Title: Labor Market Exit, Work Stress and Education: A Study with older Employees in 16 European Countries

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Introduction

Background. The current demographic changes require policies that seek to extend working lives, for example, by increasing statutory pension ages and closing early retirement pathways. In the near future, the statutory pension age will be 65 years in half of the OECD countries, and in 14 countries it will be between 67 and 69 years (1). Yet, the actual retirement age is below the statutory one in most European countries, with a gap ranging from 4 years in Italy to under one year in Sweden in 2016 (2). This highlights the importance of understanding the risk factors that contribute to early work exit.

Research questions. This study analyzes the association between work stress and work exit in 16 European countries. Furthermore, it investigates if there is a social gradient in work exit, and whether this gradient varies across the different welfare regimes.

Theoretical framework. The individual's exposure to the work environment, specifically stress, is one of the most relevant determinants in the decision-making process on retirement (3–6). Two theoretical models have received much attention: The *demand-control model* (7), also known as job strain model, identifies stressful work in terms of high demands in combination with low control. Different studies showed that the control dimension is more important than occupational demands for retirement intensions and disability retirement (8,9). The *effort-reward-imbalance model* (ERI) (10) claims that an imbalance between high efforts and low rewards impairs health and accelerates retirement decisions. Rewards can be financial, e.g. promotion prospects including job security, or emotional through recognition and appreciation (11). The two models complement each other, with the first one focusing on work contents, and the second highlighting violations of reciprocity exchanges. Both models predict higher risks of several work exit outcomes, e.g. retirement intensions, early retirement, disability pension, as well as early work exit (12–15).

Furthermore, the influence of work stress on work exit likely varies between individuals from different educational levels. Lower educated workers experience more work stress and report earlier retirement intensions (16,17). They also often have less influence over their effort, and

in turn a lower motivation to stay in work, compared to higher educated employees with more challenging work and a higher influence level (18). However, the lower educated typically have fewer financial resources to retire early (19).

This social gradient in work exit may be reduced in countries that offer a generous retirement scheme, for instance, through allowing earlier retirement without or only with small deductions. Welfare states providing incentives for early work exit and favorable pre-retirement arrangements arguably have a *pull* effect on early work exit (20). In contrast, *push* factors can be seen as labor market constraints that drive older workers out of employment, e.g. mass unemployment or economic restructuring. Such contexts should further increase the social gradient in work exit (19,20).

Methods

Data & Sample. The associations between work stress and work exit were investigated with the longitudinal Survey of Health, Aging and Retirement in Europe (SHARE). The survey collected data of participants aged 50+ using computer-assisted personal interviews (21). Starting with the first wave in 2004 and 2005 in 11 European countries and Israel, follow-ups were conducted biennially until 2015. By now, 21 countries participating and sampling strategies varied by country. The analytical sample includes 16 countries[1], which at least participated at two time points. Respondents were aged between 50 and 68 and had to be in paid work during the first observation. The sample consisted of 8,425 respondents. Country-specific case numbers range from *n*=225 in Poland to *n*=1,912 in Switzerland.

Dependent variable: work exit. A work exit occurred if a respondent retired or became (and stayed) unemployed, disabled or homemaker.

Independent variable: work stress. Work stress was measured by shortened versions of the original scales of the demand-control model (22) and effort-reward-imbalance model (23). The index ranges from 2-8 and a higher score indicates lower job control.

The ERI is defined by the ratio of the sum score of effort items (nominator) divided by the sum score of reward (denominator) adjusted for the number of items (24). A higher score refers to an effort-reward-imbalance.

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[1] Austria, Germany, Sweden, The Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland, Belgium, Israel, Czech Republic, Poland, Slovenia and Estonia

Moderator: education. Education was measured with the International Standard Classification of Education (ISCED-97). Using ISCED-97 respondents were either low educated (ISCED 1,2), medium educated (ISCED 3,4) or high educated (ISCED 5,6).

Control variables. Analyses were controlled for respondents' sex, marital status (married, never marries, divorced, widowed), self-rated health status (1 excellent – 5 poor), having difficulty to make ends meet (yes/no), and taking care of grandchildren (yes/no).

Statistical analysis. Analyses will be carried out in two steps: First, for analyzing the association between work stress and work exit on the individual level, Cox regressions will be estimated for each country separately. Furthermore, the analysis will be stratified by education. Next, macro-level indicators will be added, e.g. GDP per capita and employment rates. As a multilevel design is not possible due to the limited number of countries, a meta-analysis will be conducted to model differences between countries in a final step. The preliminary results are based on a Cox regression with country dummies without macro level indicators.

Results

The mean age at work exit is 60.4 years, whereby more than one fifth experienced a work exit. 22% of the respondents had a low education, 44% medium and 34% high education. The results of the Cox regression showed (Table 1) that low job control and ERI reduce the risk of early work exit. Poor self-rated health, being low educated and having difficulty to make ends meet postpone work exit. Austrians have a higher risk of early work exit compared to Germans. In contrast, Swedes exit work later than Germans.

*Table 1: Cos regression results on age to work exit.*

	Hazard Ratio	Std.Err.
Self-rated health	1.132[***]	(0.03)
Low Education	1.166[*]	(0.08)
Medium Education	1.089	(0.06)
High Education	1	(.)
Job control	0.942[***]	(0.02)
ERI	0.754[***]	(0.04)
Female	1.019	(0.05)
Problems to make ends meet	1.395[***]	(0.08)
Married	1	(.)
Never married	1.029	(0.08)
Divorced	0.801[***]	(0.05)
Widowed	0.807[*]	(0.08)
Taking care of grandchildren	0.992	(0.05)
Austria	3.626[***]	(0.45)

Germany	1	(.)
Sweden	0.560***	(0.07)
Netherlands	1.228	(0.15)
Spain	1.259	(0.16)
Italy	0.995	(0.13)
France	2.206***	(0.25)
Denmark	0.806	(0.09)
Greece	1.224	(0.21)
Switzerland	1.252*	(0.14)
Belgium	1.938***	(0.21)
Israel	0.787	(0.11)
Czech Republic	2.313***	(0.29)
Poland	1.005	(0.28)
Slovenia	3.569***	(0.70)
Estonia	1.137	(0.15)
Observations	10,310	

Note. Exponentiated coefficients; Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Stratifying the analysis by education showed that country differences exist even after controlling for individual characteristics (Figure 1). High and medium educated respondents exited work significantly earlier than in Germany (=reference category).

Figure 1: Coefficients on work exit, stratified by education (controlled for individual characteristics). Reference category: Germany.
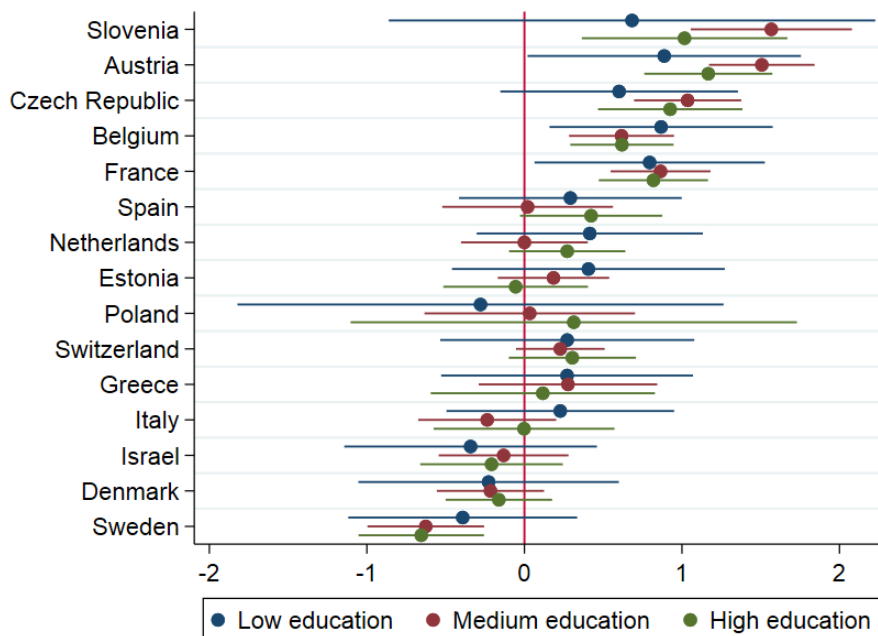
Results suggest that there is a social gradient in work exit between countries, which cannot be explained by individual characteristics alone. Further analysis with macro-level indicators are needed to explain differences between countries.

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