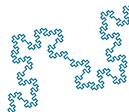


Personality and Intelligence

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INTRODUCTION

Introduction

Definitions

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Intelligence vs. Personality

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DEFINITIONS OF INTELLIGENCE I

- Consensus Definition (Gottfredson, 1997)

“Intelligence is a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. **It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather it reflects a broader and deeper capability for comprehending our surroundings – ‘catching on,’ ‘making sense’ of things, or ‘figuring out’ what to do.**”

DEFINITIONS OF INTELLIGENCE II

- ▶ Boring's Definition (Boring, 1923)

“[I]ntelligence as a measurable capacity must at the start be defined as the capacity to do well in an intelligence test. Intelligence is what the tests test.”

- ▶ Boring's Definition Misquoted (e.g., Legg & Hutter, 2007)

“Intelligence is what is measured by intelligence tests.”

STRUCTURE I

- ▶ Fluid – Crystallized Distinction (Cattell, 1941; Horn, 1965)
 - ▶ Fluid Intelligence
is the ability to think systematically and solve problems in novel situations.
 - ▶ Crystallized Intelligence
is the capacity to use reason, information, and experience. I like to think of it as “knowledge,” and that is the product of our accumulated experiences interacting with fluid intelligence.

STRUCTURE II

- ▶ Carroll Three-Stratum Theory (1993)
 - ▶ Hierarchical Structure
 1. narrow (70),
 2. broad (10), and
 3. general cognitive ability (1)

STRUCTURE III

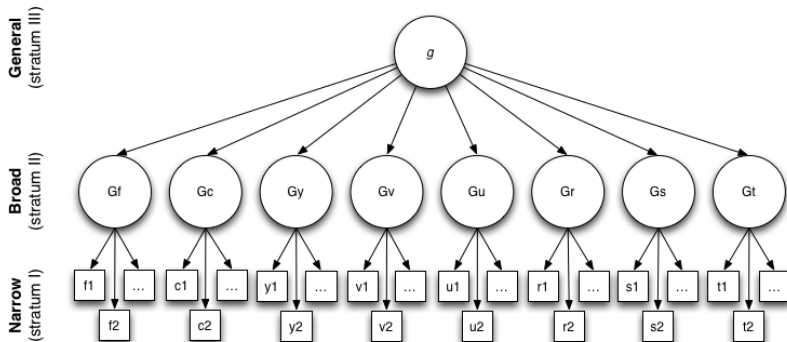


Image Source: Wikipedia.org

STRUCTURE IV

- ▶ Cattell-Horn-Carroll Theory
is the integration of Cattell and Horn's theory within Carroll's structural model. The broad abilities are:
 1. Crystallized Intelligence (Gc)
 2. Fluid Intelligence (Gf)
 3. Quantitative Reasoning (Gq)
 4. Reading Writing Ability (Grw)
 5. Short-Term Memory (Gsm)
 6. Long-Term Storage and Retrieval (Glr)
 7. Visual Processing (Gv)

STRUCTURE V

- 8. Auditory Processing (Ga)
- 9. Processing Speed (Gs)
- 10. Decision/Reaction Time/Speed (Gt)

STRUCTURE VI

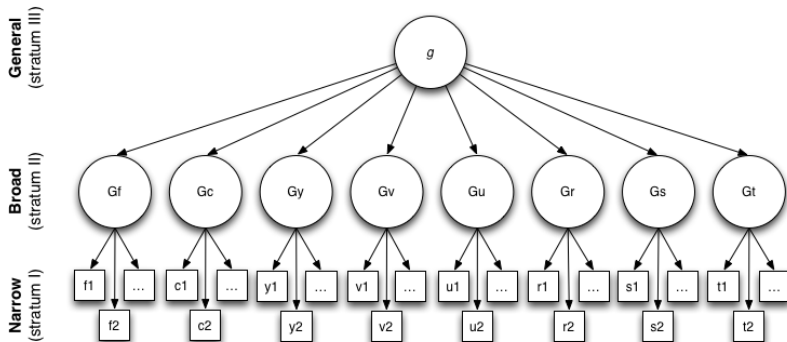


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WHY THE DISTINCTION?: INTELLIGENCE VS. PERSONALITY I

Three dichotomies seem to create the view that intelligence and personality are considered categorically distinct (DeYoung, 2011).

1. Cognitive and noncognitive traits

- ▶ Intelligence considered to be cognitive, and
- ▶ personality considered to be noncognitive.
- ▶ However, this is a very arbitrary distinction.
- ▶ Cognition is an essential part of personality.
- ▶ At present, all this distinction states is that Noncognitive traits are not intelligence. (DeYoung, 2011).

2. Methods of measurement:

- ▶ Intelligence is usually assessed using performance based “ability” tests, whereas
- ▶ personality is usually assessed by self report (or other report) “questionnaires”.

WHY THE DISTINCTION?: INTELLIGENCE VS. PERSONALITY II

3. Conceptual distinction in measurement

- ▶ Intelligence is often considered to reflect “maximal performance” (i.e., performance when individuals are trying their hardest), whereas
 - ▶ personality is considered to reflect “typical behavior”(Cronbach, 1949).
-
- ▶ These final two distinctions are a function of the method of assessment.
 - ▶ Noncognitive traits impact cognitive performance all the time.
 - ▶ Test Anxiety, Motivation, etc.
 - ▶ Duckworth and colleagues (2011) illustrated that incentivizing performance on IQ tests lead to a .66 SD score increase, or approximately 10 IQ points.

INTELLIGENCE WITHIN PERSONALITY THEORY I

- ▶ Eyesynck: PEN I
 - ▶ Intelligence and Personality are unrelated (Eysenck, 1994)
 - ▶ Orthogonal to Personality
- ▶ Big Five and the Lexical Hypothesis (Goldberg, 1990)
 - ▶ Is a fundamental piece of multiple factors
 - ▶ Primarily, Openness to Experience & Intellect (Saucier, 1992; Trapnell, 1994; McCrae, 1994)
intellectual, intelligent, philosophical, erudite, clever
 - ▶ But, pieces of conscientiousness are in there also (Mischel et al., 1989; Duckworth et al., 2011)
 - ▶ Some see it as a fundamental facet of intellect (DeYoung et al., 2007)

INTELLIGENCE AND CONSCIENTIOUSNESS I

It's wonderfully weird!

- ▶ Orthogonal (Ackerman & Heggestad, 1997)
- ▶ Positively Correlated (Kuntsi et al., 2004; Lynam et al., 1993)
- ▶ Negatively Correlated (Moutafi et al., 2004; Duckworth et al., 2011; Chamorro-Premuzic & Furnham, 2005)

INTELLIGENCE AND CONSCIENTIOUSNESS I

Stakes of Assessment explains the distinction.

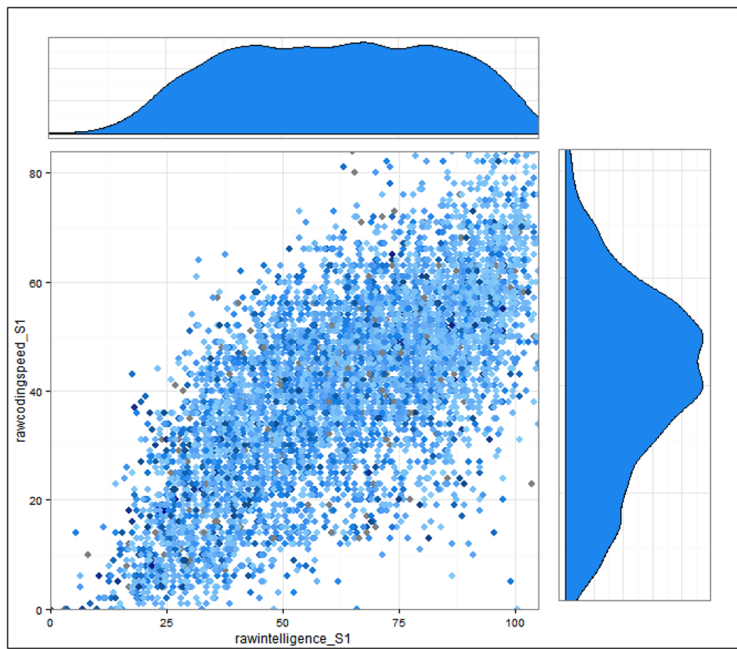
- ▶ Orthogonal in meta-analyses (they aggregate)
- ▶ Positively Correlated under low stakes testing (Goff & Ackerman, 1992)
- ▶ Negatively Correlated under high stakes testing (Moutafi et al., 2004; Duckworth et al., 2011)

APPLICATIONS TO HEALTH RESEARCH

- ▶ Conscientiousness and intelligence consistently predict later health outcomes (Jokela et al., 2013; Gottfredson & Deary, 2004), across the life course (Roberts et al., 2007).
- ▶ However, conscientiousness and intelligence are seldom tested simultaneously (Deary et al., 2010), making it difficult to determine whether both traits determine health or one measure is a proxy for the other.
- ▶ Intelligence and the conscientiousness facet of persistence are confounded under many assessment conditions (Duckworth et al., 2011; Segal, 2012).
- ▶ Moreover, persistence is associated with later health (Torres & Solberg, 2001), making the persistence-intelligence confound even more difficult to untangle.

DATA

- ▶ National Longitudinal Survey of Youth 1979
- ▶ In 1980, 12,686 adolescents between the ages of 14 and 22 were surveyed on a battery of measures, including the Armed Forces Vocational Aptitude Battery (ASVAB).
 - ▶ Subscales of the ASVAB measure intelligence (AFQT) and
 - ▶ persistence (Coding Speed).
- ▶ Outcome Measures
 - ▶ Health: **40+** Health Module
 - ▶ Focus on two items in particular
 - ▶ Self-assessed health: “In general, would you say your health is...
 - ▶ Excellent / Very Good / Good / Fair / Poor?”



METHODS I

To control for gene and environmental confounds, we (2014) have adapted Kenny's (2006) reciprocal standard dyad model. The adaptation controls for gene and shared environmental influences within a simple regression framework, by taking the difference between the two siblings:

$$Y_{diff} = \beta_0 + \beta_1 \bar{Y} + \beta_2 \bar{X} + \beta_3 X_{diff}$$

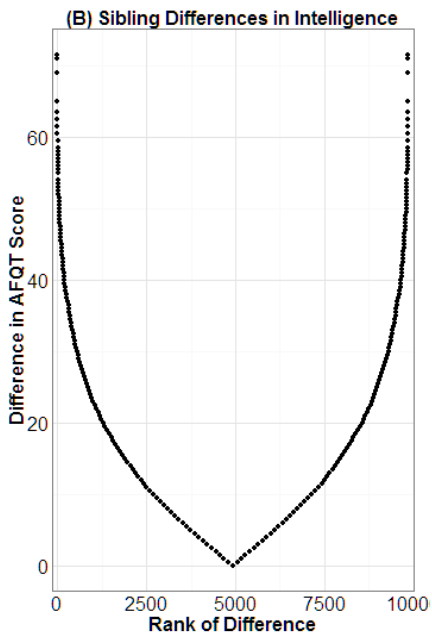
where,

$$Y_{diff} = Y_{1i} - Y_{2i}; \bar{Y} = \frac{Y_{1i} + Y_{2i}}{2}$$

$$X_{diff} = X_{1i} - X_{2i}; \bar{X} = \frac{X_{1i} + X_{2i}}{2}$$

METHODS II

- ▶ The relative difference in outcomes (Y_{diff}) is predicted from
 - ▶ the mean level of the outcome (\bar{Y}),
 - ▶ the mean level of the predictor (\bar{X}), and the
 - ▶ between-sibling predictor difference (X_{diff}).
- ▶ The mean levels support causal inference through at least a partial control for genes and shared environment.
- ▶ Therefore, we simultaneously evaluate the individual difference (X_{diff}) and the joint contribution of genes and shared environment (\bar{Y} & \bar{X}).



DIFFERENCES IN HEALTH

	(1)	(2)	
Individual			
Persistence	-0.099* (0.024)	-0.059* (0.014)	-0.0
Intelligence	-0.095* (0.024)	-0.037* (0.014)	-0.03
Family			
Persistence	-0.053* (0.017)	-0.043* (0.013)	-0.05
Intelligence	-0.027(0.017)	0.014(0.013)	0.0
Health	0.155* (0.014)	0.155* (0.014)	0.15
Observations	4,268	4,268	
Adjusted R ²	0.042	0.042	
F Statistic	38.665* (df = 5; 4262)	38.665* (df = 5; 4262)	38.665*

DISCUSSION POINTS

- ▶ Why do you think intelligence and personality are treated as distinct categories?
- ▶ How could we assess personality traits as abilities?
- ▶ What about intelligence as we do personality?
- ▶ Why don't we include more intelligence measures in personality research?

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