

[Philipp Hessel](#) and [Mauricio Avendano](#)

Are economic recessions at the time of leaving school associated with worse physical functioning in later life?

**Article (Accepted version)
(Refereed)**

Original citation:

Hessel, Philipp and Avendano, Mauricio *Are economic recessions at the time of leaving school associated with worse physical functioning in later life?* [Annals of epidemiology](#) . ISSN 1047-2797 (In Press)

DOI: [10.1016/j.annepidem.2013.08.001](https://doi.org/10.1016/j.annepidem.2013.08.001)

© 2013 [Elsevier Inc](#)

This version available at: <http://eprints.lse.ac.uk/52840/>

Available in LSE Research Online: October 2013

LSE has developed LSE Research Online so that users may access research output of the School. Copyright © and Moral Rights for the papers on this site are retained by the individual authors and/or other copyright owners. Users may download and/or print one copy of any article(s) in LSE Research Online to facilitate their private study or for non-commercial research. You may not engage in further distribution of the material or use it for any profit-making activities or any commercial gain. You may freely distribute the URL (<http://eprints.lse.ac.uk>) of the LSE Research Online website.

This document is the author's final accepted version of the journal article. There may be differences between this version and the published version. You are advised to consult the publisher's version if you wish to cite from it.

Are economic recessions at the time of leaving school associated with worse physical functioning in later life?

by Philipp Hessel & Mauricio Avendano

Abstract

Purpose: This paper examines whether economic conditions at the time of leaving school or college are associated with physical functioning at old age among cohorts in 11 European countries.

Methods: Data came from 10,338 participants in the Survey of Health, Ageing and Retirement in Europe (SHARE) aged 50-74 who left school or college between 1956 and 1986. Data on functional limitations, as well as employment, marriage and fertility retrospective histories were linked to national unemployment rates during the year individuals left school. Models included country-fixed effects and controls for early-life circumstances.

Results: Higher unemployment rates during the school-leaving year were associated with fewer functional limitations at ages 50-74 among men (RR[Rate ratio]=0.63, 95%CI=0.47-0.83), but more physical functioning limitations among women (RR=1.30, 95%CI=1.13-1.50), particularly with (post-)secondary education. Economic conditions at the age of leaving school were associated with several labor market, marriage, fertility and health behavior outcomes, but controlling for these factors did not attenuate associations. Results were similar in models that controlled for selection into higher education due to measured covariates.

Conclusions: Worse economic conditions during the school-leaving year predicted better health at old age among men but worse health among women. Both selection and causation mechanisms may explain this association.

KEYWORDS: Activities of Daily Living, Mobility Limitation, Europe, Economic Recession, Functional status

Abbreviations

| | | |
|-----------|--|-------------|
| ADL | Activities of Daily Living | |
| HP-Filter | Hodrick-Prescott Filter | |
| IADL | Instrumental Activities of Daily Living | |
| ISCED | International Standard Classification of | Education |
| ISCO | International Standard Classification of Occupations | |
| OR | Odds ratio | |
| RR | Rate ratio | |
| OECD | Organization for Economic Cooperation and | Development |
| RR | Rate Ratio | |
| SHARE | Survey of Health Ageing and Retirement in | Europe |

Introduction

The recent financial crisis has led to a sharp increase in youth unemployment rates in many European countries, with Spain and Greece experiencing unemployment rates as high as 40% for ages 15-24 [1]. Recent reports have warned of the emergence of a 'lost generation' of young graduates unable to make the transition from school to work, who might suffer poor future career prospects and substantial earning losses up to fifteen years after graduation [2-4]. While recent research has emphasized the short-term effects of recessions on health [5, 6], there has been little emphasis on the permanent effects of economic recessions during the transition from school to work on health in middle and old ages.

Several mechanisms have been proposed to explain the link between economic downturns and health. In the short-run, economic contractions may influence health by increasing the stress associated with economic insecurity and unemployment [7] changing behavior [8, 9] or influencing the delivery of health and other social services. Paradoxically, some studies suggest that economic contractions may bring some health benefits and lead to declines in mortality from some causes [5, 10]. According to these studies, temporary economic downturns may promote healthy living, discouraging smoking and alcohol consumption, while providing more time for physical activity and a healthy diet [5, 8, 9, 11]. Most of these studies, however, have focused on short-term and temporary changes in health, while less is known about the long-term, permanent

effects of economic contractions experienced during early adulthood on health in later life.

Recent research suggests that economic recessions experienced around birth, a critical developmental period, are associated with increased mortality during old age [12]. Likewise, an economic recession during the transition from school to work, another critical life-course period [13, 14], may trigger a pathway towards cumulative disadvantage characterized by less favorable and unstable labor market trajectories [2-4], which may ultimately lead to poorer health later in life. On the other hand, seminal work by Glen Elder based on the Oakland study suggested that children exposed to the Great Depression followed a trajectory of resilience into the middle years of life [15]. These children became nearly as accomplished in midlife as youth who had not experienced hardship, partly due to the higher educational opportunities made available to war veterans by the GI Bill of Rights [15].

Based on data for 11 European countries, this paper examines the association between macroeconomic conditions during school leaving age and functional status at old age for individuals who completed their education between 1956 and 1986. We focused on functional status because it reflects cumulative disadvantage over the life-course. We hypothesized that effects differ by educational attainment. Previous research suggests that recessions in early adulthood have stronger negative effects on the labor market careers of lower-skilled and lower-educated workers, but in the long-run, lower-educated workers recover faster than their middle-or higher-educated workers, who

suffer larger permanent earnings losses [3, 16] to shed light on some of the potential mechanisms, we also examine how economic conditions around the year of school-leaving age relate to labor market, marriage, fertility and behavioral outcomes. Our study is innovative by linking individual life history event data from the Survey of Health, Ageing and Retirement in Europe (SHARE) to macro-data on unemployment rates between 1956 and 1986.

Methods

Data

SHARE is a longitudinal, nationally representative survey designed to provide comparable information on the health, employment and social conditions of Europeans aged 50+ in 13 countries (Sweden, Denmark, Austria, France, Germany, Switzerland, Belgium, the Netherlands, Spain, Italy, Greece, Poland and the Czech Republic as well as Ireland and Israel). Specific details on the survey are available elsewhere [17-20]. Participants in each country were interviewed in 2004/5 and subsequently re-interviewed in 2006/7 and 2008/9. Expert agencies translated items, with extensive pre-testing to ensure comparability. Response rates varied from country to country, but overall household response at enrolment was 62% [17-20].

Our study is primarily based on data from the third wave of SHARE conducted in 2008/9, which collected retrospective life-histories expanding through early childhood until last interview. We included respondents who completed the life-history assessment and who

had enrolled in the study in either 2004/5 or 2006/7. Data from the Czech Republic and Poland were not included due to lack of comparable data on unemployment rates before 1990. Ireland and Israel were also excluded because they did not participate in the life history interview. The total sample included 20,780 participants. We restricted the sample to participants aged 50 to 74 years who left school after 1956 (N=12,716), the earliest year for which comparable information on unemployment rates were available. We excluded individuals with missing values on educational level (n=230), functional limitations (n=15), and control variables or sampling weights (n=237). To allow for a lag time of at least 20 years, we excluded participants who graduated after 1986 (n=50). We also excluded participants who left school before age 14 (n=1,068) and those graduating after age 27 (n=778) because their school leaving age deviated significantly from the European average. However, including these cohorts did not change substantive results. The final sample comprised 10,338 men and women from 11 countries who were born between 1934 and 1959 and graduated between 1956 and 1986 (APPENDIX Table 1).

Functional status

Functional status was measured by self-reported difficulties with activities to maintain basic self-care needs [21] using three scales: The Katz Activities of Daily Living (ADL) scale, assessing difficulties with six basic self-care tasks (bathing, dressing, toileting, transferring, continence, and eating) [22]; the index of Instrumental Activities of Daily Living (IADL), assessing difficulties with more advanced activities (using a map, preparing hot meals, shopping, telephone use, taking medications, housekeeping tasks,

and managing money) [23]; and an index of mobility partly based on the Nagi-scale[24], which assessed difficulties with 10 mobility and fine motor control items such as walking 100 meters, sitting two hours and climbing stairs. We then constructed a summary score based on the number of difficulties reported for any of the three scales.

Macro-economic conditions in the year of leaving school or college

The unemployment rate as a percentage of the civilian labor force was obtained from the Organization for Economic Cooperation and Development (OECD) annual labor force statistics, and was used as indicator of macro-economic conditions [25]. To isolate the business cycle from secular trends in unemployment, we detrended the unemployment series using the Hodrick-Prescott-filter applying a smoothing parameter of 100 (HP) [26]. The HP-filter, typically used for the analysis of business cycles [12, 27], separates the cyclical pattern of a time series from its general trend. It can be interpreted as the relative annual deviation in the unemployment rate from the smoothed time trend. We identified the school-leaving year by asking each participant 'in which year did you finish continuous full-time education at school or college?'. For each individual, we matched the country-specific unemployment rate and trend deviation based on the reported year of leaving full-time education. To account for patterns of migration across countries, merging was based on country of birth.

Control and early childhood variables

Control variables included sex, year of birth, country of birth and educational attainment, based on three broad categories from the International Standard Classification of

Education (ISCED) [28]. We incorporated extensive measures of childhood conditions to control for systematic differences in functional status between individuals leaving school in different states of the economy, including: (a) self-rated health during childhood; (b) an index of childhood deprivation based on items available at the parental home (e.g. a fixed bath, water supply or central heating); (c) self-reported diagnosis of major childhood illnesses (infectious, non-communicable or mental/cognitive); (d) the occupation of the main breadwinner based on four major categories from the International Standard Classification of Occupations (ISCO) [29]; (e): the number of books in the parental home; (f): having missed school due to illness for more than one month; and (g): having lost a parent before reaching age 16.

Potential mechanisms

Based on the retrospective histories, we constructed a set of indicators of labor market, fertility and marriage outcomes in the first 10 years after leaving school. We focused on this period because prior evidence indicates that the effects of economic conditions at graduation last for approximately 10 years [4] Indicators included having an employment gap of at least six months immediately after leaving school or at least once in the 10 years after leaving school. We distinguished gaps due to lay-off or a worker's plant been closed down from gaps due to other reasons ('resigned', 'mutual agreement', 'a temporary job had been completed', 'retired', or 'other reason'). We also constructed indicators for whether individuals experienced fluctuations between full-time and part-time working hours at least once in the 10 years after leaving school; and the age at first marriage and first childbirth. We furthermore incorporated measures of whether

individuals reported drinking more than two glasses of alcohol almost every or 5/6 days a week at the time of interview, and whether they currently smoked.

Statistical analysis

We implemented a country-fixed effect Poisson model, which regressed the number of functional limitations on country-specific economic conditions in the year of leaving school. In this model, the impact of macroeconomic fluctuations is identified by within-country variations in unemployment rates in the school leaving year, relative to changes occurring in other countries. These estimates automatically control for cross-country differences in determinants of health that are time-invariant (e.g., lifestyles, geographic factors), as well as determinants that vary over time but spread rapidly across countries (e.g., medical technologies) [10]. The basic model was as follows:

$$\text{Ln}(D_i) = \alpha_i + X_i\beta + E_{ct}\gamma + C_c + T_t + \varepsilon_i$$

where $\text{Ln}(D_i)$ is the natural logarithm of the ADL, IADL and mobility index for individual i , α_i is the intercept, X_i is a vector of individual-level controls, $E_{ct}\gamma$ is a proxy for economic conditions (annual deviations from the unemployment trend) for country c at year of leaving full-time education t , and ε_i is the error term. The country-fixed effect C_c controls for all unmeasured differences across countries such as institutional characteristics or levels of functional health, while the year fixed-effect T_t controls for time-varying factors that changed homogeneously across countries [10].

Models were implemented separately by sex given major differences in labor market trajectories and the potential for differential effects between women and men [13, 30]. To assess whether relationships varied by educational attainment, we included interactions between educational level and the deviations of the unemployment rate in the year of leaving school. To explore possible mechanisms, we used logistic or linear regression to relate economic conditions at school-leaving age to subsequent labor market, marriage, fertility and health behavior outcomes.

Individuals may decide to stay longer or shorter in full-time education due to the economic conditions during the schooling years, potentially leading to selection. For example, individuals with a higher socioeconomic background may be more likely to stay longer at school during adverse economic times until the economy improves. This selection may lead to compositional differences between educational groups due to economic conditions around the schooling years. To explore the impact of this selection mechanism, we first assessed whether childhood health and socioeconomic characteristics predicted unemployment rate deviations at the time of graduation. We then implemented a Heckman selection model to explicitly account for selection associated with educational attainment. In the first stage, we modeled the probability of having secondary or higher education (inverse Mills ratio) as a function of childhood health and socioeconomic characteristics [31]. The inverse Mills ratio was then included in the Poisson models to account for selective educational attainment associated with economic conditions around the school-leaving years.

Standard errors were clustered by country and regression estimates exponentiated to obtain rate ratios (RR) and corresponding 95% confidence intervals (CI). Analyses were conducted in Stata/SE 11.2 using weights that controlled for the sampling design, survival and attrition across waves[32].

Results

Main results

APPENDIX Table 1 shows basic sample descriptives. 34% of respondents reported having at least one limitation with physical functioning, but this ranged from 25% in Switzerland to 43% in Austria. Over two thirds of respondents left school during a year of unemployment lower than 3%, while 15% left school during a year of unemployment of 5% or higher. Within each country, there were large fluctuations around the unemployment trend (Figure 1).

Figure 1 about here

Panel A of Figure 2 shows predicted means of functional limitation scores according to country-specific tertile of unemployment deviation at the school-leaving year, controlling for age and country of birth. For men, there were no consistent differences in functional status for cohorts leaving school at different levels of unemployment. In contrast, among women, completing school in a year of higher unemployment was associated with higher levels of limitations at ages 50-74. For example, women who left school during a

year in the highest tertile of unemployment had on average 0.93 limitations, as opposed to 1.13 limitations for cohorts leaving school in a year in the lowest tertile of unemployment. Results stratified by educational level (Panels B and C) revealed no clear associations among men. Among women, unemployment rates in the year of leaving school were associated with more old-age limitations among middle- and higher-educated women, while there was no association for women with primary education.

Figure 2 about here

Table 1 shows estimates of the effect of an increase in unemployment in the year of leaving school on functional limitations, incorporating controls for confounders, country- and year-fixed effects. Among men (column 1), a one-point increase in the unemployment rate during the school-leaving year was associated with fewer functional limitations at ages 50-74 (RR=0.63, 95%CI=0.47-0.83). Column 2 shows estimates of a model that incorporates an interaction with educational attainment. Estimates suggest that the association between an increase in unemployment at the year of completing school and the risk of physical limitations for men does not differ significantly by educational attainment.

Table 1 about here

Corresponding estimates for women are presented in columns 3 and 4 of Table 1. A one-point increase in the unemployment rate in the year of completing school was associated with more physical functioning limitations at old age (RR=1.30, 95%CI=1.13-1.50). There was a significant interaction with educational attachment ($p=0.063$), suggesting that an increase in the unemployment rate in the year of completing school was associated with increased number of functional limitations for women with secondary (RR for interaction=1.77, 95%CI=1.35, 2.31) and post-secondary education (RR for interaction=1.56, 95%CI=1.14, 2.13) but not for lower-educated women.

Selection models

To assess if early life factors influenced whether individuals left school in good or poor economic times, Table 2 shows odds ratios of leaving school during a recession (defined as the highest quartile of country-specific unemployment rate deviations) according to childhood characteristics and educational attainment. Men who missed school for at least one month due to illness and women who had an infectious disease during childhood were more likely to have left school during a recession. However, most other associations were not significant, suggesting that individuals that were disadvantaged or less healthy during childhood were no more likely to have left school during a recession than their more advantaged and healthier counterparts.

Table 2 about here

To formally examine the role of selection associated with educational attainment using a Heckman model, results in APPENDIX Table 2 show the coefficients from a probit model with the probability of having (post-)secondary education as outcome. Better health, higher parental occupation, lower deprivation index and better mathematical and language skills all predicted a higher probabilities of having secondary or post-secondary education. Table 3 shows coefficients from models for the association between unemployment-deviations at school-leaving age and functional health in the sample of men and women with secondary or post-secondary education, incorporating the Mills ratio to control for selection into higher education. Estimates are very similar to those presented in Table 1, suggesting that selection into higher education based on measured childhood conditions did not explain results.

Table 3 about here

Mechanisms

Table 4 shows selected results from models examining the association between economic conditions at the time of leaving school with labor market outcomes 10 years later as well as marriage- and fertility-histories.

Among lower-educated men, higher unemployment rates at graduation were associated with higher odds of having had an unemployment gap immediately after leaving school, but lower odds for (post-)secondary educated men. Higher unemployment at graduation was also associated with fewer work-time fluctuations in the 10 years after leaving

school among (post-)secondary educated men. Furthermore, for men with (post-)secondary higher unemployment rates at graduation were associated with lower ages at first childbirth.

Among women with (post-)secondary education, increases in the unemployment rate at graduation were associated with lower age at first childbirth. Thereby, for women with lower education, higher unemployment at graduation were associated with higher ages at first marriage whereas for (post-)secondary educated women it was associated with lower ages.

No significant associations were found for the relationship between unemployment rates at graduation and health behaviors (excessive drinking or current smoking) for either men or women.

Table 4 about here

Despite these associations, APPENDIX Table 3 shows that associations between unemployment rate deviations in the school-leaving year and physical functioning at ages 50-74 remain largely unchanged in models that controls for potential mechanisms such as unemployment-spells or experience of an unemployment-gap immediately after graduation.

Discussion

We found that leaving school during economic contractions was associated with better physical functioning at old age among men, while among women it was associated with worse functional health. Effects among women were primarily concentrated among women of secondary or tertiary education. We found no evidence that selection into higher education explained these associations. Economic conditions at the age of leaving school were associated with several labor market, marriage, fertility and health behavior outcomes, but controlling for these factors did not attenuate associations. While selection remains a possible explanation, findings may indicate that economic conditions during the transition from school to work may trigger both health-preserving and health-damaging mechanisms.

Data assessment and limitations

Some limitations should be considered in our study. A potential limitation is that countries differ significantly in terms of their histories, institutions or other unmeasured characteristics. However, we used country-fixed effects that controlled for cross-country differences in these unobserved variables, so that estimation relied solely on within-country variation across cohorts. Although differences between cohorts within each country may remain, our results were robust to controls for a wide variety of childhood and adult health and socioeconomic indicators.

Participation in SHARE was dependent on survival to middle- or old-age, potentially leading to survival bias. To address this, our models included weights that controlled for

sampling, mortality selection and attrition across waves[32]. Furthermore, when restricting the sample to a younger age-group (50-64) (Appendix Table 4), for which the risk of mortality is relatively small, we obtained similar results to those for ages 50-74. Thus, although mortality selection may play a role, it is unlikely to account fully for our results.

Information on year of graduation and early life variables was self-reported and may be susceptible to recall bias. Nevertheless, studies indicate a level of agreement of around 80-90% between data from life-history event questionnaires and population registries for major life events such as unemployment, health and marriage with relatively small effect on estimates [33, 34].

Appendix Table 4 about here

Interpretation

Our study was motivated by previous research showing that graduating from school during a recession has negative permanent effects on earnings and labor market outcomes [3, 35]. Therefore, we expected cohorts graduating in less favorable times to end up in worse health than those graduating in good economic times. Notwithstanding potential limitations, our results suggest that recessions experienced around graduation may affect later-life outcomes differently for men and women as well as for individuals with different educational level.

Permanent changes in lifestyle as a result of an economic contraction in early adulthood could provide an explanation for the finding that among men, adverse economic conditions around the time of graduation were associated with better functional health at later-life. Such an interpretation would be in agreement with Elder's [9] study of children growing up during the Great Depression showing that children from the most deprived families were characterized by a strong motivation for achievement and early economic independence which altogether contributed to greater job-mobility and few traces of disadvantage in their careers [9]. Other studies have reported temporary reductions in smoking, drinking and body weight [9, 11, 36], paired with rising leisure physical activity during economic contractions. Given that the age around the transition from school to work is a critical period for initiation or cessation of behaviors such as smoking [37-39], recessions around this period may not only have temporary effects, but also delay or prevent initiation of these behaviors altogether [5]. In addition, leaving school during a period of high unemployment may also delay entrance into the labor market [36], reducing the likelihood of entering jobs with hazardous working conditions at young age, particularly for lower-educated men.

On the other hand, findings for women with secondary or post-secondary education are in agreement with previous reports of negative long-run and permanent effects of unfavorable conditions at graduation on life-time income and labor market outcomes, dimensions often associated with health [2, 3, 35]. These studies have observed permanent earning losses particularly for those with higher education, while less-educated workers suffer smaller losses and recover relatively quickly [3]. Previous

research has shown that, as compared to men, women's labor force participation is more influenced by unemployment rate fluctuations [40, 41]. We did not find evidence of differences in labor market outcomes between women leaving school in economic contractions and expansions. However, we found that women with secondary or post-secondary education leaving school in a year of economic contraction had their first marriage earlier than those leaving school during an economic expansion, a potential indication that the former developed a weaker attachment to the labor market.

Economic contractions may have encouraged men with higher socio-economic status to remain longer at school until the economy improved, leading to positive selection into leaving school in good economic times. This mechanism, however, would result in a larger share of better-off individuals leaving school in good economic times and would therefore not explain why this group ended up in worse health than men leaving school in poor economic times. On the other hand, low unemployment rates may have encouraged poorer men to leave school and enter the labor market, which would lead to selection of the less well-off into leaving school in good economic times. Based on a Heckman approach, we found that this selection mechanism did not account for our results. However, we cannot discard that more complex selection mechanisms due to factors unmeasured in our study may account for our results. The fact that the most consistent negative effects of leaving school during contractions was observed for women of post-secondary education, for which selection into further education is likely limited, suggests that results for the less-well educated cohorts may partly reflect selection.

Conclusions

Leaving school during economic contractions was associated with better physical functioning in old age among men but worse physical functioning among women. Results for men may reflect either selection effects or the direct impact of economic conditions on the adoption of behaviors. Among women, poor economic conditions in the year of leaving school may have negatively influenced their income and career prospects, leading to poor health. In 2011, 82% of women aged 25 to 34 in the European Union had secondary or tertiary education [42]. If results for women prove to be causal, recent increases in unemployment may lead to increases in functional limitations decades later among affected cohorts. Policies to prevent these negative effects on women may translate into long-term gains in health.

Acknowledgements

This work was supported by a Starting Researcher Grant from the European Research Council (ERC) [grant no. 263684]. This paper uses data from SHARELIFE release 1, as of November 24th 2010 or SHARE release 2.5.0, as of May 24th 2011. The SHARE data collection has been primarily funded by the European Commission through the 5th framework programme [project QLK6-CT-2001- 00360 in the thematic programme Quality of Life], through the 6th framework programme [projects SHARE-I3, RII-CT-2006-062193, COMPARE, CIT5-CT-2005-028857, and SHARELIFE, CIT4-CT-2006-028812] and through the 7th framework programme [SHARE-PREP, 211909 and SHARE-LEAP, 227822]. Additional funding from the U.S. National Institute on Aging

[U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, Y1-AG-4553-01 and OGHA 04-064, IAG BSR06-11, R21 AG025169] as well as from various national sources is gratefully acknowledged (see www.share-project.org for a full list of funding institutions).

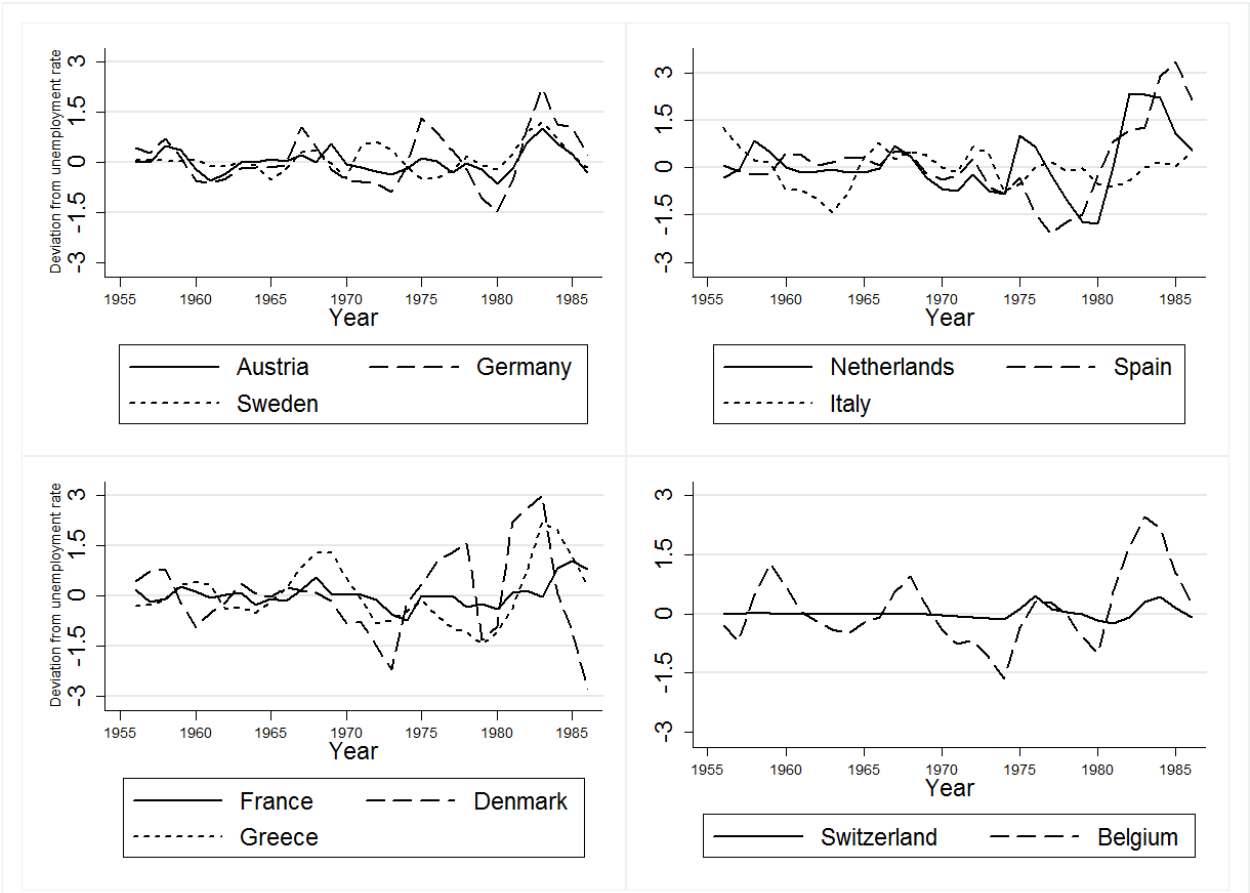
References

1. Eurostat. Unemployment statistics. Luxemburg2012 [2012 Feb 11]; Available from: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Unemployment_statistics.
2. Kahn LB. The long-term labor market consequences of graduating from college in a bad economy. *Labour Economics*. 2010;17(2):303-16.
3. Genda Y, Kondo A, Ohta S. Long-Term Effects of a Recession at Labor Market Entry in Japan and the United States. *J Hum Resour*. 2010 December 21, 2010;45(1):157-96.
4. Oreopoulos P, von Wachter T, Heisz A. Short- and Long-Term Career Effects of Graduating in a Recession. *American Economic Journal: Applied Economics*. 2012; 4(1):1-29.
5. Ruhm CJ. Are recessions good for your health? *Quarterly Journal of Economics*. 2000;115(2):617-50.
6. Stuckler D, Basu S, Suhrcke M, Coutts A, McKee M. The public health effect of economic crises and alternative policy responses in Europe: an empirical analysis. *Lancet*. 2009 Jul 25;374(9686):315-23.
7. Catalano R, Goldman-Mellor S, Saxton K, Margerison-Zilko C, Subbaraman M, LeWinn K, et al. The health effects of economic decline. *Annu Rev Public Health*. 2011 Apr 21;32:431-50.
8. Ruhm CJ. Economic conditions and alcohol problems. *Journal of Health Economics*. 1995 Dec;14(5):583-603.
9. Ruhm CJ. Healthy living in hard times. *J Health Econ*. 2005;24(2):341-63.
10. Gerdtham UG, Ruhm CJ. Deaths rise in good economic times: Evidence from the OECD. *Econ Hum Biol*. 2006 Dec;4(3):298-316.
11. Ruhm CJ, Black WE. Does drinking really decrease in bad times? *J Health Econ*. 2002;21(4):659-78.
12. Van den Berg GJ, Lindeboom M, Portrait F. Economic conditions early in life and individual mortality. *American Economic Review*. 2006;96:290-302.
13. Blossfeld H-P. *Globalization, uncertainty and youth in society*. London, New York: Routledge; 2005.
14. Saar E, Unt M, Kogan I. Transition from Educational System to Labour Market in the European Union. *International Journal of Comparative Sociology*. 2008 February 1, 2008;49(1):31-59.
15. Elder GH. *Children of the great depression : social change in life experience*. 25th anniversary ed. Boulder, Co: Westview Press; 1999.
16. Sullivan D, von Wachter T. Job Displacement and Mortality: An Analysis Using Administrative Data. *The Quarterly Journal of Economics*. 2009 August 1, 2009;124(3):1265-306.
17. Börsch-Supan A, Jürges H. *The Survey of Health, Ageing and Retirement in Europe - Methodology*. Mannheim: Mannheim Research Institute for the Economics of Ageing (MEA)2005.

18. Börsch-Supan A, Schröder M. Retrospective Data Collection in the Survey of Health, Ageing and Retirement in Europe. In: Schröder M, editor. Retrospective Data Collection in the Survey of Health, Ageing and Retirement in Europe. Mannheim: Mannheim Research Institute for the Economics of Ageing (MEA)2011.
19. Börsch-Supan A, Schröder M. Employment and Health at 50+: An Introduction to a Life History Approach to European Welfare State Interventions. In: Börsch-Supan A, et al., editors. The Individual and the Welfare State Life Histories in Europe. Heidelberg: Springer2011.
20. Schröder M. Retrospective Data Collection in the Survey of Health, Ageing and Retirement in Europe. SHARELIFE Methodology. Mannheim: MEA; 2011.
21. Tsae-Jyy W. Concept analysis of functional status. *Int J Nurs Stud.* 2004;41(4):457-62.
22. Katz S, Downs TD, Cash HR, Grotz RC. Progress in Development of the Index of ADL. *The Gerontologist.* 1970 March 20, 1970;10:20-30.
23. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *The Gerontologist.* 1969;9(3):179-86.
24. Nagi SZ. An Epidemiology of Disability among Adults in the United States. *The Milbank Memorial Fund Quarterly Health and Society.* 1976;54(4):439-67.
25. OECD. OECD.Stat. Paris2012 [2012 Feb 11]; Available from: <http://stats.oecd.org>.
26. Hodrick RJ, Prescott EC. Postwar U.S. Business Cycles: An Empirical Investigation. *Journal of Money, Credit and Banking.* 1997;29(1):1-16.
27. van den Berg GJ, Lindeboom M, Lopez M. Inequality in individual mortality and economic conditions earlier in life. *Soc Sci Med.* 2009 Nov;69(9):1360-7.
28. UNESCO. International Standard Classification of Education Paris2012 [updated June 28, 2012]; Available from: <http://www.uis.unesco.org/Education/Pages/international-standard-classification-of-education.aspx>.
29. ILO. International Standard Classification of Occupation. Major, minor and unit groups. 2012 [updated June 28, 2012]; Available from: <http://www.ilo.org/public/english/bureau/stat/isco/isco58/major.htm>.
30. Brzinsky-Fay C. Lost in Transition? Labour Market Entry Sequences of School Leavers in Europe. *European Sociological Review.* 2007 September 1, 2007;23(4):409-22.
31. Heckman JJ. Sample selection bias as a specification error. *Econometrica: Journal of the econometric society.* 1979:153-61.
32. Mannheim Research Institute for the Economics of Ageing. Survey of Health, Ageing and Retirement in Europe: Release Guide 2.5.0 Waves 1 & 2 Mannheim 2011.
33. Blane DB. Collecting retrospective data: development of a reliable method and a pilot study of its use. *Soc Sci Med.* 1996;42(5):751-7.
34. Courgeau D, Lelievre E. Event History Analysis in Demography. Oxford: Clarendon Press; 1992.
35. Oreopoulos P, von Wachter T, Heisz A. Short- and Long-Term Career Effects of Graduating in a Recession. *American Economic Journal: Applied Economics.* In press.

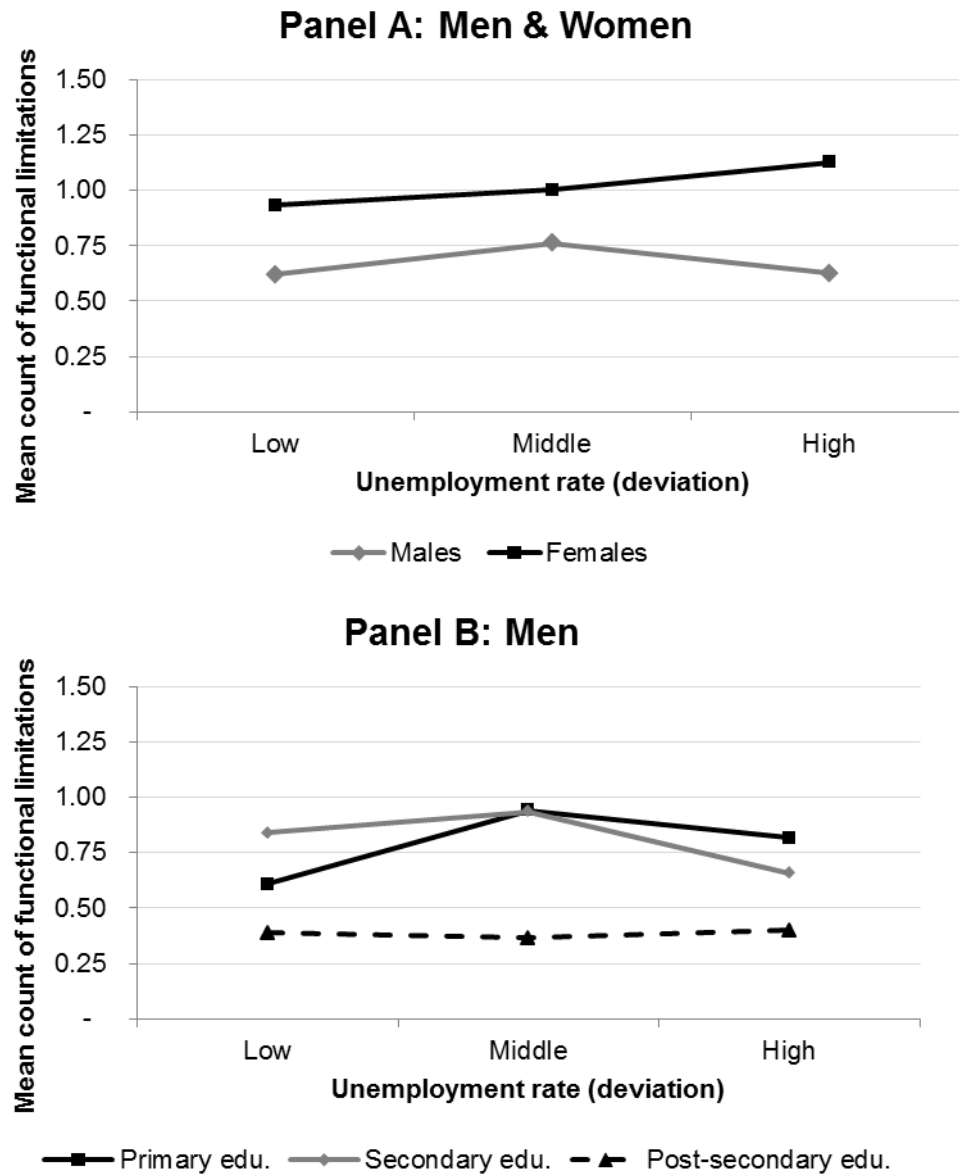
36. Raaum O, Røed K. Do Business Cycle Conditions at the Time of Labor Market Entry Affect Future Employment Prospects? *Rev Econ Stat.* 2006 2006/05/01;88(2):193-210.
37. Johnson RA, Gerstein DR. Initiation of use of alcohol, cigarettes, marijuana, cocaine, and other substances in US birth cohorts since 1919. *Am J Public Health.* 1998 1998/01/01;88(1):27-33.
38. Swan AV, Creeser R, Murray M. When and why children first start to smoke. *Int J Epidemiol.* 1990;19(2):323-30.
39. Zanjani FAK, Schaie KW, Willis SL. Age group and health status effects on health behavior change. *Behav Med.* 2006;32(2):36-46.
40. O'Donnell C. Major Theories of the Labour Market and Women's Place Within It. *Journal of Industrial Relations.* 1984 June 1, 1984;26(2):147-65.
41. Ferber MA, Lowry HM. Sex Differential in Earnings: A Reappraisal. *Ind Labor Relat Rev.* 1975;29:377.
42. Eurostat. Database on education and training. Luxemburg2012 [2012 Apr 25]; Available from: <http://epp.eurostat.ec.europa.eu/portal/page/portal/education/data/database>.

Figure 1. Deviations from the unemployment rate in 11 European countries (1956 to 1986)^a

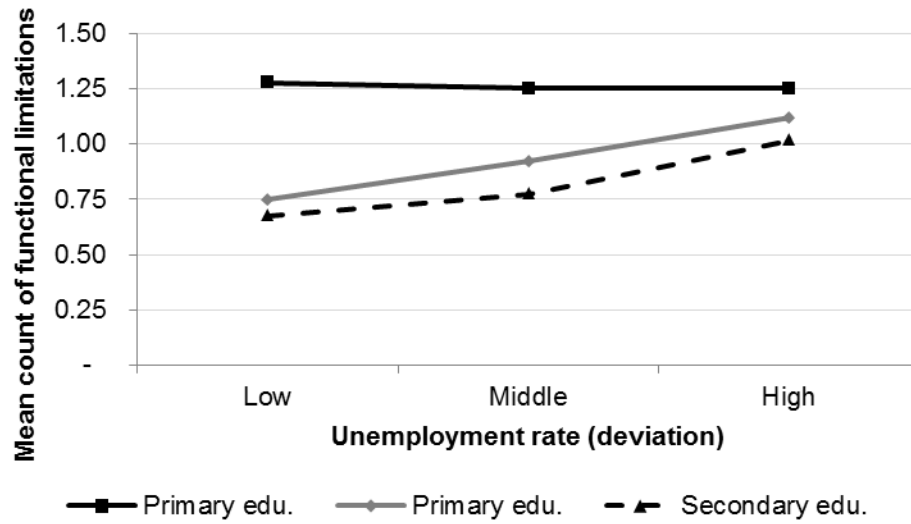


^a The figures show the deviations from the unemployment rate (% of civilian labor force) obtained with the Hodrick-Prescott filter.

Figure 2. Unemployment-deviations at time of leaving school and functional limitations at older age of men and women from 11 European countries, 2004-2007^a



Panel C: Women



^a The lines show the relationship between the deviations in the unemployment rate (in terms of country-specific tertiles) at time of graduation and the predicted mean number of functional limitations. Means are adjusted by sex, year of birth and countries.

Table 1. Rate ratio: The association between unemployment rates at the time of completing full-time education and functional limitations in men and women from 11 European countries at ages 50-74^a

| | Men | | | | Women | | | |
|--|------|-------------|------|-------------|-------|-------------|------|-------------|
| | RR | 95% CI | RR | 95% CI | RR | 95% CI | RR | 95% CI |
| Unemployment rate (deviation) | 0.63 | (0.47-0.83) | 0.92 | (0.49-1.71) | 1.30 | (1.13-1.50) | 0.89 | (0.77-1.03) |
| Year of birth | 1.01 | (0.97-1.06) | 1.01 | (0.97-1.06) | 1.02 | (0.98-1.06) | 1.02 | (0.98-1.06) |
| Childhood conditions | | | | | | | | |
| Poor self-rated health | 1.86 | (1.50-2.29) | 1.85 | (1.51-2.27) | 1.78 | (1.47-2.17) | 1.78 | (1.48-2.15) |
| Mental condition diagnosis | 1.23 | (0.80-1.91) | 1.24 | (0.80-1.91) | 1.87 | (1.36-2.58) | 1.88 | (1.36-2.59) |
| Physical condition diagnosis | 1.36 | (1.07-1.72) | 1.36 | (1.07-1.73) | 1.13 | (0.99-1.30) | 1.14 | (0.99-1.31) |
| Infectious disease | 0.73 | (0.55-0.96) | 0.73 | (0.56-0.96) | 0.84 | (0.69-1.03) | 0.84 | (0.70-1.02) |
| Missed school for > 1 month | 0.72 | (0.58-0.89) | 0.72 | (0.58-0.89) | 1.00 | (0.80-1.24) | 0.99 | (0.80-1.24) |
| Lost parent before age 16 | 1.68 | (0.88-3.20) | 1.67 | (0.87-3.23) | 1.71 | (1.02-2.87) | 1.67 | (1.02-2.73) |
| Comfort of childhood home index | 0.90 | (0.86-0.93) | 0.90 | (0.86-0.93) | 0.98 | (0.94-1.02) | 0.98 | (0.94-1.03) |
| ISCO main breadwinner | | | | | | | | |
| Low skilled blue collar | | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| High skilled blue collar | 0.89 | (0.71-1.13) | 0.88 | (0.70-1.11) | 0.85 | (0.77-0.95) | 0.86 | (0.78-0.96) |
| Low skilled white collar | 1.10 | (0.78-1.57) | 1.09 | (0.77-1.54) | 0.87 | (0.62-1.22) | 0.88 | (0.63-1.22) |
| High skilled white collar | 0.91 | (0.62-1.34) | 0.91 | (0.62-1.34) | 1.14 | (0.87-1.50) | 1.15 | (0.87-1.52) |
| Number of books when ten | | | | | | | | |
| None or very few (0-10 books) | | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Enough to fill one shelf (11-25 books) | 0.85 | (0.71-1.01) | 0.85 | (0.71-1.02) | 0.97 | (0.80-1.18) | 0.98 | (0.81-1.20) |
| Enough to fill one bookcase (26-100 books) | 1.02 | (0.87-1.20) | 1.02 | (0.87-1.20) | 0.94 | (0.79-1.12) | 0.94 | (0.79-1.11) |
| Enough to fill two bookcases (101-200 books) | 1.13 | (0.77-1.65) | 1.13 | (0.78-1.64) | 1.00 | (0.91-1.11) | 1.00 | (0.90-1.11) |
| Enough to fill two or more bookcases (more than 200 books) | 0.88 | (0.53-1.45) | 0.87 | (0.53-1.44) | 0.97 | (0.84-1.12) | 0.98 | (0.85-1.12) |
| Education | | | | | | | | |
| Primary | | | | | | | | |
| Secondary | 1.07 | (0.83-1.38) | 1.06 | (0.83-1.36) | 0.87 | (0.68-1.13) | 0.87 | (0.67-1.14) |
| Post-secondary | 0.72 | (0.58-0.89) | 0.71 | (0.57-0.88) | 0.88 | (0.78-1.00) | 0.88 | (0.78-1.00) |

| | | | | |
|---|------|-------------|------|-------------|
| Unemployment deviation*secondary education | 0.62 | (0.31-1.24) | 1.77 | (1.35-2.31) |
| Unemployment deviation*post-secondary education | 0.66 | (0.25-1.74) | 1.56 | (1.14-2.13) |

Abbreviations: RR, rate ratio; ISCO, International Standard Classification of Occupations; CI, 95% confidence interval of double-sided test.

^a All models include also fixed effects for country, year of completing full-time education and year of first interview

Table 2. Logistic regression: Association between childhood socio-economic status as well as health and the likelihood of graduating during a recession for men and women graduating between 1956 and 1986 in 11 European countries^a

| | Men | | Women | |
|--|------|-------------|-------|-------------|
| | OR | 95% CI | OR | 95% CI |
| Year of birth | 0.98 | (0.96-1.01) | 0.97 | (0.94-1.01) |
| Poor self-rated health | 0.82 | (0.56-1.20) | 1.12 | (0.75-1.66) |
| Mental condition diagnosis | 1.36 | (0.67-2.78) | 1.17 | (0.66-2.05) |
| Physical condition diagnosis | 1.09 | (0.94-1.26) | 0.86 | (0.66-1.12) |
| Infectious disease | 1.03 | (0.77-1.39) | 1.52 | (0.99-2.34) |
| Missed school 1 month+ | 1.71 | (1.27-2.29) | 1.19 | (0.85-1.66) |
| Parent died before age 16 | 1.72 | (0.64-4.60) | 1.73 | (0.38-7.76) |
| Comfort of childhood home index 2 | 1.01 | (0.98-1.04) | 0.99 | (0.93-1.05) |
| ISCO main breadwinner | | | | |
| Low skilled blue collar | | 1 | | 1 |
| High skilled blue collar | 0.93 | (0.69-1.26) | 0.94 | (0.75-1.18) |
| Low skilled white collar | 0.91 | (0.47-1.75) | 1.00 | (0.66-1.52) |
| High skilled white collar | 1.20 | (0.71-2.03) | 0.80 | (0.52-1.25) |
| Number of books when ten | | | | |
| None or very few (0-10 books) | | 1 | | 1 |
| Enough to fill one shelf (11-25 books) | 1.09 | (0.93-1.29) | 0.95 | (0.74-1.22) |
| Enough to fill one bookcase (26-100 books) | 1.22 | (0.90-1.65) | 1.12 | (0.85-1.47) |
| Enough to fill two bookcases (101-200 books) | 0.69 | (0.52-0.92) | 0.93 | (0.62-1.40) |
| Enough to fill two or more bookcases (more than 200 books) | 0.95 | (0.64-1.42) | 1.10 | (0.86-1.40) |
| Education | | | | |
| Primary | | 1 | | 1 |
| Secondary | 0.80 | (0.58-1.11) | 1.27 | (0.99-1.62) |
| Post-secondary | 0.78 | (0.51-1.19) | 1.01 | (0.69-1.46) |

Abbreviations: OR, odds ratio; CI, 95% confidence interval of double-sided test.

^a The Table shows the odds ratios of leaving school during a recession, defined as the highest quartile of country-specific unemployment rate deviations according to childhood characteristics and educational attainment. All models include also fixed effects for country, year of completing full-time education and year of first interview

Table 3. Selection model: The association between unemployment rates at the time of completing full-time education and functional limitations in men and women from 11 European countries at ages 50-74^a

| | Men | | Women | |
|--|------|-------------|-------|-------------|
| | RR | 95% CI | RR | 95% CI |
| Unemployment rate (deviation) | 0.56 | (0.39-0.81) | 1.77 | (1.31-2.40) |
| Year of birth | 1.03 | (0.99-1.07) | 0.99 | (0.97-1.02) |
| Poor self-rated health | 2.05 | (1.51-2.79) | 1.60 | (1.23-2.09) |
| Mental condition diagnosis | 0.90 | (0.65-1.24) | 1.87 | (1.18-2.96) |
| Physical condition diagnosis | 1.31 | (1.04-1.65) | 1.21 | (1.02-1.43) |
| Infectious disease | 0.69 | (0.56-0.86) | 0.75 | (0.58-0.97) |
| Missed school for > 1 month | 0.72 | (0.60-0.87) | 1.02 | (0.85-1.23) |
| Lost parent before age 16 | 1.99 | (1.20-3.32) | 0.94 | (0.31-2.88) |
| Comfort of childhood home index | 0.90 | (0.85-0.94) | 0.98 | (0.91-1.06) |
| ISCO main breadwinner | | | | |
| Low skilled blue collar | | 1 | | 1 |
| High skilled blue collar | 0.86 | (0.68-1.09) | 0.96 | (0.84-1.08) |
| Low skilled white collar | 0.95 | (0.72-1.26) | 0.82 | (0.64-1.07) |
| High skilled white collar | 0.83 | (0.55-1.25) | 1.10 | (0.82-1.50) |
| Number of books when ten | | | | |
| None or very few (0-10 books) | | 1 | | 1 |
| Enough to fill one shelf (11-25 books) | 0.90 | (0.76-1.06) | 0.95 | (0.84-1.08) |
| Enough to fill one bookcase (26-100 books) | 1.08 | (0.92-1.27) | 0.98 | (0.67-1.43) |
| Enough to fill two bookcases (101-200 books) | 1.15 | (0.81-1.62) | 1.05 | (0.88-1.26) |
| Enough to fill two or more bookcases (more than 200 books) | 0.81 | (0.55-1.20) | 0.98 | (0.72-1.32) |
| Education | | | | |
| Secondary | | 1 | | 1 |
| Post-secondary | 0.70 | (0.58-0.85) | 0.96 | (0.81-1.14) |
| Inverse Mills ratio | 0.81 | (0.38-1.75) | 1.20 | (0.55-2.61) |

Abbreviations: RR, rate ratio; CI, 95% confidence interval of double-sided test.

^a The models only include the sample of (post-)secondary educated men and women respectively. Both models thereby control for the inverse Mills ratio obtained from a probit model which regressed the likelihood of having (post-)secondary education on the full set of childhood-characteristic as well as self-rated language and mathematical skills at age ten (see APPENDIX Table 2). All models include fixed effects for country, year of completing full-time education and year of first interview.

Table 4. Associations between unemployment rates at graduation and labour market outcomes as well as marital- and childbirth-histories^a

| | | Men | | | Women | | |
|---|---|---------------|------------|------------|---------------|------------|------------|
| | | OR | LCI | UCI | OR | LCI | UCI |
| Non-employed (yes) | Primary vs. (post-)secondary education | 1.53 | 1.13 | 2.09 | 0.81 | 0.57 | 1.15 |
| | Unemployment deviation (primary education) | 1.03 | 0.47 | 2.25 | 0.88 | 0.48 | 1.64 |
| | Unemployment deviation*(post-)secondary education | 0.63 | 0.27 | 1.45 | 1.50 | 0.96 | 2.32 |
| Laid-off/plant-closures (yes) | Primary vs. (post-)secondary education | 0.78 | 0.52 | 1.16 | 0.86 | 0.46 | 1.59 |
| | Unemployment deviation (primary education) | 0.62 | 0.30 | 1.27 | 1.28 | 0.45 | 3.63 |
| | Unemployment deviation*(post-)secondary education | 0.62 | 0.30 | 1.30 | 0.89 | 0.29 | 2.69 |
| Work fluctuations (yes) | Primary vs. (post-)secondary education | 0.72 | 0.39 | 1.33 | 0.69 | 0.29 | 1.65 |
| | Unemployment deviation (primary education) | 1.21 | 0.61 | 2.40 | 0.75 | 0.12 | 4.55 |
| | Unemployment deviation*(post-)secondary education | 0.41 | 0.17 | 0.96 | 1.28 | 0.09 | 18.50 |
| Working part-time (yes) | Primary vs. (post-)secondary education | 0.68 | 0.46 | 1.00 | 0.86 | 0.56 | 1.33 |
| | Unemployment deviation (primary education) | 0.74 | 0.38 | 1.47 | 1.21 | 0.91 | 1.62 |
| | Unemployment deviation*(post-)secondary education | 1.14 | 0.40 | 3.25 | 0.92 | 0.65 | 1.30 |
| Unemployment gap after graduation (yes) | Primary vs. (post-)secondary education | 0.95 | 0.67 | 1.34 | 0.69 | 0.29 | 1.65 |
| | Unemployment deviation (primary education) | 3.91 | 1.44 | 10.62 | 0.75 | 0.12 | 4.55 |
| | Unemployment deviation*(post-)secondary education | 0.16 | 0.04 | 0.67 | 1.28 | 0.09 | 18.50 |
| | | <u>Coeff.</u> | <u>LCI</u> | <u>UCI</u> | <u>Coeff.</u> | <u>LCI</u> | <u>UCI</u> |
| Age at first marriage | Primary vs. (post-)secondary education | -0.11 | -0.41 | 0.19 | 0.12 | -0.30 | 0.55 |
| | Unemployment deviation (primary education) | 0.36 | -0.38 | 1.10 | 1.03 | 0.41 | 1.66 |
| | Unemployment deviation*(post-)secondary education | -0.57 | -1.49 | 0.35 | -1.68 | -2.80 | -0.55 |
| Age at first child | Primary vs. (post-)secondary education | -0.13 | -0.51 | 0.25 | 0.12 | -0.07 | 0.30 |
| | Unemployment deviation (primary education) | 0.83 | -0.10 | 1.75 | 0.33 | -0.70 | 1.36 |
| | Unemployment deviation*(post-)secondary education | -1.44 | -2.43 | -0.45 | -0.05 | -1.40 | 1.30 |

Abbreviations: RR, rate ratio; Coeff., regression coefficient; LCI, 95% lower confidence interval; UCI, 95% upper confidence interval.

^a The Table shows the rate ratios and regression coefficients of separate regressions with various labour market outcomes or marital- and childbirth-histories as outcomes and the unemployment rate at graduation as well as interaction with primary vs. (post-)secondary education as main predictors. All models include the same control variables as in Table 1 as well as fixed effects for country, year of completing full-time education and year of first interview.

APPENDIX Table 1. Sample characteristics^a

| | n | % | | n (mean) | % (SD) |
|--|-------|-------|--|----------|--------|
| N=10,338 | | | | | |
| Unemployment rate | | | Index of limitations (ADL + IADL + Mobility) | | |
| 0 to <1 % | 2,168 | 20.97 | No limitations | 6,791 | 65.55 |
| 1 to <2 % | 3,403 | 32.92 | 1 limitation | 1,467 | 14.38 |
| 2 to <3 % | 1,934 | 18.71 | 2 limitations | 807 | 7.50 |
| 3 to <4 % | 613 | 5.93 | 2+ limitations | 1,309 | 12.56 |
| 4 to <5 % | 633 | 6.12 | Childhood self-rated health | | |
| 5 to <6 % | 1,036 | 10.02 | Excellent, very good or good | 9,316 | 91.97 |
| ≥6 % | 551 | 5.33 | Fair or poor | 1,022 | 8.03 |
| Year of birth | | | Mental condition as child (yes) | 187 | 1.83 |
| 1934-38 | 407 | 3.94 | Physical condition as child (yes) | 3,230 | 31.25 |
| 1939-43 | 1,949 | 18.85 | Missed school for > 1 month (yes) | 1,105 | 10.69 |
| 1944-48 | 2,740 | 26.50 | Lost parent before age 16 (yes) | 36 | 0.35 |
| 1949-53 | 3,346 | 32.36 | Infectious condition as child (yes) | 8,942 | 86.50 |
| 1954-59 | 1,897 | 18.35 | Country | | |
| Year of graduation | | | Austria | 350 | 3.39 |
| 1956-65 | 4,538 | 43.90 | Belgium | 444 | 4.29 |
| 1966-75 | 5,170 | 50.01 | Denmark | 250 | 2.42 |
| 1976-86 | 630 | 6.09 | France | 2,044 | 19.77 |
| Age at graduation | | | Germany | 3,261 | 31.54 |
| 14-16 | 3,190 | 30.86 | Greece | 331 | 3.20 |
| 17-19 | 3,981 | 38.51 | Italy | 1,477 | 14.28 |
| 20-22 | 1,822 | 17.63 | Netherlands | 627 | 6.07 |
| 23-25 | 1,024 | 9.91 | Spain | 912 | 8.82 |
| 25-27 | 321 | 3.10 | Sweden | 314 | 3.03 |
| Female | 5,379 | 53.52 | Switzerland | 328 | 3.18 |
| Education (ISCED-categories) | | | Employment trajectories | | |
| Primary edu. or 1st stage of basic edu. | 949 | 9.18 | Non-employed (yes) | 5,477 | 52.98 |
| Lower secondary or 2nd stage of basic edu. | 1,748 | 16.91 | Laid-off/plant-closures (yes) | 968 | 9.36 |
| (Upper) secondary edu. | 4,538 | 43.90 | Work fluctuations (yes) | 1,233 | 11.93 |
| Post-secondary non-tertiary edu. | 338 | 3.27 | Working part-time (yes) | 1,676 | 16.21 |
| First stage of tertiary edu. | 2,765 | 26.74 | Unemployment gap after graduation (yes) | 441 | 4.27 |
| Comfort of childhood home index | | | Health behaviors | | |
| 0 | 996 | 9.63 | Heavy drinking (yes) | 1066 | 10.31 |
| 1 | 1,816 | 17.57 | Current smoker (yes) | 2593 | 25.08 |
| 2 | 1,887 | 18.25 | Age at first child | (26.41) | (4.92) |
| 3 | 1,697 | 16.42 | Age at first marriage | (24.27) | (4.78) |
| 4 | 1,539 | 14.89 | | | |
| ≥5 | 2,403 | 23.24 | | | |

Abbreviations: ADL, Activities of Daily Living; IADL, Instrumental Activities of Daily Living; ISCED, International Standard Classification of Education; SD, standard deviation.

^a Calculations based on data from SHARELIFE rel. 1 and SHARE rel. 2.5.0; results are unweighted.

APPENDIX Table 2. Probit model: Association between childhood-characteristics and likelihood of obtaining (post-)secondary education for men and women graduating between 1956 and 1986^a

| | Men | | Women | |
|--|-------|---------------|-------|---------------|
| | Coeff | 95% CI | Coeff | 95% CI |
| Year of birth | -0.26 | (-0.33,-0.20) | -0.35 | (-0.43,-0.28) |
| Poor self-rated health | 0.32 | (-0.06,0.69) | -0.08 | (-0.38,0.22) |
| Mental condition diagnosis | -0.45 | (-0.99,0.08) | 0.37 | (-0.24,0.99) |
| Physical condition diagnosis | -0.00 | (-0.10,0.10) | 0.09 | (-0.01,0.19) |
| Infectious disease | -0.16 | (-0.32,-0.00) | -0.15 | (-0.31,0.01) |
| Missed school for > 1 month | 0.03 | (-0.16,0.21) | 0.09 | (-0.08,0.25) |
| Lost parent before age 16 | -0.00 | (-0.82,0.82) | 0.21 | (-0.59,1.01) |
| Comfort of childhood home index | 0.05 | (0.01,0.09) | 0.06 | (0.03,0.10) |
| ISCO main breadwinner | | | | |
| Low skilled blue collar | | 1 | 1 | |
| High skilled blue collar | 0.05 | (-0.06,0.17) | 0.05 | (-0.09,0.20) |
| Low skilled white collar | 0.43 | (0.22,0.64) | 0.12 | (-0.08,0.32) |
| High skilled white collar | 0.41 | (0.22,0.60) | 0.18 | (-0.00,0.37) |
| Number of books when ten | | | | |
| None or very few (0-10 books) | | 1 | 1 | |
| Enough to fill one shelf (11-25 books) | 0.22 | (0.05,0.39) | 0.30 | (0.04,0.55) |
| Enough to fill one bookcase (26-100 books) | 0.25 | (-0.03,0.53) | 0.28 | (0.02,0.53) |
| Enough to fill two bookcases (101-200 books) | 0.23 | (-0.01,0.47) | 0.56 | (0.14,0.98) |
| Enough to fill two or more bookcases (more than 200 books) | 0.45 | (0.21,0.70) | 0.30 | (0.05,0.55) |
| Relative position to others mathematically | | | | |
| Much better | | 1 | 1 | |
| Better | -0.20 | (-0.38,-0.01) | -0.09 | (-0.60,0.42) |
| About the same | -0.22 | (-0.49,0.05) | -0.17 | (-0.76,0.41) |
| Worse | -0.43 | (-0.70,-0.16) | -0.38 | (-0.93,0.17) |
| Much worse | -0.97 | (-1.67,-0.28) | -0.62 | (-1.07,-0.17) |
| Relative position to others language | | | | |
| Much better | | 1 | 1 | |
| Better | -0.12 | (-0.37,0.13) | 0.03 | (-0.09,0.16) |
| About the same | -0.10 | (-0.28,0.09) | -0.15 | (-0.34,0.04) |
| Worse | -0.19 | (-0.51,0.12) | -0.21 | (-0.73,0.32) |
| Much worse | -0.51 | (-1.05,0.04) | -0.46 | (-0.94,0.01) |
| Pseudo R-squared | | 0.42 | | 0.41 |

Abbreviations: Coeff., coefficient; CI, 95% confidence interval of double-sided test.

^a The Table shows the coefficients from a probit model regressing the likelihood of having (posts)secondary education vs. only primary education on various childhood-characteristics. All models include also fixed effects for country, year of completing full-time education and year of first interview.

APPENDIX Table 3. Rate ratio: The association between of unemployment rates at the time of completing full-time education and functional limitations in men and women from 19 European countries at ages 50-74 (including controls for experience of non-employment or unemployment gap after graduation)
~~**APPENDIX Table 4.** Rate ratio: The association between unemployment rates at the time of completing full-time education and functional limitations in men and women from 19 European countries at ages 50-74 (including controls for experience of non-employment or unemployment gap after graduation)~~
APPENDIX Table 4. Rate ratio: The association between unemployment rates at the time of completing full-time education and functional limitations in men and women from 19 European countries at ages 50-64^a

APPENDIX Table 3.1 Unemployment gap after graduation (yes)

| | Men | | | | Women | | | |
|---|------|-------------|------|-------------|-------|-------------|------|-------------|
| | RR | 95% CI | RR | 95% CI | RR | 95% CI | RR | 95% CI |
| Unemployment rate (deviation) | 0.63 | (0.49-0.80) | 0.66 | (0.54-0.81) | 1.21 | (1.02-1.44) | 0.80 | (0.70-0.92) |
| Unemployment deviation*secondary education | | | 0.84 | (0.58-1.22) | | | 1.89 | (1.44-2.48) |
| Unemployment deviation*post-secondary education | | | 1.16 | (0.83-1.62) | | | 1.60 | (1.26-2.02) |
| Unemployment gap after graduation | 1.10 | (0.84-1.45) | 1.10 | (0.84-1.43) | 1.30 | (1.04-1.63) | 1.29 | (1.01-1.64) |

APPENDIX Table 3.2 Non-employed (>=1 year) in 10 years after graduation (yes)

| | Men | | | | Women | | | |
|--|------|-------------|------|-------------|-------|-------------|------|-------------|
| | RR | 95% CI | RR | 95% CI | RR | 95% CI | RR | 95% CI |
| Unemployment rate (deviation) | 0.63 | (0.47-0.84) | 0.92 | (0.49-1.73) | 1.28 | (1.12-1.47) | 0.90 | (0.78-1.03) |
| Unemployment deviation*secondary education | | | 0.62 | (0.31-1.24) | | | 1.72 | (1.32-2.24) |
| Unemployment deviation*post-secondary education | | | 0.66 | (0.25-1.75) | | | 1.51 | (1.11-2.06) |
| Non-employed (>=1 year) in 10 years after graduation | 1.03 | (0.93-1.13) | 1.03 | (0.93-1.13) | 1.32 | (1.20-1.46) | 1.32 | (1.19-1.46) |

Abbreviations: RR, rate ratio; CI, 95% confidence interval of double-sided test.

^a All models include the same covariates as shown in Table 1 and also fixed effects for country, year of completing full-time education and year of first interview but results are not shown.

| | Men | | | | Women | | | |
|---|------|-------------|------|-------------|-------|-------------|------|-------------|
| | RR | 95% CI | RR | 95% CI | RR | 95% CI | RR | 95% CI |
| Unemployment rate (deviation) | 0.61 | (0.49-0.76) | 0.73 | (0.42-1.27) | 1.30 | (1.12-1.51) | 0.76 | (0.45-1.28) |
| Unemployment deviation*secondary education | | | 0.73 | (0.38-1.41) | | | 2.09 | (0.89-4.92) |
| Unemployment deviation*post-secondary education | | | 1.00 | (0.42-2.35) | | | 2.02 | (1.47-2.77) |

Abbreviations: RR, rate ratio; CI, 95% confidence interval of double-sided test.

^a All models include the same covariates as shown in Table 1 and also fixed effects for country, year of completing full-time education and year of first interview but results are not shown.