

# Cognitive ability and personality traits of incarcerated young males

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# Outline

- Background:
  - Why we did what we did
  - What has been found before
- Aims
- The study and results
- Implications

# How incarcerated offenders differ from non-incarcerated young males: where should we look?

- Millions of ways to describe differences between people:
  - Cognitive – maximum performance → intelligence
  - Non-cognitive – typical performance → personality traits
- Describe differences comprehensively:
  - So that all of the important ways people differ from each other are covered
- Do that as economically as possible:
  - Otherwise no one would be able to grasp the picture

# Personality: how much information we want?

- Numerous different combinations of traits to describe individual differences:
  - Compare people along one dimension (e.g. good-bad) – not informative
  - .. two dimensions (e.g. negative emotionality; positive emotionality)
  - .. three dimensions (e.g. ... + disinhibition) – already more informative
  - But could we have even more information?

# State of art

- Most popular to describe differences in five broad categories (FFM)
  - Arguably the most optimal model
  - Economic and broad coverage of most important personality differences
- For even more fine-grained description, however, the broad categories should be split into more specific facets
  - The “NEO-PI-R model” – each of the five domains is split into 6 facets

- **Neuroticism** - tendency to experience unpleasant emotions, sometimes called emotional instability
  - anxiety, depression, hostility, self-consciousness, impulsiveness, vulnerability
- **Extroversion** - tendency to seek stimulation in the company of others, to look for and experience positive emotions
  - friendliness, gregariousness, assertiveness, activity, excitement seeking, joyfulness
- **Openness to experiences**
  - Fantasy, interest in art, openness to emotions, adventurousness, intellectual interest, liberality
- **Agreeableness** - tendency to be compassionate and cooperative rather than suspicious and antagonistic towards others
  - trustfulness, morality, altruism, cooperation, modesty, sympathy
- **Conscientiousness** – tendency to control for self and be purposeful
  - competence, orderliness, dutifulness, achievement orientedness, self-discipline, carefulness

# Taken together

- The five-factor personality model is currently believed to be the most comprehensive and universal way to describe differences between people:
  - If we know about an individual her distinctive levels on these 5 (30) traits, we should have a fairly good picture of who she is: how she tends to feel, think and behave
- Many believe that this applies for both normal and “disturbed” personality – an important assumption here!

# Cognitive differences

- There are many different types of tasks that demand mental effort and induce differences between people:
  - Verbal tasks, visual tasks, auditive tasks, geography tasks, math tasks etc.
- The dogma of empirical research on human cognitive differences:
  - Those who perform above average in one type of task, also tend to perform above average in other type of tasks
- There might be some kind of general cognitive power that influence performance in whatever different types of mental tasks ( $g$ )

- People differ with respect to the general power ( $g$ ):
  - it explains ~50% of the variance in the performance of many specific mental tasks
- We get about 50% of the maximum information measuring only  $g$
- In complex behaviour, people rely simultaneously on many specific cognitive processes, while  $g$  is part of all these specific processes
  - Thus, “being everywhere”,  $g$  is the most important cognitive trait

# The traits are consequential

- Individual differences in personality traits and  $g$  are not just nice concepts psychologist like to play with:
  - The traits predict individual differences in important life outcomes
  - The ultimate criterion of their usefulness

# The power of *g* and FFM traits

- Predict educational outcomes such as grades or educational level
  - *g* explains roughly 25% of the variability in educational outcomes
  - Perhaps the best predictor

Pearson's correlations between predictors and GPA

Grade	SPM	<i>N</i>	<i>E</i>	<i>O</i>	<i>A</i>	<i>C</i>
2	0.54 (0.54) <sup>***</sup>	-0.15 <sup>**</sup>	0.03	0.26 <sup>***</sup>	0.23 <sup>***</sup>	0.14 <sup>**</sup>
3	0.46 (0.50) <sup>***</sup>	-0.13 <sup>*</sup>	0.06	0.25 <sup>***</sup>	0.29 <sup>***</sup>	0.19 <sup>***</sup>
4	0.49 (0.53) <sup>***</sup>	-0.12 <sup>*</sup>	0.07	0.28 <sup>***</sup>	0.25 <sup>***</sup>	0.23 <sup>***</sup>
6	0.53 (0.64) <sup>***</sup>	-0.25 <sup>***</sup>	0.14 <sup>**</sup>	0.12 <sup>**</sup>	0.23 <sup>***</sup>	0.32 <sup>***</sup>
8	0.48 (0.63) <sup>***</sup>	-0.16 <sup>***</sup>	-0.00	0.13 <sup>**</sup>	0.08 <sup>*</sup>	0.21 <sup>***</sup>
10	0.43 (0.65) <sup>***</sup>	-0.19 <sup>***</sup>	-0.01	0.18 <sup>***</sup>	0.12 <sup>**</sup>	0.30 <sup>***</sup>
12	0.32 (0.54) <sup>***</sup>	-0.11 <sup>*</sup>	-0.04	0.11 <sup>*</sup>	0.00	0.20 <sup>***</sup>

*Note:* GPA = grade point average, SPM = Standard Progressive Matrices, *N* = Neuroticism, *E* = Extraversion, *O* = Openness, *A* = Agreeableness, *C* = Conscientiousness.

Correlations corrected for restriction of range are shown in parentheses.

	<i>k</i>	<i>N</i>	<i>r</i>
Correlation with education			
Intelligence (all studies)	59	84,828	.46
Intelligence (best studies) <sup>a</sup>	20	26,504	.49
Father's education	72	156,360	.40
Mother's education	57	141,216	.37
Father's occupation	55	147,090	.34
Parental income	13	64,165	.29
SES index	17	69,082	.41

Strenze, 2007

# The power of *g* and FFM traits

- Predict occupational outcomes
  - *g* explains roughly 10-25% of the variability in occupational outcomes
  - One of the best predictors

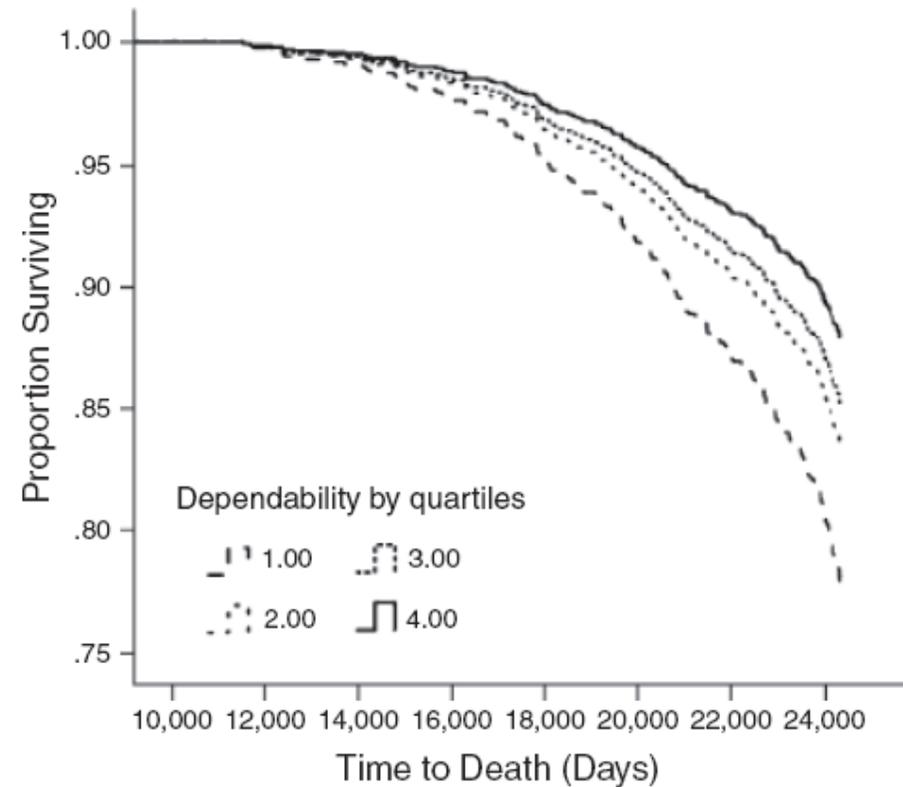
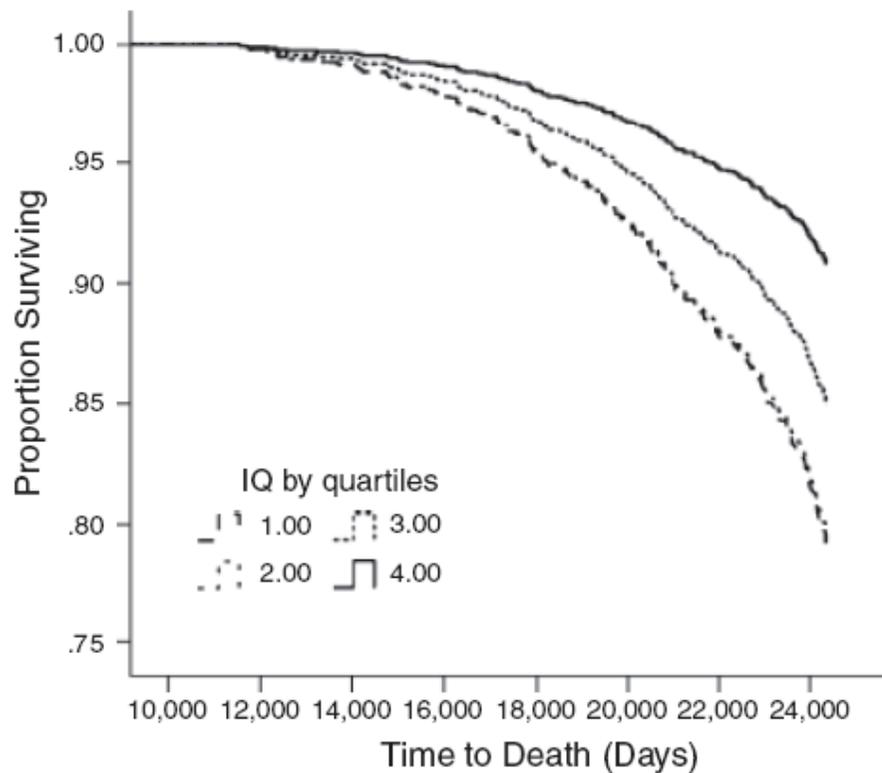
Variable	1	2	3	4	5	6	7	8	9
1. Neuroticism	1.00	-.43**	-.10	-.62**	-.49**	-.30**	-.22*	-.26**	-.26**
2. Extraversion	-.62**	1.00	.07	.26**	-.24**	.09	-.06	.25**	.00
3. Openness to experience	-.07	.18**	1.00	-.25**	.34**	.51**	.21*	.10	.32**
4. Agreeableness	-.44**	.24**	-.10	1.00	.25	-.10	.13	-.01	-.02
5. Conscientiousness	-.65**	.18**	.03	.18**	1.00	.53**	.40**	.16†	.49**
6. General mental ability	-.22**	.14†	.33**	-.07	.29**	1.00	.30**	.31**	.51**
7. Job satisfaction	-.26**	.12	-.09	-.26**	.20**	.25**	1.00	.26**	.12†
8. Income	-.32**	.24**	-.01	-.11	.34**	.29**	.26**	1.00	.35**
9. Occupational status	-.27**	.09	.26**	-.04	.48**	.48**	.12†	.35**	1.00

	<i>k</i>	<i>N</i>	<i>r</i>
Correlation with occupation			
Intelligence (all studies)	45	72,290	.37
Intelligence (best studies) <sup>a</sup>	21	43,304	.41
Father's education	52	132,591	.27
Mother's education	40	116,998	.24
Father's occupation	57	146,343	.28
Parental income	12	60,735	.19
SES index	16	74,925	.30
Academic performance	17	54,049	.33

Strenze, 2007

# The power of $g$ and FFM traits

- Predict health outcomes like mortality, morbidity and health behaviours



Deary et al., 2008

# Thus ...

- Describing differences between people in terms of FFM personality traits and  $g$  is informative:
  - This should also apply differences between offenders and non-offenders
- In addition:
  - We have good measures for those traits
  - Results are comparable to other findings

# What have other studies found?

- Cognitive ability deficit of offenders is well documented:
  - The interesting questions are the extent of the deficit and mechanisms
- The difference is about 8 IQ points – not a large difference
- The potential mechanisms:
  - Low ability causes criminal behaviour
  - Criminal life causes low ability
  - Only low-ability offenders get caught
  - Low social class
  - Low motivation to complete ability tests

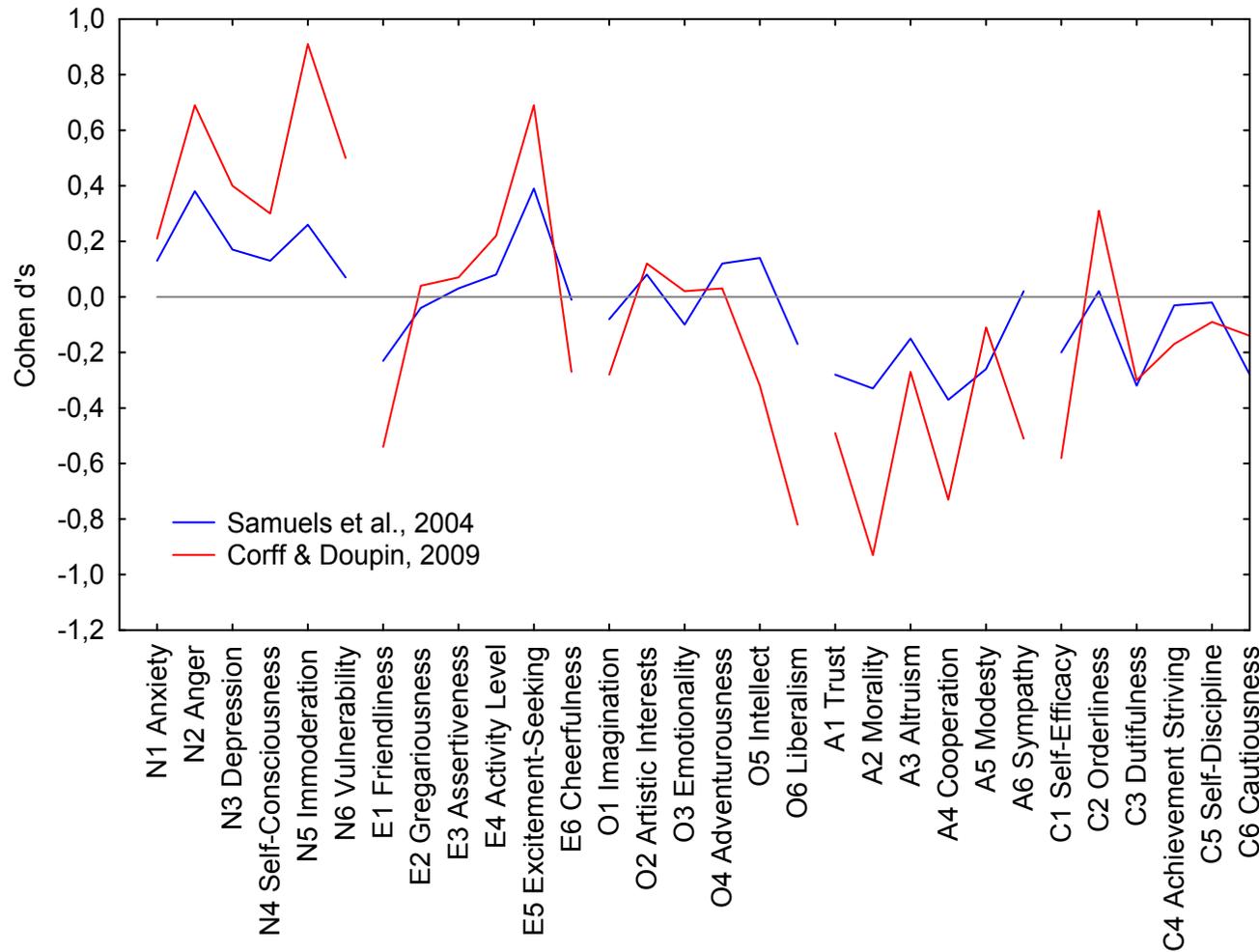
# What have other studies found?

- Personality differences in terms of five-factor descriptive model are not so well known
- Broad domains – several studies:
  - Antisocially behaving people characterize themselves as low on agreeableness and conscientiousness
- Surprisingly few studies describing offender-non-offender differences in terms of more specific FFM traits.

Table 3. NEO Personality Scores in 1993 to 1999, by Prior Arrest (1981 to 1993)

	Prior Arrest		Test Statistic ( $t_{609}$ )	P Value
	No (n = 532)	Yes (n = 79)		
Neuroticism	49.9	53.6	3.09	.002
Anxiety	49.1	50.9	1.55	.12
Angry hostility	50.4	55.7	4.66	<.001
Depression	50.9	53.5	2.06	.04
Self-consciousness	49.8	51.6	1.66	.10
Impulsiveness	48.6	52.0	3.15	.002
Vulnerability	50.7	51.9	0.91	.36
Extraversion	47.5	48.3	0.67	.50
Warmth	47.5	44.1	2.81	.005
Gregariousness	50.1	49.5	0.54	.59
Assertiveness	48.7	49.2	0.41	.68
Activity	47.5	48.5	0.93	.35
Excitement-seeking	48.0	52.9	4.83	<.001
Positive emotions	47.7	47.6	0.11	.91
Openness	45.8	46.0	0.14	.89
Fantasy	48.3	47.3	0.93	.35
Aesthetics	48.7	49.8	0.93	.35
Feelings	47.7	46.2	1.24	.22
Actions	45.9	47.5	1.44	.15
Ideas	47.1	49.0	1.68	.09
Values	46.0	43.7	2.07	.04
Agreeableness	49.2	43.8	4.32	<.001
Trust	46.6	42.2	3.42	.001
Straightforwardness	49.5	44.8	4.04	<.001
Altruism	49.1	46.7	1.89	.06
Compliance	49.4	43.8	4.51	<.001
Modesty	50.8	46.9	3.19	.001
Tender-mindedness	51.8	52.1	0.28	.78
Conscientiousness	47.0	44.3	2.31	.02
Competence	48.2	45.1	2.45	.02
Order	46.3	46.5	0.27	.79
Dutifulness	47.0	42.3	3.92	<.001
Achievement-striving	46.9	46.4	0.42	.67
Self-discipline	46.3	46.0	0.23	.82
Deliberation	52.0	48.2	3.48	.001

	t
<b>Neuroticism</b>	3.18**
Anxiety	1.04
Angry hostility	3.37**
Depression	1.97*
Self-consciousness	1.49
Impulsiveness	4.48**
Vulnerability	2.48*
<b>Extroversion</b>	0.21
Warmth	-2.63**
Gregariousness	0.21
Assertiveness	0.34
Activity	1.06
Excitement-seeking	3.38**
Positive emotions	-1.31
<b>Openness</b>	-1.29
Fantasy	-1.36
Aesthetics	0.59
Feeling	0.12
Actions	0.16 <sup>a</sup>
Ideas	-1.58
Values	-4.01**
<b>Agreeableness</b>	-3.80**
Trust	-2.42*
Straightforwardness	-4.53**
Altruism	-1.30
Compliance	-3.58**
Modesty	-0.55
Tender-mindedness	-2.48*
<b>Conscientiousness</b>	-1.00 <sup>b</sup>
Competence	-2.85**
Order	1.53
Dutifulness	-1.48
Achievement-striving	-0.84
Self-discipline	-0.45 <sup>c</sup>
Deliberation	-0.68



$r = 0.81$

This might be a benchmark to compare our results to

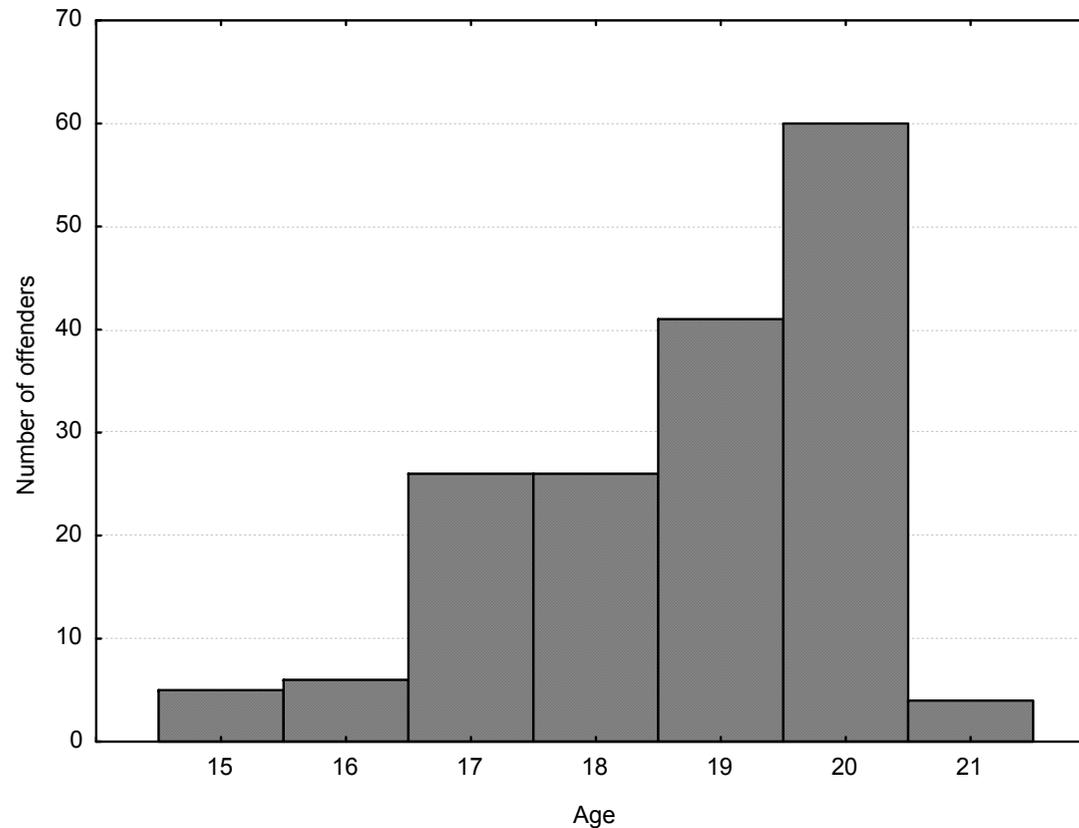
# Aims of the study (1)

- Test the usability of self-report personality instruments in prisoners:
  - Can detect non-consistent responding
  - Can't detect deliberate distorting
- How offenders differ from non-offending age-mates:
  - Low IQ but how low
  - Low on Agreeableness and Conscientiousness but does the facet level profile correspond to previous finding

# Aims of the study (2)

- Variability within the group of offenders:
  - Do ability and personality traits predict aspects of disruptive behaviour or school success?
- The study could be the basis for further research:
  - More tailored hypotheses
  - Extend dataset
  - Follow-ups

# The sample – 167 young offenders



Mean age  $18.7 \pm 1.4$  years

86 Estonian-speakers

93% had no more than basic education

# Tests

- Standard Progressive Matrices
  - A well-known 60-item ability test based on the general ability testing principles by Charles Spearman
  - Measures general abstract problem solving
  - A paper-pencil test with no time limit
- EE.PI-NEO
  - Five dimensions, six facets in each
  - 240 items, easy to read, psychometric properties good
- RU.PIP-NEO
  - Used for the first time, psychometric properties unknown

# Comparison group – cognitive ability

- 15-year-olds:
  - 222 boys from 9<sup>th</sup> grades of general schools
- 16...18-year-olds:
  - 848 boys from general schools and 340 boys from vocational schools
  - Two main routes of (obligatory) education
  - Weighted mean scores of vocational and general school students
- 19+ years:
  - Scores of 18-year-olds
  - Difficult to get a population estimate from the existing data

# Comparison group – personality (Estonian)

- 792 boys:
  - Mean age  $18.6 \pm 2.2$  years (14-21)
  - Students of general schools, conscripts, university students

# Comparison group – personality (Russian)

- 262 boys:
  - Mean age  $17.6 \pm 2.2$  years (14-22)
  - Students of general and vocational schools, conscripts

# Background variables

- Relationship quality with caregiver
- Social economic status
- School success (pre-prison and in prison)
- Psychiatric diagnoses
- Crimes committed
- Disciplinary problems in prison
- Age at first imprisonment
- Total number of imprisonments
- Total number of days spent in prison

# Contact persons

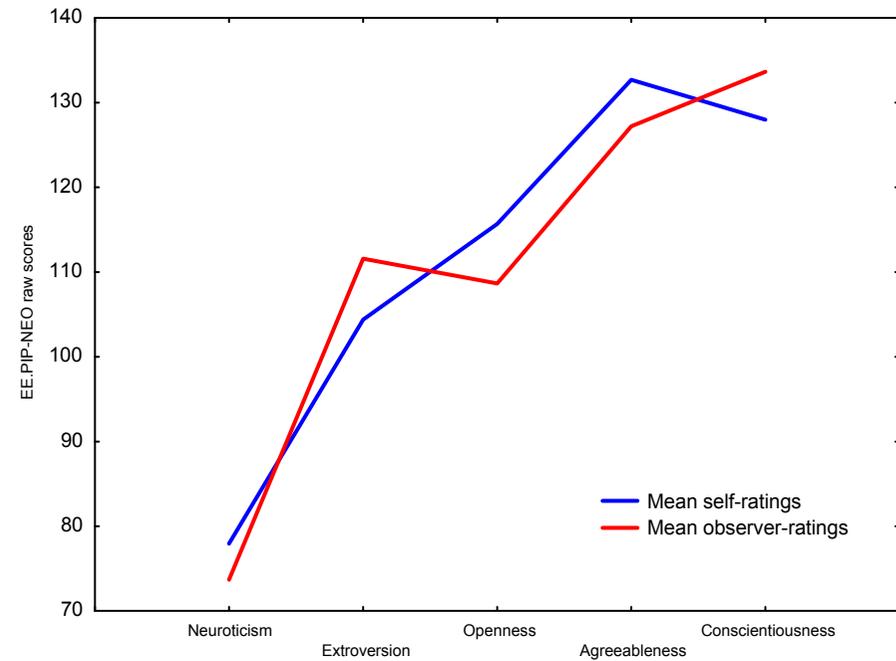
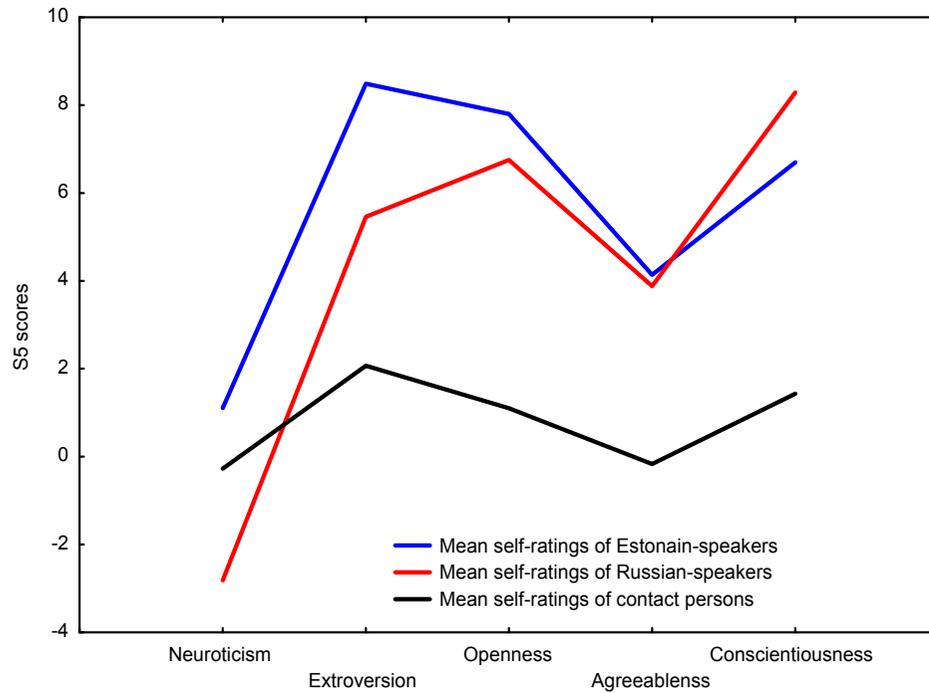
- Validating self-reports (asymmetry!)
- Interesting in itself
  - Usually found agreement above chance even in zero-acquaintance
  - Though not in schools
- 30 item questionnaire:
  - Measure the same 30 traits as EE.PIP-NEO
  - Self- and observer reports about 132 offenders (6 raters)

# Results – the psychometrics

- For Standard Progressive Matrices – no reason to go into details
- For personality test:
  - Internal consistency of scales – the items that measure the same trait should be rated similarly, inconsistencies are first symptoms of erratic responding
  - Factor structure: the scores of similar traits (belonging to the same broad five-factor domain) should be similar, inconsistencies are indicative of problems
  - Cannot rule out deliberate distortion, but can rule out random responding

- In comparison groups:
  - Internal consistencies and factor structures were generally relatively fine (i.e. similar to the “normative”)
- In offenders:
  - Internal consistencies were lower, especially in Adventurousness and Liberalism facet scales
  - Factor structures were not as close to the normative as in comparison groups
  - However, the differences were not substantial – by and large, offenders filled out test in a consistent manner
  - Respondents might have distorted the responses but, at least, they did it consistently

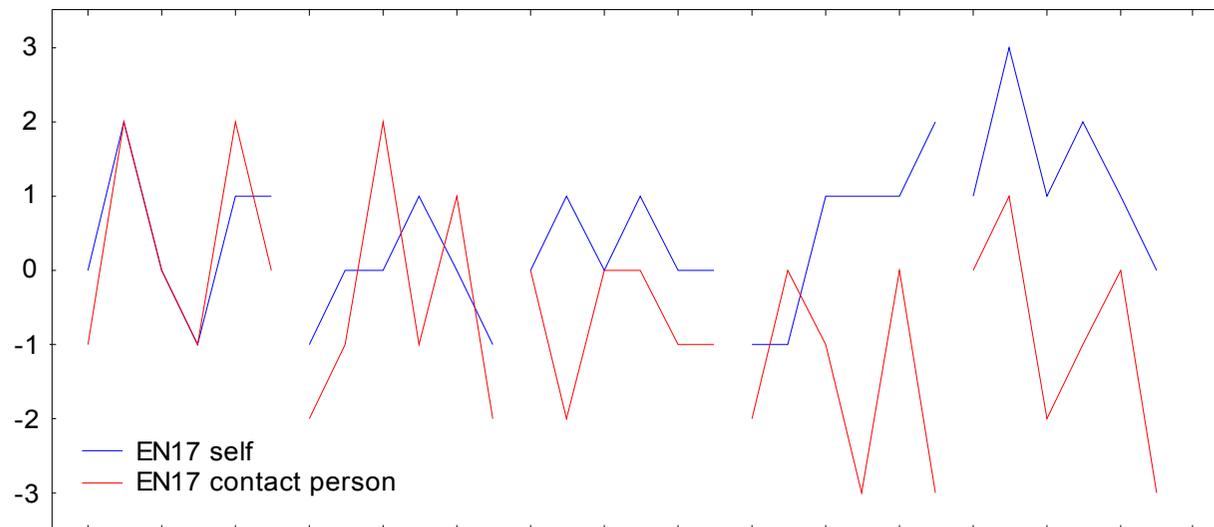
# Self-contact person agreement



- Self-enhancement?
- Offender-derogation?

# Two strategies

- Correlating variables:
  - For each trait, similarity of offender's rankings according to self-ratings and contact-person ratings
- Correlating profiles:
  - Each person has two personality rating profiles consisting of 30 traits



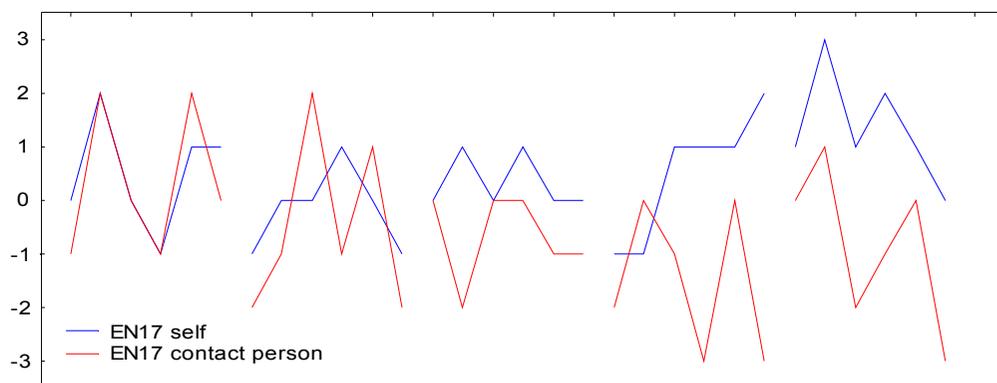
$r = 0.20$

## Self-contact person agreement

	S5 Estonian <sup>†</sup> N = 71	EE.PIP -NEO N = 71	S5 Russian <sup>†</sup> N = 57	RU.PI P-NEO N = 58
Neuroticism	<b>0.26</b>	<b>0.30</b>	0.01	0.03
Extroversion	-0.11	-0.04	0.12	<b>0.31</b>
Openness	0.07	0.15	-0.18	0.12
Agreeableness	0.18	<i>0.21</i>	-0.03	-0.05
Conscientiousness	0.08	0.10	-0.06	0.08

# Profile correlations

- Very low: in Estonians average coefficient 0.05, in Russians 0.09
- For comparison, average profile correlations between offenders' two self-reports 0.49

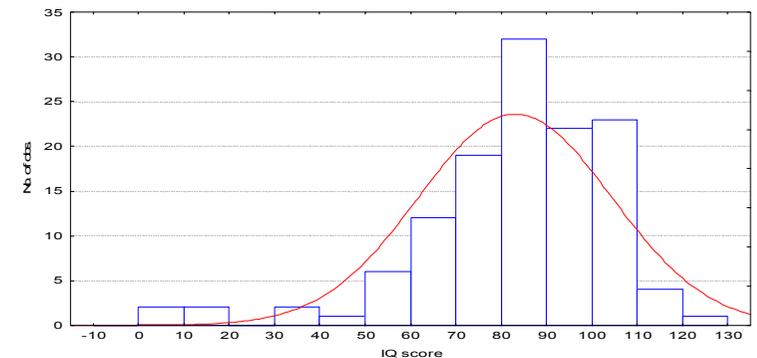
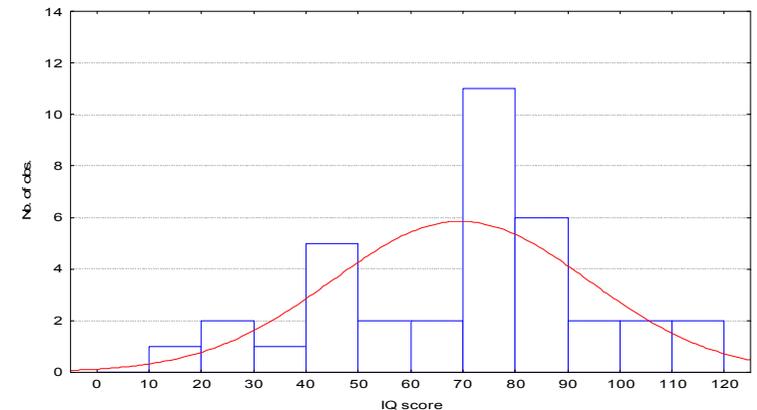


# Conclusions

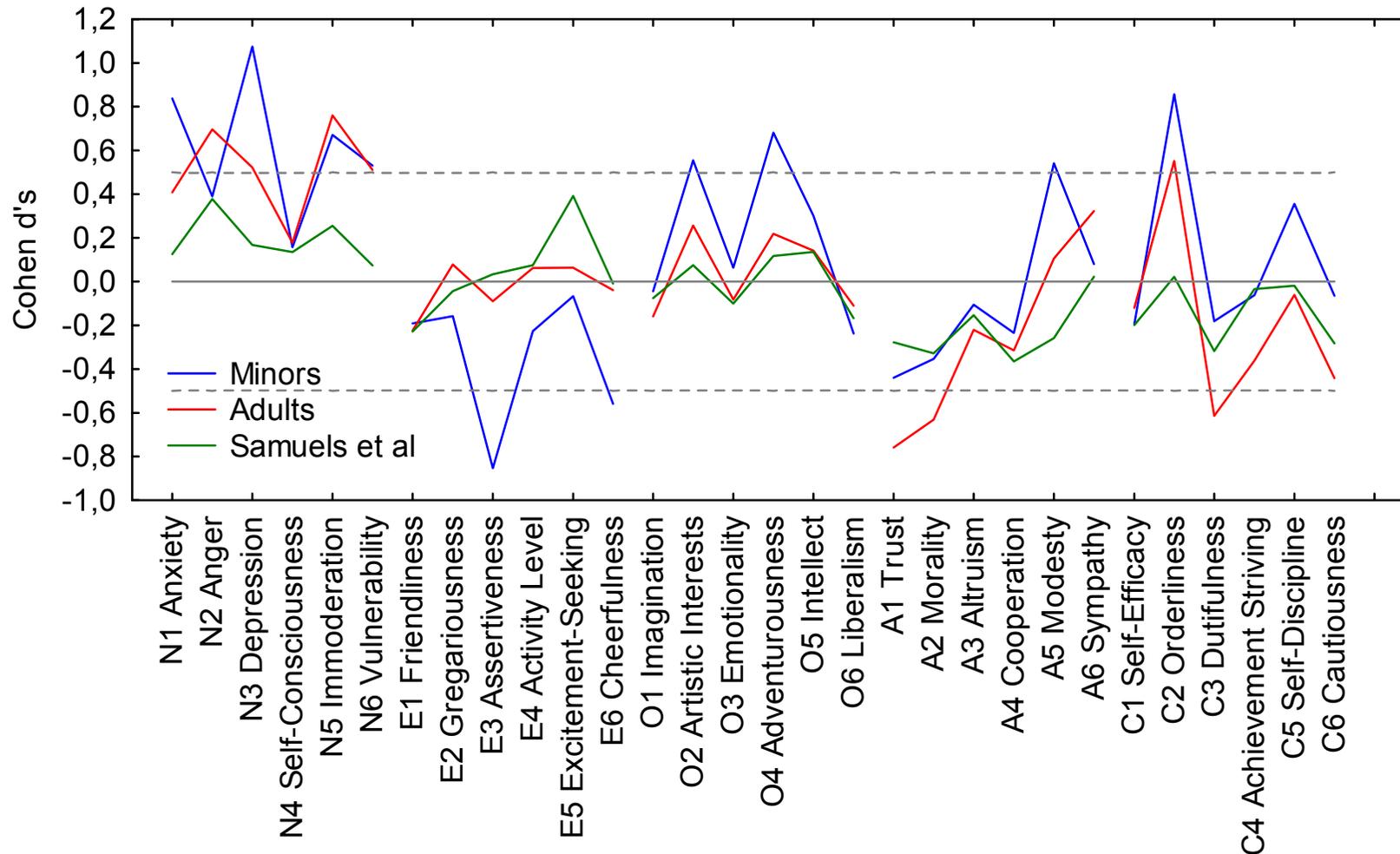
- Surprising?
  - Somewhat
  - Similar findings in schools
- Who is wrong?
  - Difficult to say
  - Perhaps nobody is wrong, true individual differences may be hidden in prison context
- Yet important:
  - Prison staff makes consequential decisions about offenders' characteristics
  - Potential source of conflicts

# Cognitive ability

- Not low but *very* low, on average
  - Scores ranged from 5 to 60
  - Removed scores below 3 standard deviations
  - Adolescence (<18): mean IQ 70 (15 to 114)
  - Average score on the 3<sup>rd</sup> percentile
  - Adults: mean IQ score 83 (5 to 122)
  - Average score on the 13<sup>th</sup> percentile
  - Mean SPR scores match to those of 11-12-year-olds (5<sup>th</sup> grade)
  - Ability matches their educational level



# Personality traits of Estonian-speakers

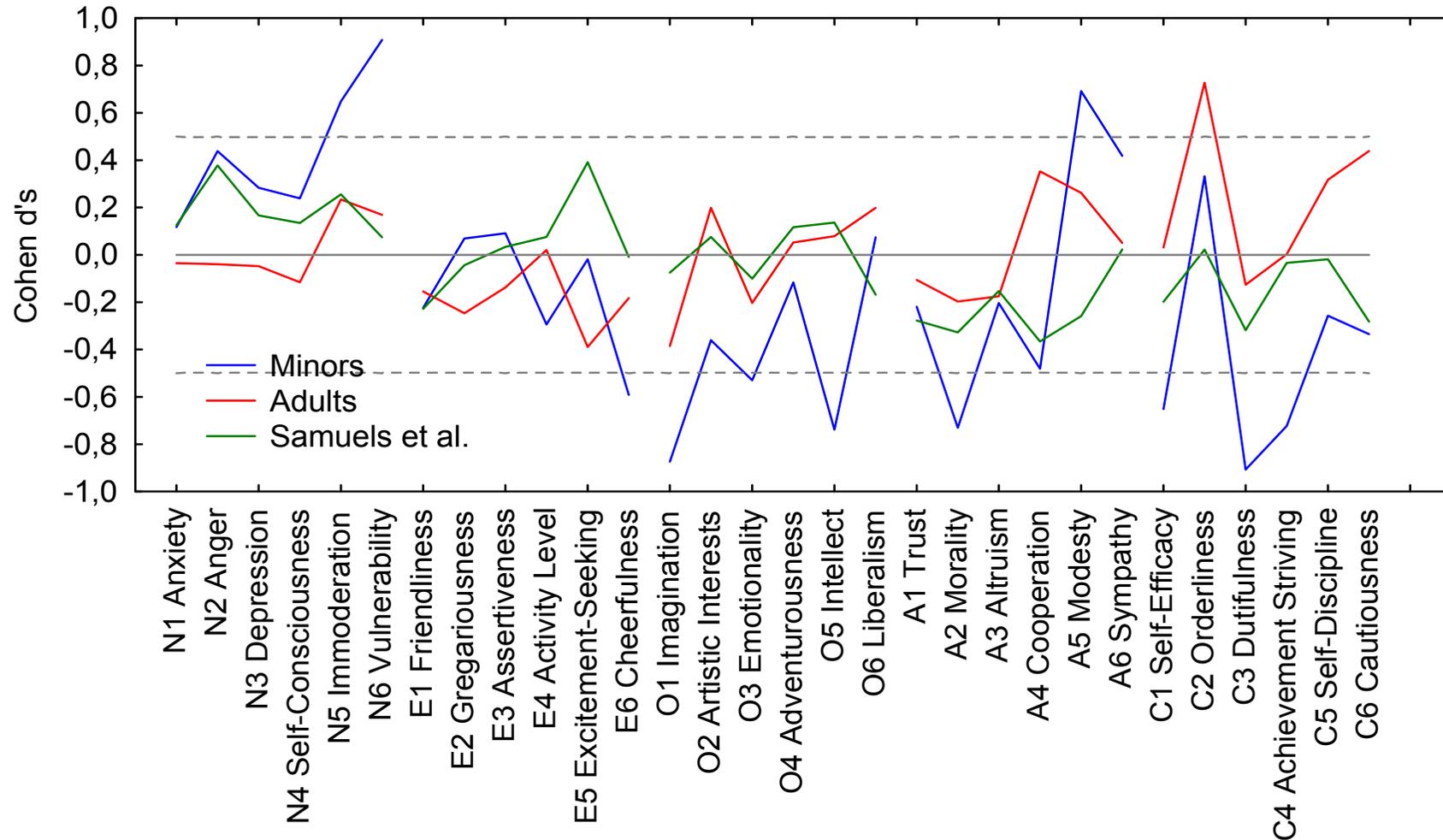


minors – adults:  $r = 0.76$

adults – Samuels et al:  $r = 0.79$  (0.74)

minors – Samuels et al:  $r = 0.47$  (0.55)

# Personality traits of Russian-speakers



minors – adults:  $r = 0.31$

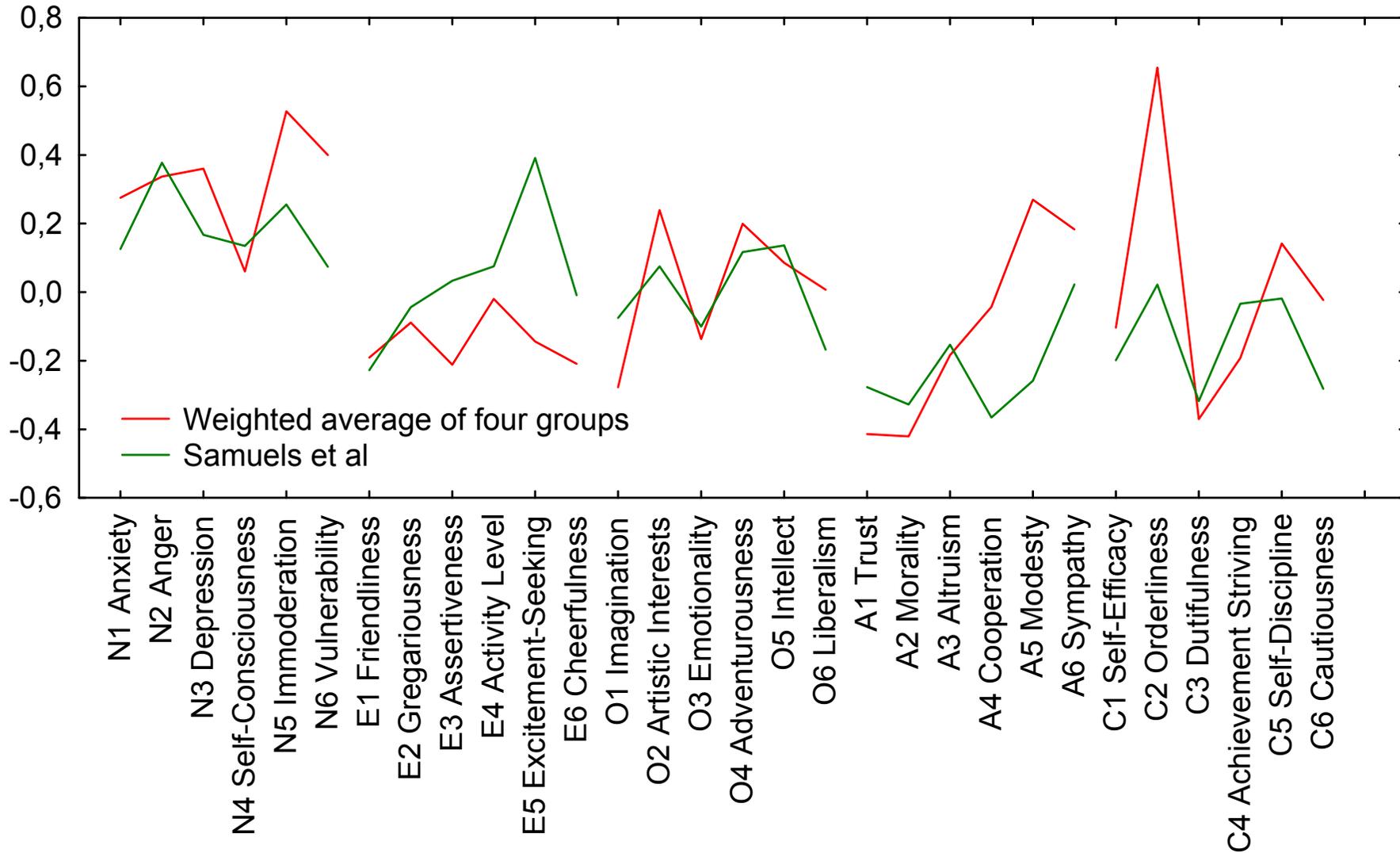
adults – Samuels et al:  $r = -0.12$  (0.05)

minors – Samuels et al:  $r = 0.44$  (0.58)

# So far so good

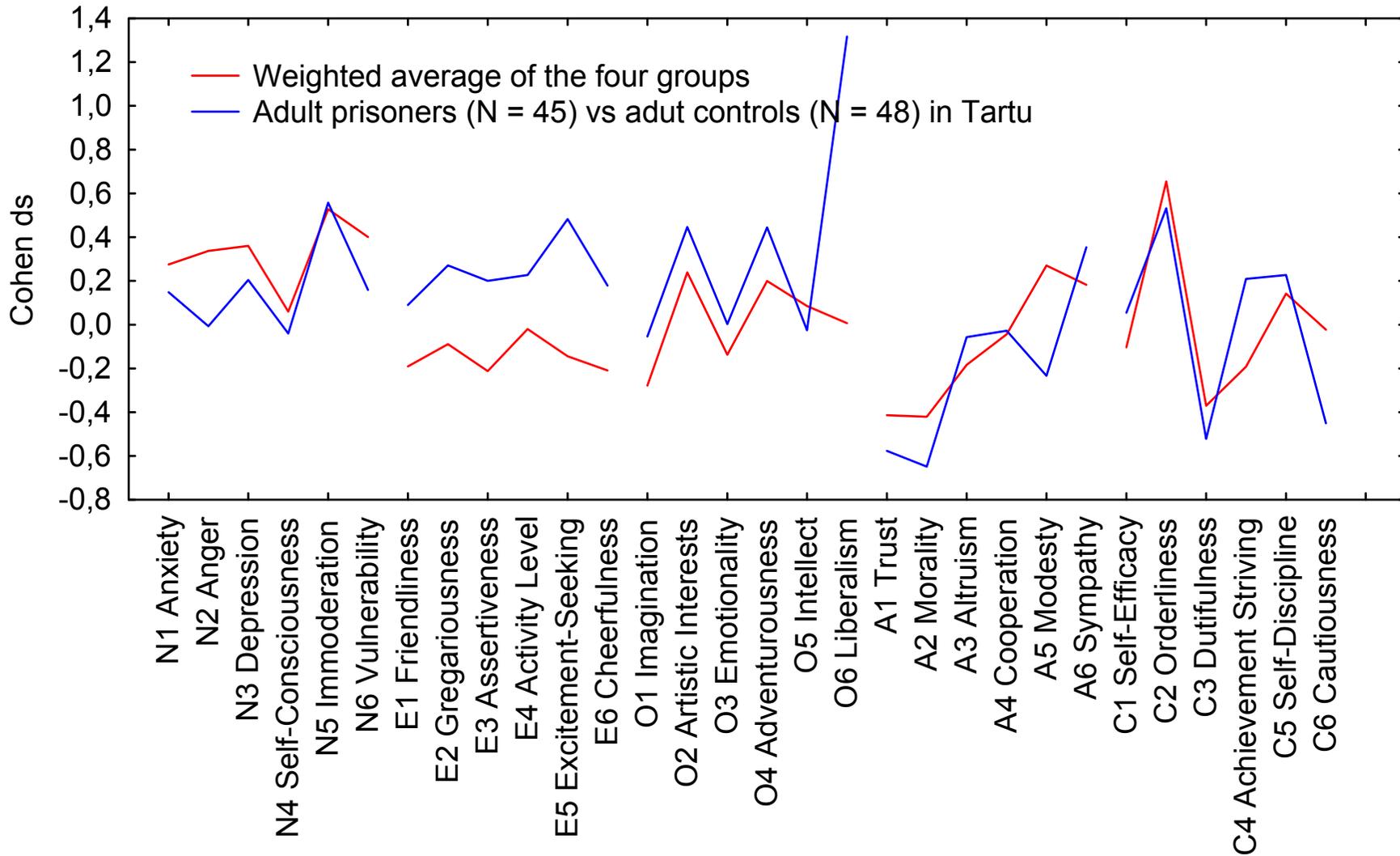
- In Estonian-speakers (and Russian minors), the hypotheses were confirmed
- In Russian-speaking adults, the results were unexpected:
  - Status of offenders? – not
  - Biased controls? – not (mean scores of Russian controls were extremely similar to mean scores of Estonian controls,  $r = 0.91$ )
  - Random flukes? – perhaps
  - Different etiology of offending in Russians? – perhaps

# Collapsed groups



$r = 0.54 (0.61)$

# Adults from Tartu prison

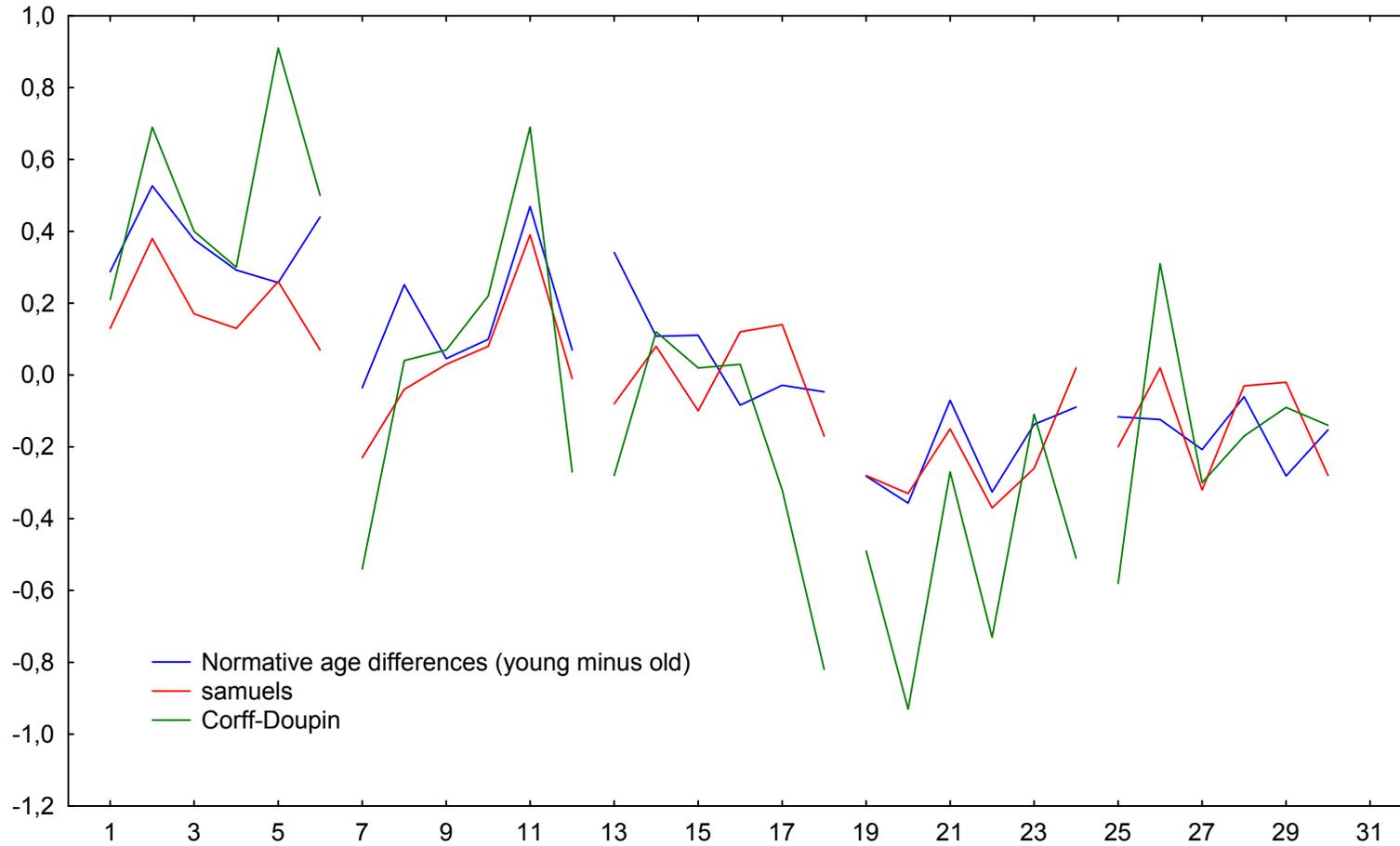


$r = 0.47$  (Jöhvi and Tartu)

# Conclusions

- The broad five domain are not homogeneous in distinguishing offenders from non-offenders:
- There appears to be a somewhat universal personality trait configuration that distinguishes offenders from non-offenders although this clearly needs more research
- Identifying a specific personality signature of offenders would be an important finding:
  - It could help to make predictions about individuals
  - E.g. we could investigate whether less typical offenders have better prognosis in future.
  - Self-report personality ratings are by no means perfect even some incremental validity in differentiating the “bad” from the the “better” could be very helpful

# Immaturity?



$r = 0.78$  (Samuels) and  $r = 0.75$  (Corff & Doupin)

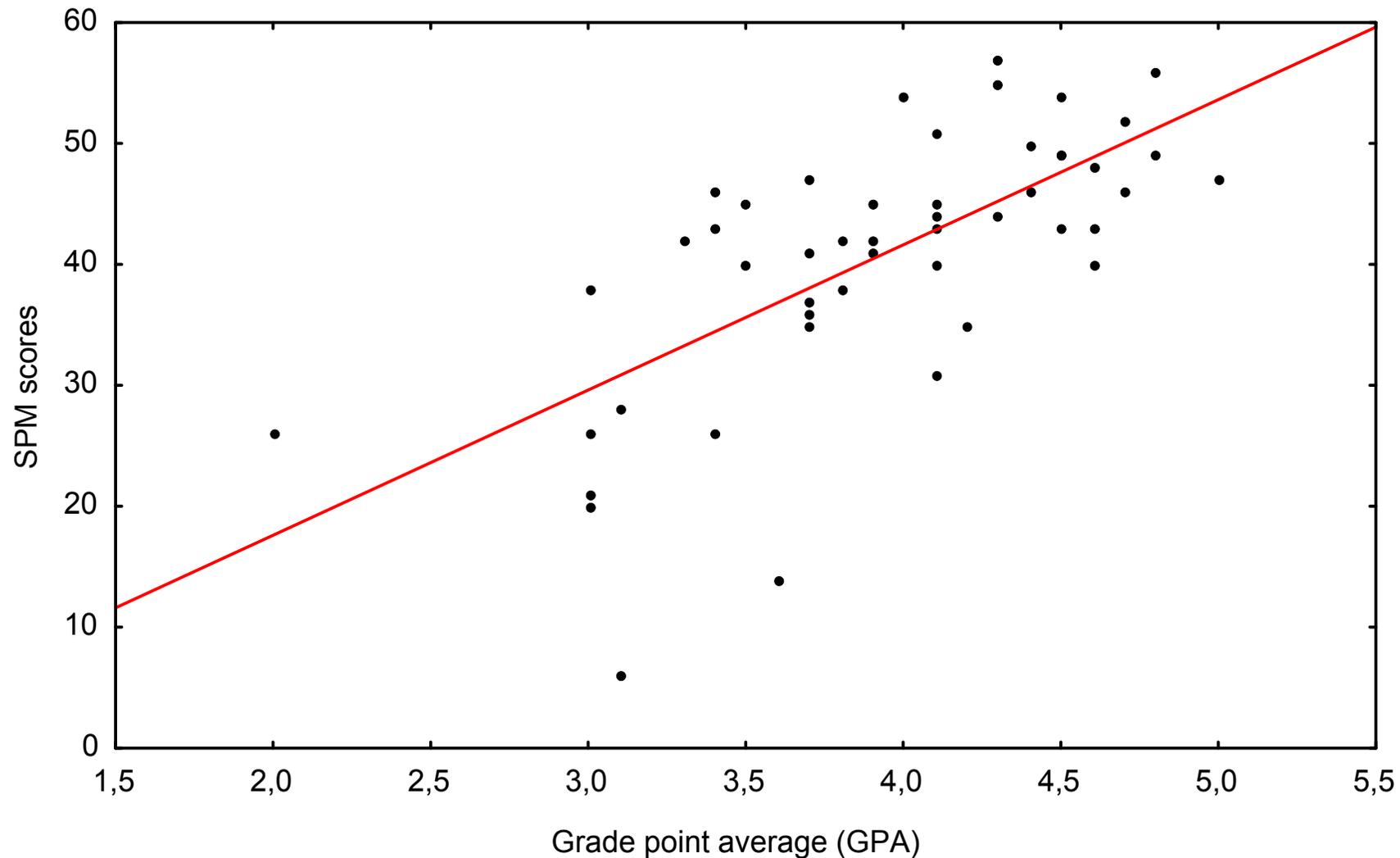
# Immaturity of Estonian offenders

- The immaturity-tendency
  - was observable in Estonian adults ( $r = 0.66$ )
  - somewhat lesser in Estonian and Russian minors ( $r = 0.43$ , and  $0.34$ )
  - not at all in Russian adults ( $r = -0.36$ )

# Variability among offenders

- Cognitive ability and personality traits did not predict most of the criteria very well:
  - Number of crimes committed
  - Disciplinary problems in prison
  - Age at first imprisonment
  - Total number of imprisonments
  - Total number of days spent in prison
  - The relationships were generally in the predicted direction but too weak to be statistically reliable
- Neither did background variables predict these criteria
  - Relationship quality with caregiver
  - Social economic status
  - School success (pre-prison)
  - Psychiatric diagnoses

# However, GPA in prison was strongly predicted by ability scores



$r = 0.68$

# Why?

- Normally IQ explains 25% of the variance in grades
- In prison it was 50%
- An explanation:
  - Curriculum is difficult for boys and managing with it depends heavily on cognitive ability; the curriculum might be inappropriate for many

# Personality matters as well

- Higher grades were also predicted by:
  - Low Neuroticism
  - High Openness, Agreeableness, and Conscientiousness
- Multiple regression:
  - Cognitive ability and personality (especially low Neuroticism) explained 55% of the variability in grades
- Good work!

# Conclusions (1)

- Self-report personality test can be used in prison, though they perform poorer than in general population
- The way incarcerated young males see their own personality traits is not how prison personnel see their traits
- The largest difference between offenders and non-offenders was in general cognitive ability
- Personality differences between offenders and non-offenders are small in magnitude but there may be a specific distinctive pattern of traits:
  - The predictive power of the distinctive pattern should be further investigated, it may prove useful for prognoses of future criminality

# Conclusions (2)

- Cognitive ability and personality traits strongly predict school performance in prison:
  - This may indicate relative difficulty of school curriculum – only able can manage; curriculum might be inappropriate for many
- Psychological traits are not powerful predictors of individual differences in criminal behaviour *within* offenders, nor have background variables more predictive power:
  - Offenders are all alike?
  - Perhaps, the relationships could be detected with statistical reliability in larger sample
  - But they might be too weak to have practical utility
- Perhaps we could go on:
  - Follow-ups
  - Extend data-sets