

# The Returns to Cognitive Abilities and Personality in Germany

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## Introduction

### Motivation

Traditionally, 'hard-wired' human capital aspects - e.g. education, experience, job training... are the focus of labor economists.

Growing research additionally incorporates cognitive abilities, but restricted data availability (NLSY in US: AFQT, NCDS in UK: GAT).

Even smaller literature on the labor market outcomes of personality.

### Importance of personality for labor market success

Similar to cognitive skills, personality traits may likewise result in job performance differentials.

Differences in skills and differences in preferences may exert direct and indirect effects on productivity:

- **Direct effect:** Personality (its effects on behavior) might be thought of as part of an individual's set of productive traits
- **Indirect effect:** through the type of schooling or occupation chosen

### Previous Research

Scarce evidence on the relationship between cognitive abilities, personality, and earnings (U.S. data):

- Mueller & Plug 2006: Non-agreeableness, openness, emotional stability rewarded; positive linear relationship between intelligence and earnings
- Cebi 200: Internal LOC rewarded in the labor market even when cognitive ability scores are included
- Heckman et al. 2006: Both cognitive skills and personality important for economic success

**Aim of this Study:** First joint evidence on the relationship between cognitive abilities, personality, and earnings for Germany. Find out whether results for the U.S. carry over to (1) a less meritocratic society (more labor market regulations) and (2) a society with mainly free access to schooling (at no or very low cost). Employ panel estimators to account for unobservable heterogeneity.

## Data and Methods

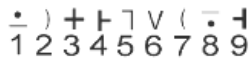
**Data:** Two cross-sections from the SOEP: 2005 (observation of personality traits), 2006 (observation of cognitive abilities)

**Sample:** East and West-German male and female workers of age 20 to 60, years 1991-2006, ~ 12,879 person-year observations (1,554 individuals)

### Measures of cognitive ability:

2 ultrashort tests (Lang, 2005)

- **Word fluency test** (crystallized pragmatics): Respondents have 90 seconds to name as many different animals as possible.
- **Symbol correspondence test** (fluid mechanics): Respondents have 90 seconds to assign as many correct signs as possible to the consecutively displayed digits, while the appropriate assignment code is visible to them.



### Measures of personality:

- **Five Factor Model indicators:** openness to experience, conscientiousness, extraversion, agreeableness, neuroticism (set of 15 questions instead of full inventory)
- **Locus of control:** internal and external LOC (10 items)
- **Positive and negative reciprocity** (6 items)

We use standardized average scores from the cognitive ability test scores and from the dimension-specific questions on FFM, LOC, and reciprocity.

### Estimation Methods:

- Selection corrected Mincer-type earnings functions.
- We match 'residualized' indicators (free from age and gender effects) to prior waves of the SOEP and apply appropriate panel estimators (Hausman-Taylor IV estimator) to account for further individual specific heterogeneity
- Separate regressions for males and females.

**Dependent Variable:** gross hourly wage

### Control Variables:

education, age, married, foreign citizenship, East German, public sector, firm size, temporary job, part-time job, white-collar worker (occupation, industry)

## Results

	Females: RE	Females: HT-IV	Males: RE	Males: HT-IV
<b>Personality traits</b>				
FFM: Openness	0.016 (0.015)	0.026 (0.024)	-0.001 (0.014)	0.010 (0.023)
FFM: Conscientiousness	-0.004 (0.015)	-0.008 (0.024)	0.014 (0.013)	0.005 (0.021)
FFM: Extraversion	-0.007 (0.016)	-0.005 (0.025)	0.003 (0.013)	-0.001 (0.021)
FFM: Agreeableness	-0.023* (0.013)	-0.033 (0.022)	-0.009 (0.012)	-0.006 (0.019)
FFM: Neuroticism	0.001 (0.013)	-0.002 (0.022)	-0.005 (0.012)	-0.006 (0.019)
External locus of control	-0.060*** (0.014)	-0.072*** (0.023)	-0.064*** (0.012)	-0.079*** (0.019)
Positive reciprocity	0.020 (0.014)	0.024 (0.022)	0.025** (0.012)	0.030 (0.020)
Negative reciprocity	0.005 (0.013)	0.002 (0.022)	0.016 (0.012)	0.012 (0.019)
<b>Cognitive abilities</b>				
Symbol corresp. Test	0.012 (0.015)	0.013 (0.025)	0.029** (0.013)	0.032 (0.021)
Word fluency Test	-0.009 (0.016)	0.003 (0.026)	0.017 (0.013)	0.018 (0.022)
Individ. controls	+	+	+	+
Occ. / industry controls	+	+	+	+

### Results and Conclusions

- Weak effect of cognitive abilities on males' wages once individual heterogeneity is accounted for (positive effect in the pooled OLS specification).
- Personality is an important predictor of earnings, even if a large set of control variables and cognitive abilities are included.
- Very robust result: negative association between high external locus of control and earnings: wage penalty of almost 12% for workers who score in the top25% of the LOC scale (effect of comparable size as in the US).
- The findings suggest a relatively greater importance of certain personality traits compared to cognitive abilities.

### Implications:

"... personality traits are more malleable than cognitive ability over the life cycle and are more sensitive to investment by parents and to other sources of environmental influences at later ages than are cognitive traits. Social policy designed to remediate deficits in achievement can be effective by operating outside of purely cognitive channels."

(Borghans, Duckworth, Heckman & ter Weel, 2008, p. 4)