

Maintaining (Locus of) Control?

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What is the impact of locus of control on education decisions and wages?

Personality traits/Locus of control important determinants of:

- Choices (**behavioral** impact) mostly positive: Coleman & DeLeire (2003), Caliendo et al. (2010).
- Wages (**productive** impact) ambiguous: Duncan & Morgan (1981), Cebi (2007)

Technically challenging: measurement error, endogeneity

- Use factor analytical approaches to distinguish true latent abilities from measurement error (e.g. Heckman et al., 2006b; Hansen et al., 2004).
- Use measures prior to earnings (Duncan & Morgan, 1981; Heckman et al. 2006)
- Purge estimates of past wage influences (Bowles et al. 2001)
- Use past/other measures to instrument current measures (Osborne, 2000; Grnqvist & Vlachos, 2010)
- Model the technology of skills formation (Cunha & Heckman 2008)

Motivation

Our idea: Extract the distribution of the latent factor from a 'youth' sample (age 17), then measure its impact on labor market outcomes for a combined 'youth'/'adult' sample (Carneiro et al. 2003; Cunha et al., 2005).

Contribution of this paper: investigate the impact of 'premarket' locus of control on later outcomes.

Main finding: 'premarket' locus of control affects wages, but only through the channel of education.

Sample from the GSOEP

Youth sample: 17-year-old people

Adult sample: working people of ages 26-35 from West Germany

Outcomes of interest: Post-compulsory education, gross hourly wage.

Locus of control measurements: 10 items (youth sample)

Background information: number of siblings, parents' education, broken family, region, size of city, local unemployment rate

Sample size:

	Males	Females
Youth	760	774
Adults	600	592
Total	1360	1366

Model specification

Simultaneous equation model:

- Measurement system for locus of control (youth)
- Schooling decision: Binary choice indicator for 'higher education' ($S = 1$) (youth/adults)
- Labor market participation equation, for $s = 0, 1$ (adults)
- Wage equation, for $s = 0, 1$ (adults)

Latent factor:

$$\theta \sim N(0; \sigma_\theta^2) \quad \theta \perp\!\!\!\perp X \perp\!\!\!\perp \varepsilon$$

Error terms: standard normal (probits and ordered probits) or mixture of normals (wage equation)

Combining data sets to identify the likelihood

Some parts of the likelihood are identified only in the youth sample, in the adult sample, or in both:

$$\begin{aligned}\mathcal{L}(\psi|S, Y, E, M, X) &= \int_{\Theta} \prod_{s=0}^1 \Pr(S = s|X, \theta, \psi)^{\mathbf{1}[S=s]} \\ &\quad \times \prod_{s=0}^1 f(Y_s, E_s|X, \theta, \psi)^{\mathbf{1}[S=s]} \\ &\quad \times \prod_{k=1}^K f(M_k|X, \theta, \psi) dF(\theta),\end{aligned}$$

Missing data problem! Solution: combine the two samples to identify the likelihood (cf. Cunha et al., 2005)

Critical assumption: both samples same DGP!!

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Factor loadings in the outcome equations

	Males		Females	
	pooled	not pooled	pooled	not pooled
Education choice				
<i>S</i>	0.634***	0.404***	0.444***	0.364***
Labor market participation				
<i>E</i>	0.055		-0.021	
<i>E</i> ₀		0.757***		0.357**
<i>E</i> ₁		-0.126		-0.268
log Wages				
<i>Y</i>	0.181***		0.121***	
<i>Y</i> ₀		0.007		0.058
<i>Y</i> ₁		-0.072		0.020

Significance check: */**/** for the 10%/5%/1% significance level

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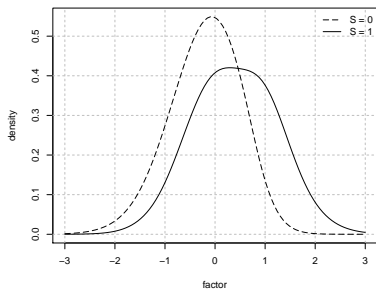
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Simulation of the model

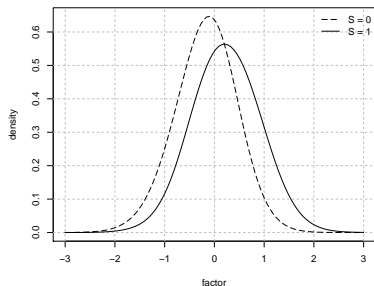
- Economic vs. statistical significance of the factor loadings.
- Actual impact of locus of control on schooling probabilities and labor market outcomes?
- Make use of our structural model and of the posterior sample of parameters to simulate the impact of locus of control on the outcomes.

Locus of control distribution by levels of schooling

Males

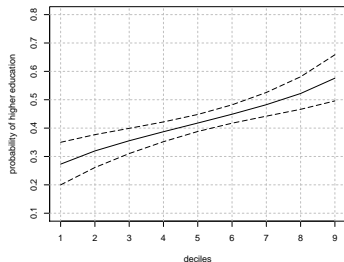


Females

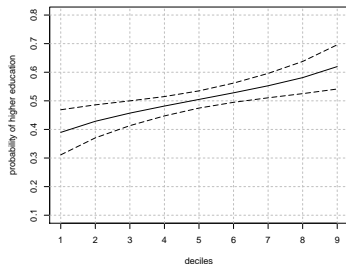


Impact of locus of control on schooling probabilities

Males (max. +0.30)

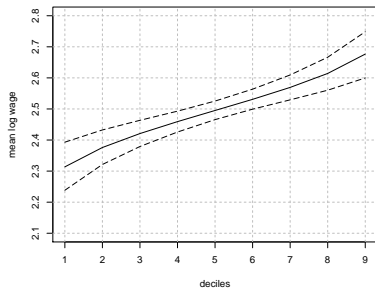


Females (max. +0.23)

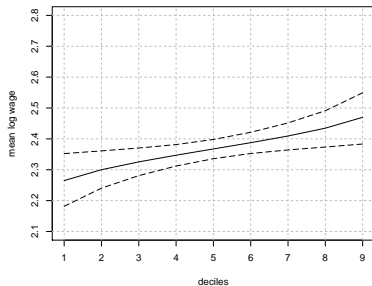


Impact of Locus of control on log wages

Males (max. +4.40EUR)



Females (max. +2.20EUR)



Questions and Conclusions

- 1** How firm is the correlational evidence on the predictive power of personality?
 - ⇒ Locus of control is a determinant for post-compulsory schooling.
 - ⇒ Different impact for males and females.
 - ⇒ Large overall effect. But put into perspective.
- 2** Correlational or causal?
 - ⇒ Address by using contemporaneous measurements and outcomes.
 - ⇒ Overall impact of premarket locus of control on wages only through education.
- 3** Separating personality variables from measures of cognition?
 - ⇒ Impossible with our data.
 - ⇒ Controlling for track recommendation (grammar school success) does not affect the results.

Thank you for your attention!