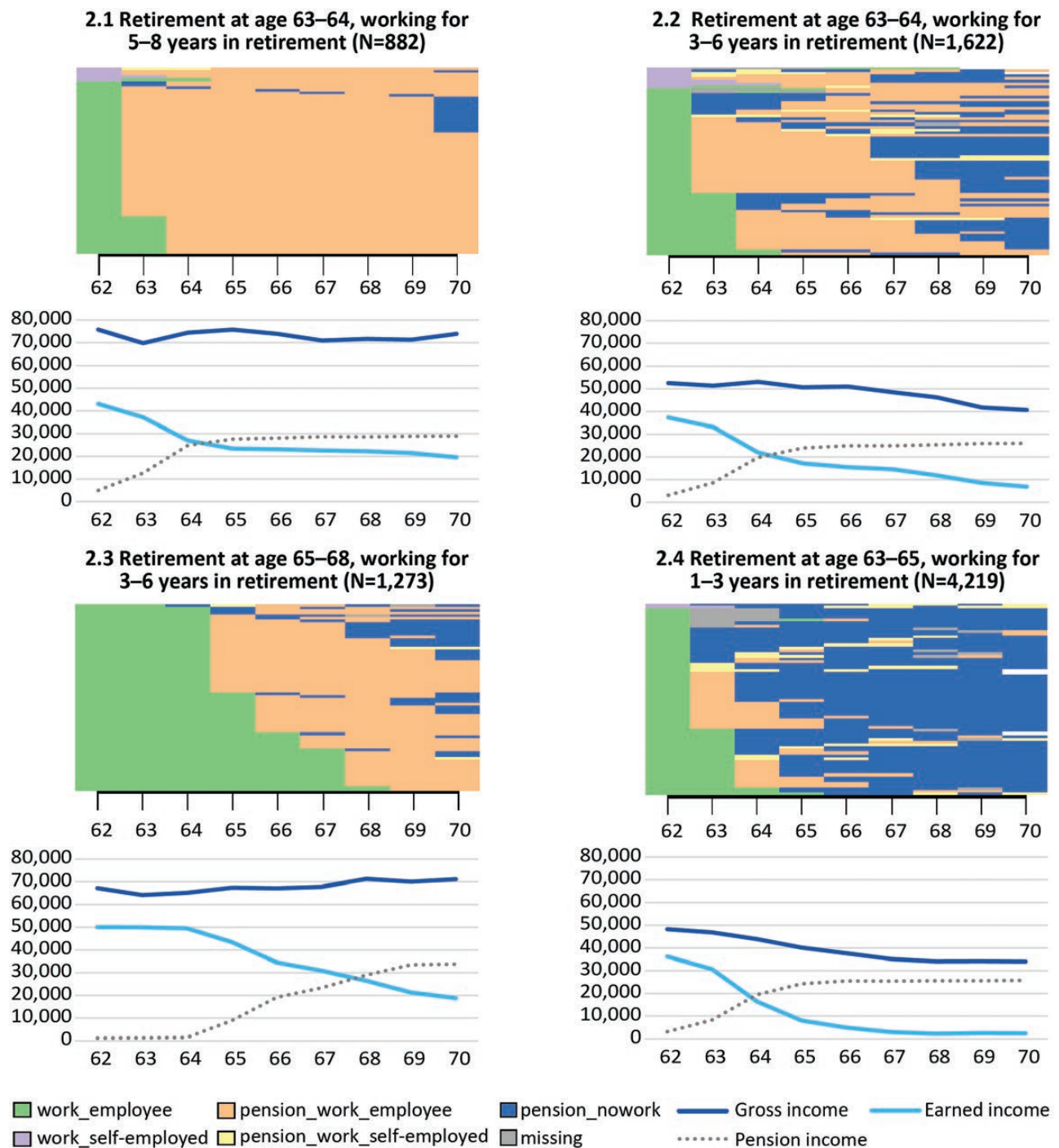
Figure 3. Employees working in retirement (mean annual gross income, earned income, and pension income at ages 62–70, €).

needed. Furthermore, similar and more advanced research in other countries could help to further develop a research agenda that does justice to the complex process of retirement.

Supplementary material

Supplementary material is available online at *Work, Aging, and Retirement*.

Data availability

The authors used individual-level register data from Statistics Finland. Due to legal restrictions and data protection regulations, the authors do not have the permission to make sensitive personal data available.

Author contributions

Anu Polvinen (Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing), Aart-Jan Riekhoff (Conceptualization, Writing – original draft, Writing – review & editing), Satu Nivalainen (Conceptualization, Writing – original draft, Writing – review & editing), and Susan Kuivalainen (Conceptualization, Writing – original draft, Writing – review & editing)
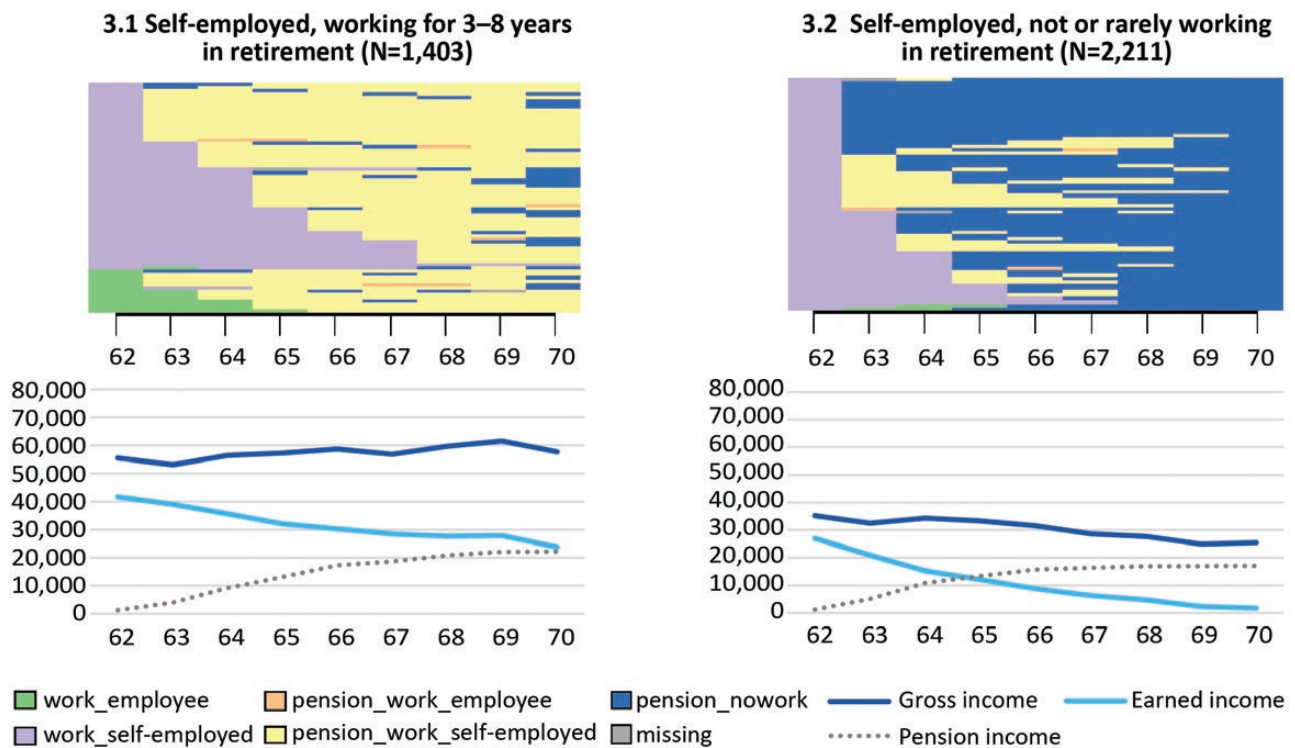
Figure 4. Plots for the self-employed (mean annual gross income, earned income, and pension income at ages 62–70, €).

Table 1. Descriptive statistics of clusters, %.

Cluster	Employees								Self-employed persons		All
	Not working in retirement				Working in retirement						
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	
N	6,953	5,493	5,003	1,646	882	1,622	1,273	4,219	1,403	2,211	30,705
%	22.6	17.9	16.3	5.4	2.9	5.3	4.1	13.7	4.6	7.2	100.0
Gender											
Men	21.3	13.8	13.4	5.0	3.9	6.4	4.6	15.6	7.1	8.9	100.0
Women	23.9	21.6	18.9	5.7	1.9	4.3	3.7	12.1	2.3	5.6	100.0
Education											
Basic	27.1	15.7	12.5	3.4	3.2	5.1	3.6	13.5	5.6	10.2	100.0
Secondary	24.6	17.8	15.6	3.8	2.5	5.6	3.7	13.5	4.7	8.2	100.0
Lower tertiary	20.8	19.6	18.1	6.4	3.1	5.1	4.3	14.5	3.4	4.5	100.0
Higher tertiary	10.5	20.7	22.9	12.2	2.8	5.1	6.5	13.1	4.3	3.3	100.0

Funding

References

Abbot, A. (1995). Sequence analysis: New methods for old ideas. *Annual Review of Sociology*, 21, 93–113.

Aisenbrey, S., & Fasang, A. E. (2010). New life for old ideas: The "second wave" of sequence analysis bringing the "course" back into the life course. *Sociological Methods & Research*, 38(3), 420–462. https://doi.org/10.1177/0049124109357532

Beehr, T. A., & Bennett, M. M. (2015). Working after retirement: Features of bridge employment and research directions. *Work, Aging and Retirement*, 1(1), 112–128. https://doi.org/10.1093/workar/wau007

Cahill, K., Giandrea, M., & Quinn, J. (2006). Retirement patterns from career employment. *The Gerontologist*, 46(4), 514–523. https://doi.org/10.1093/geront/46.4.514

Cahill, K., Giandrea, M., & Quinn, J. (2011). Reentering the labor force after retirement. *Monthly Labor Review*, 134(6), 34–42.

Cahill, K. E., Giandrea, M. D., & Quinn, J. F. (2013). New evidence on self-employment transitions among older Americans with career jobs. BLS Working Paper 463.

Fasbender, U., Wang, M., Voltmer, J. B., & Deller, J. (2016). The meaning of work for post-retirement employment decisions. *Work, Aging and Retirement*, 2(1), wav015–wav023. https://doi.org/10.1093/workar/wav015

Gabadinho, A., Ritschard, G., Müller, N. S., & Studer, M. (2011). Analyzing and visualizing state sequences in R with TraMineR.

Journal of Statistical Software, 40(4), 1–37. https://doi.org/10.18637/jss.v040.i04

Gianrea, M. D., Cahill, K. E., & Quinn, J. F. (2010). The role of re-entry in the retirement process. BLS Working Papers 439.

Halvorsen, C. J., & Morrow-Howell, N. (2017). A conceptual framework on self-employment in later life: Toward a research agenda. *Work, Aging and Retirement*, 3(4), waw031–waw324. https://doi.org/10.1093/workar/waw031

Hansson, I., Henkens, K., & van Solinge, H. (2023). Motivational drivers of temporal dynamic in postretirement work. *The Journals of Gerontology*, 78(1), 178–189. https://doi.org/10.1093/geronb/gbac130

Hochguertel, S. (2015). Self-employment around retirement age. Netspar Discussion Paper 07/2010.

Hofäcker, D., & Naumann, E. (2015). The emerging trend of work beyond retirement age in Germany Increasing social inequality? *Zeitschrift fuer Gerontologie und Geriatrie*, 48(5), 473–479. https://doi.org/10.1007/s00391-014-0669-y

Liao, T. F., Bolano, D., Brzinsky-Fay, C., Cornwell, B., Fasang, A. E., Helske, S., Piccarreta, R., Raab, M., Ritschard, G., Struffolino, W., & Studer, M. (2022). Sequence analysis: Its past, present, and future. *Social Science Research*, 107, 102772. https://doi.org/10.1016/j.ssresearch.2022.102772

Mackenbach, J. P., Stirbu, I., Roskam, A. -J. R., Schaap, M. M., Menvielle, G., Leinsalu, M., & Kunst, A. E. (2008). Socioeconomic inequalities in health in 22 European countries. *The New England Journal of Medicine*, 358(23), 2468–2481. https://doi.org/10.1056/NEJMsa0707519

Nivalainen, S., & Tenhunen, S. (2020). Kuinka yrittäjät eläkevakuuttavat? Yrittäjien omat näkemykset ja YEL-työtulon ja yrittäjän tulojen suhde. *Eläketurvakeskuksen tutkimuksia*.

Pettersson, J. (2014). Instead of bowling alone? Unretirement of pensioners in Sweden. *International Journal of Manpower*, 35(7), 1016–1037. https://doi.org/10.1108/ijm-09-2012-0136

Piccarreta, R., & Studer, M. (2019). Holistic analysis of the life course: Methodological challenges and new perspectives. *Advances in Life Course Research*, 41, 100251–100211. https://doi.org/10.1016/j.alcr.2018.10.004

Platts, L. G., Corna, L. M., Worts, D., McDonough, P., Price, D., & Glaser, K. (2019). Returns to work after retirement: A prospective study of unretirement in the United Kingdom. *Ageing & Society*, 39(3), 439–464. https://doi.org/10.1017/s0144686x17000885

Polvinen, A., Riekhoff, A. -J., Nivalainen, S., & Kuivalainen, S. (2022). Educational inequalities in employment of Finns aged 60–68 in 2006–2018. *PLoS One*, 17(10), e0276003. https://doi.org/10.1371/journal.pone.0276003

Riekhoff, A. -J., & Kuitto, K. (2022). Educational differences in extending working lives Trends in effective exit ages in 16 European countries. *Finnish Centre for Pensions, Studies*.

Robroek, S. J. W., Rongen, A., Arts, C. H., Otten, F. W. H., Burdorf, A., & Schuring, M. (2015). Educational inequalities in exit from paid employment among Dutch workers: The influence of health, lifestyle and work. *PLoS One*, 10(8), e0134867. https://doi.org/10.1371/journal.pone.0134867

Schaap, R., Schaafsma, F. G., Bosma, A. R., Huysmans, M. A., Boot, C. R. L., & Anema, J. R. (2020). Improving the health of workers with a low socioeconomic position: Intervention Mapping as a useful method for adaptation of the participatory approach. *BMC Public Health*, 20(1), 961. https://doi.org/10.1186/s12889-020-09028-2

Scherger, S. (Ed.) (2015). Paid work beyond pension age. In *Comparative perspectives*. Palgrave Macmillan.

Studer, R. (2013). WeightedCluster library manual: A practical guide to creating typologies of trajectories in the social sciences with R. LIVES Working Paper 24.

Sullivan, S. E., & Ariss, A. A. (2019). Employment after retirement: A review and framework for future research. *Journal of Management*, 45(1), 262–284. https://doi.org/10.1177/0149206318810411

van der Zwaan, G. L., Oude Hengel, K. M., Sewdas, R., de Wind, A., Steenbeek, R., van der Beek, A., & Boot, C. R. L. (2019). The role of personal characteristics, work environment and context in working beyond retirement: A mixed-methods study. *International Archives of Occupational and Environmental Health*, 92, 535–549. https://doi.org/10.1007/s00420-018-1387-3

Wahrendorf, M., Akinwale, B., Landy, R., Matthews, K., & Blane, D. (2017). Who in Europe Works beyond the state pension age and under which conditions? Results from SHARE. *Journal of Population Ageing*, 10(3), 269–285. https://doi.org/10.1007/s12062-016-9160-4