Gender Differences in the Effect of Education on Depression in Later Life

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Extended Abstract (Note: this is very rough at the moment)

Introduction

A long research tradition argues that education has protective effects regarding mental health. But does education has the same effects on everybody? Do men and women equally benefit from education? Or does the effect of education depend on the cultural context we live in?

In order to explore these questions I follow an approach of Ross and Mirowsky (2006), who argue that gender differences in the effect of education on depression exist by testing two different theories: *resource multiplication* and *resource substitution*. Resource substitution theory argues that education is more beneficial to women than to men. The central assumption of this theory is that the absence of one resource is less harmful if other resources can substitute it. Since women usually report a lack of certain resources like earnings and authority education is an even more important resource for them.

In contrast, resource multiplication hypothesizes greater emotional benefit from education for men. The absence of resources is harmful since resources multiply each other. Therefore the absence of one resource reduces the value of other resources. This implies that advantaged groups gain more whereas disadvantaged groups experience smaller gains from the same resource. Since men usually report higher labor market payoffs, higher earnings and more authority and power, education should enhance men's mental well-being more than that of women.

The Ross and Mirowsky study found support for the resource substitution theory by using a US American sample. My contribution to the existing literature is threefold: first, I will repeat the analyses of Ross and Mirowsky by using a representative European dataset. Second, I will exploit the broad cultural variety within Europe in order to test whether the gender difference in the effect of education on depression depends on the cultural contexts. Third, I will put emphasis on the population 50plus in order to explore whether possible gender differences in the education effect persist into retirement age and beyond.

Data and Methods

In order to test the hypotheses I use a pooled sample of the 2004 and 2006 waves of the "Survey of Health, Ageing and Retirement in Europe" (SHARE; for an overview see (Boersch-Supan and Juerges 2005). SHARE contains interviews with more than 43,000 respondents aged 50 years and older in 14 European countries and Israel. SHARE is modeled closely after the U.S. 'Health and Retirement Study' and it is the first data set to combine extensive cross-national information on socio-economic status, health, and family relationships of Europe's elder population. Probability samples were drawn in each participating country. However, the institutional conditions with respect to sampling in the participating countries are so different that a uniform sampling design for the entire project was infeasible. As a result the sampling designs used vary from a simple random selection of households (in the Danish case, for example, from the country's central population register) to rather complicated multi-stage designs (as, for example, in Greece, where the telephone directory was used as a sampling frame). The weighted average household response rate in the face-to-face part of the survey is 62% (a thorough description of methodological issues is contained in (Boersch-Supan and Juerges 2005)). The overall attrition rate in wave 2 is 27,93%. The pooled sample used in the analyses contains the data of 35,854 respondents.

The primary outcome variable in all analyses is respondents' state of mental health, measured by the number of depressive symptoms. This variable is operationalized using the EURO-D scale (Prince et al. 1999b). The EURO-D scale has been developed for measuring the prevalence of depression among older people within a European context. The EURO-D scale ranges from zero (no symptoms of depression existent) to 12 (12 symptoms of depression existent). The symptoms are depressed mood, pessimism, suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment and tearfulness. All the items refer to the presence of those symptoms within the last month (Prince et al. 1999b).
Education is measured by using the number of years of education, derived from ISCED categories. Since this information is not available for Israel, observations from Israel have to be excluded from the analytical sample.
Gender, operationalized as a dummy variable for female is entered into the analyses as an explaining variable. Furthermore, an interaction effect of both education and gender is part of the analyses in order to investigate gender differences. If the coefficient of the interaction effect has a negative sign the resource substitution theory is supported. In case it has a positive sign this assumes that the resource multiplication theory is supported.
The existing literature considers the fact that age and chronic diseases are correlated with mental health as well confirmed. Prevalence of depression rises with age, and persons suffering from chronic diseases are more likely to suffer also from depression. Thus, variables on age (in years) and the existence of the two or more chronic diseases are entered into the analyses. Household income adequacy is another control variable since the literature suggests that depression is correlated with economic hardship. Income adequacy is measured using a question on whether respondents are able to make ends meet with their household income. The original variable ranges from 1 representing "with great difficulty" to 4 representing "easily". The variable used in the analysis is dummy coded with 0 indicating difficulties with the financial situation (therefore including the categories "with great difficulty" and "with some difficulty") and 1 indicating respondents' ability to make ends meet (including the categories "fairly easy" and easy").
The analyses also contain a dummy variable on whether a respondent is employed or not. For those who report being employed two dummy variables are added in separate analyses which indicate whether respondents agrees to the statement that they receive an adequate salary and to the statement that the job offers room for skill improvement.
Since the personal sense of control is a mediator in the association between socio-economic status and depression, respondents' sense of control is part of the analyses. The sense of control over outcomes in own life is measured by building an additive index using a couple of questions from the CASP item battery. The CASP is an item battery designed in order to measure quality of life in older people. It contains questions on control, autonomy, self-realization and pleasure. The SHARE questionnaire used a short form of CASP containing 12 questions. The questions on control are "My age prevents me from doing the things I would like to", I feel that what happens to me is out of my control", and "I feel left out of things". The single variables range from 0 to 3 with higher values representing a higher sense of control.

Preliminary Results
Pooled OLS regressions support the findings from the Ross and Mirowsky study (see table 1). Model 1 regresses the number of depressive symptoms on gender and years of education (controlled for age and chronic conditions). Women report higher levels of depressive symptoms than men. More years of education are associated with less depressive symptoms. Model 2 adds the interaction effect between years of education and gender and thus tests the resource substitution and resource multiplication theory. The interaction is effect is negative

and significant and therefore supports the resource substitution theory: education benefits the mental health of women more than men's.
Model 3 holds constant other potential confounders such as marital status, employment status and income adequacy. Model 4 adds adjustment for the sense of control. Higher levels of control are significantly associated with lower levels of depressive symptoms. In model 5 I add an interaction term between gender and sense of control. The negative and significant coefficient implies a steeper negative slope of depression regarding the sense of control for women compared to men. Although models 3, 4 and 5 add several confounding variables, the negative interaction term between education and gender remains significant.
Repeating the regression from model 4 for various European regions (see table 2) reveals that the interaction term between gender and education is significant in Southern Europe (Italy, Spain, Greece and France), Eastern Europe (Poland and the Czech Republic) and Ireland. These preliminary results deserve further investigation but they point to the direction that the gender difference in the effect of education on mental health partly depends on the cultural context.
The analyses are still in a very preliminary state. Further investigations need to reveal whether the gender difference in the effect of education is significant for different levels of education. Future analyses could also investigate the impact of different job characteristics such as adequate salary and room for skill development. Another interesting question is also whether the gender difference in the effect of education remains once retirement age is reached. Preliminary analyses suggest that the resource substitution theory persist into retirement age.

Table 1: OLS Regression Analyses for the Number of Depressive Symptoms

	Model 1	Model 2	Model 3	Model 4	Model 5)
Age	0.0100***	0.0096***	0.0053***	-0.0090***	-0.0091***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
> 2 chronic diseases	0.9550***	0.9505***	0.8955***	0.6552***	0.6538***
	(0.024)	(0.024)	(0.024)	(0.023)	(0.023)
Female	0.7436***	1.1011***	0.9995***	0.9013***	1.1201***
	(0.022)	(0.064)	(0.063)	(0.058)	(0.080)
Years of education	-0.0439***	-0.0270***	-0.0142***	-0.0091**	-0.0113**
	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)
Years of education * female		-0.0339***	-0.0319***	-0.0262***	-0.0216***
		(0.005)	(0.005)	(0.005)	(0.005)
Married			-0.3575***	-0.2841***	-0.2791***
			(0.027)	(0.025)	(0.025)
Income adequacy			-0.6148***	-0.3725***	-0.3719***
			(0.026)	(0.025)	(0.025)
Employed			-0.1255***	-0.1170***	-0.1216***
			(0.029)	(0.028)	(0.027)
Control beliefs				-0.3394***	-0.3129***
				(0.005)	(0.007)
Control beliefs * female					-0.0477***
					(0.010)
Constant	1.0556***	0.8947***	1.8419***	4.6639***	4.5425***
	(0.104)	(0.106)	(0.130)	(0.129)	(0.132)
N	35854	35854	35854	35854	35854
R-sq	0.154	0.155	0.176	0.279	0.280

source: SHARE 2008, own calculations
remark: regression coefficient. standard errors in parentheses
*+ p<0.10. * p<0.05. ** p<0.01. *** p<0.001*

Table 2: OLS Regression Analyses for the Number of Depressive Symptoms by Region

	Northern Europe	Western Europe	Southern Europe	Eastern Europe	Ireland
Age	-0.0122**	-0.0020	0.0150***	0.0035	-0.0207*
	(0.004)	(0.002)	(0.003)	(0.005)	(0.008)
> 2 chronic diseases	0.5618***	0.8591***	1.0596***	1.1286***	0.9761***
	(0.052)	(0.039)	(0.047)	(0.068)	(0.129)
Female	0.4315**	0.5592***	1.0755***	1.3010***	1.1469**
	(0.159)	(0.111)	(0.098)	(0.228)	(0.397)
Years of education	-0.0178*	-0.0158**	-0.0164*	-0.1245***	-0.0222
	(0.008)	(0.006)	(0.007)	(0.013)	(0.020)
Years of education * female	-0.0013	0.0031	-0.0225*	-0.0660***	-0.0585*
	(0.012)	(0.009)	(0.009)	(0.020)	(0.030)
Married	-0.1771**	-0.3568***	-0.3599***	-0.2625***	-0.4952***
	(0.059)	(0.043)	(0.053)	(0.075)	(0.136)
Income adequacy	-0.7734***	-0.5960***	-0.4330***	-0.7241***	-0.5218***
	(0.080)	(0.045)	(0.043)	(0.067)	(0.128)
Employed	-0.2989***	-0.2101***	-0.0900	-0.3333***	-0.3573**
	(0.067)	(0.047)	(0.057)	(0.089)	(0.135)
Constant	3.3149***	2.4708***	1.2051***	3.5463***	3.7298***
	(0.305)	(0.196)	(0.233)	(0.368)	(0.652)
N	5694	12764	11479	4861	1056
R-sq	0.083	0.113	0.146	0.201	0.151

source: SHARE 2008, own calculations
remark: regression coefficient. standard errors in parentheses
*+ p<0.10. * p<0.05. ** p<0.01. *** p<0.001*

References

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