



Cognition: Methods and Models

PSYC 2040

L3: Eugenics, psychology, &
intelligence testing

Part 2



logistics: Qs about milestone #1?

recap: Feb 7, 2023



- what we covered:
 - L3: The eugenics movement
 - psychology and eugenics
 - project milestones overview + planning
- your to-dos were:
 - *complete*: L3 (Eugenics + Intelligence Testing chapters)
 - *post*: L3 conceptual question
 - *redo*: L2 quiz (if you'd like to)
 - *schedule meeting with project partner*: project milestone #1
 - *look at*: L3 writing assignments (added a third option this morning, FYI)

today's agenda

- intelligence overview
- intelligence tests around the world
- problems and consequences
- intelligence today

conceptual questions #intelligence

Is there a precise, agreed-upon definition of the word "intelligence" within psychology? Many of the scientists discussed in this module set out with the same intention of devising intelligence tests, but what they tested and how they did so varied greatly. For instance, while Binet and others focused on measuring mental abilities, Cattell measured physical abilities as well.

I read an article titled "A Collection of Definitions of Intelligence" in the publication *Frontiers in Artificial Intelligence and Applications* which addressed that intelligence can be more broadly defined, but in psychology (and in general) **there is no one definition agreed upon**. Something interesting to me was how the article was broken up: collective definitions, psychologist definitions, and AI researcher definitions. Each section had a very large collection of definitions, all with some common themes, but it's definitely interesting to put that into perspective of Binet and Cattell's tests, as well as the eugenics movement as a whole. I hope that somewhat addresses your question, I definitely only touched the surface!

I believe that **there isn't a single agreed-upon definition of the word "intelligence" within psychology** as there are many different types of intelligence such as IQ and emotional intelligence. I think that it is difficult to have only one definition of intelligence due to the idea that there are many types.

Why are we so intent on ascribing measures to human intelligence? Many tests which attempt to quantify the vague variable have been criticized for test bias; **I wonder if the problem is the test itself or the definition of intelligence it is working with.** If not intelligence, what do these tests measure?

how would you define intelligence?

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many researchers, many definitions

Researcher	Quotation
Alfred Binet	Judgment, otherwise called "good sense", "practical sense", "initiative", the faculty of adapting one's self to circumstances ... auto-critique. ^[11]
David Wechsler	The aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment. ^[12]
Lloyd Humphreys	"...the resultant of the process of acquiring, storing in memory, retrieving, combining, comparing, and using in new contexts information and conceptual skills". ^[13]
Howard Gardner	To my mind, a human intellectual competence must entail a set of skills of problem solving — enabling the individual to resolve genuine problems or difficulties that he or she encounters and, when appropriate, to create an effective product — and must also entail the potential for finding or creating problems — and thereby laying the groundwork for the acquisition of new knowledge. ^[14]
Linda Gottfredson	The ability to deal with cognitive complexity. ^[15]
Robert Sternberg & William Salter	Goal-directed adaptive behavior. ^[16]
Scott Barry Kaufman	"The dynamic interplay of ability and engagement in pursuit of personal goals." ^[17]
Reuven Feuerstein	The theory of Structural Cognitive Modifiability describes intelligence as "the unique propensity of human beings to change or modify the structure of their cognitive functioning to adapt to the changing demands of a life situation". ^[18]
Shane Legg & Marcus Hutter	A synthesis of 70+ definitions from psychology, philosophy, and AI researchers: "Intelligence measures an agent's ability to achieve goals in a wide range of environments", ^[7] which has been mathematically formalized. ^[19]
Alexander Wissner-Gross	$F = T \nabla S_\tau$ ^[20] "Intelligence is a force, F, that acts so as to maximize future freedom of action. It acts to maximize future freedom of action, or keep options open, with some strength T, with the diversity of possible accessible futures, S, up to some future time horizon, τ . In short, intelligence doesn't like to get trapped".

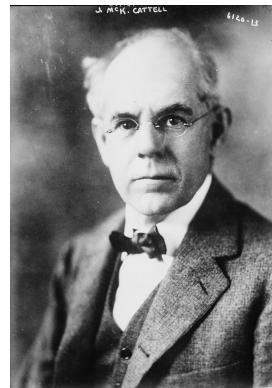
cognition vs. intelligence?

- cognition refers to the **baseline**
“processes by which sensory input is transformed, reduced, elaborated, stored, recovered, and used”
- the notion of intelligence has more heavily focused on where people lie on this **spectrum** and **how well** you can perform cognitive tasks



Galton to Cattell

- James Cattell published “Mental tests and measurements” in 1890
- influenced by **Galton’s ideas** and the **eugenics** movement
- proposed obtaining a **variety of measurements** from individuals
- several of these were **physical measurements** that Cattell thought reflected some aspect of intelligence



The following ten tests are proposed :

- I. Dynamometer Pressure.
- II. Rate of Movement.
- III. Sensation-areas.
- IV. Pressure causing Pain.
- V. Least noticeable difference in Weight.
- VI. Reaction-time for Sound.
- VII. Time for naming Colours.
- VIII. Bi-section of a 50 cm. line.
- IX. Judgment of 10 seconds time.
- X. Number of Letters remembered on once Hearing.

activity: let's do some of Cattell's tests!

- each of you are assigned a **group number**
 - **experimenter**: whoever's birthday is earlier in the year
 - **participant**: whoever's birthday is later in the year
- **experimenters** from each group will open [this google document](#) (also on Canvas: L3)
 - read the instructions for your group, administer and score the test
- **participants** from each group will follow the experimenter's instructions
- after the test:
 - **experimenter**: what did you think about the **scoring/test**, does it reflect any aspect of intelligence?
 - **participant**: how did it **feel** to take the test, did you think your intelligence was being tested?

Cattell's mental tests

- several of Cattell's tests were about **physical** attributes (vision, touch, etc.)
- the ones you did today (mostly **mental**):
 - reaction time (processing speed: intelligence)
 - spatial perception (judgment of line orientation: neuropsychological testing)
 - time perception
 - read aloud paragraph (memory testing, RBANS, Wechsler Memory Scales)
 - read aloud numerals (working memory, also tested backwards)
 - color preference

	Time in Secs.		
	Av.	v.	V.
Marking 100 letters	95.0	12.8	6.4

	Error in mm.		
	Av.	v.	V.
Average Error,	6.5	3.4	0.9

	Time in Sec.		
	Av.	v.	V.
Average Errors,	1.57	0.81	0.26

Blue, 34.9 %; red, 22.7; violet, 12.1; yellow, 7.5;
green, 6.1; white, 6.1; no preference, 10.6.

Cattell's mental tests at Columbia

- Cattell tested 100 students at **Columbia university** and published the results in 1896 on a whole host of measures
- Although the hope was these measurements would correlate with grades, there was **no consistent relationship between test performance and student grades**

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J. MCK. CATTELL AND L. FARRAND.

Laboratory of Psychology of Columbia College,
PHYSICAL AND MENTAL TESTS.

Name.....	Date of Birth.....
Birthplace.....	of father..... of mother.....
Class.....	Profession of father.....
Color of eyes.....	of hair.....
Perception of size.....	Memory for size.....
Height.....	Weight.....
Breathing capacity { 1..... 2.....}	Size of head..... Right handed?.....
Strength of hand, right { 1..... 2.....}	Left { 1..... 2.....}
Keenness of sight, right eye.....	Left.....
Keenness of hearing, right ear.....	Left.....
Reaction-time { 1..... 2..... 3..... 4..... 5..... Av.	
After-Images.....	
Color vision.....	Perception of pitch.....
Perception of weight 1..... 2..... 3.....	Sensation areas 1..... 2..... 3..... 4..... 5.....
Sensitiveness to pain { right hand left hand	Preference for color.....
1..... 2..... 3.....	
Perception of time.....	
Accuracy of movement.....	Rate of perception and movement.....
Memory.....	
Imagery.....	
Are you willing to repeat these tests at the end of the Sophomore and Senior years?.....	Do you wish to have a copy of these tests sent you?.....
Date of measurement	Recorded by

conceptual question #confusion?

It is interesting to see how the difference of opinion on what the schooling of "defective" children should be and if intelligence was fixed/inherited or if it could be improved with development. **For those that thought intelligence could be improved, how could they be supportive/complacent of people being institutionalized or segregated?** I would assume those people would be the biggest proponents for education of "defective" people, especially children, and would argue for development of specialized education models.

Galton was worried about "high-quality" populations being overpowered by "low-quality" humans responding. However, he also believed in survival of the fittest (high-quality humans). **Shouldn't he have had no worry that if the people he defined as quality are the fittest, they would survive?** Maybe I'm misunderstanding the concept of survival of the fittest.

Alfred Binet

- Binet was a French psychologist also interested in developing intelligence tests
- he **criticized Cattell's tests** on face-validity and came up with his own set of tests that were arguably **more challenging**
- was motivated by **the unfair institutionalization practices** of the French government for children



Binet-Simon test

- the tests measured a whole host of abilities across different ages
- Binet equated mental ability with age and assumed that intelligence grew with age linearly
- came up with an algorithm to compute “mental age” based on number of tests passed for that age

Three years	
Show eyes, nose, mouth (p. 184).	
Name objects in a picture (p. 188).	
Repeat 2 figures (p. 187).	
Repeat a sentence of 6 syllables (p. 186).	
Give last name (p. 194).	
Four years	
Give sex (p. 195).	
Name key, knife, penny (p. 195).	
Repeat 3 figures (p. 196).	
Compare 2 lines (p. 196).	
Five years	
Compare 2 boxes of different weights (p. 196).	
Copy a square (p. 198).	
Repeat a sentence of 10 syllables (p. 186).	
Count 4 sous (p. 200).	
Put together two pieces in a “game of patience” (p. 198).	
Six years	
Repeat a sentence of 16 syllables (p. 186).	
Compare two figures from an esthetic point of view (p. 202).	
Define by use only, some simple objects (p. 202).	
Execute 3 simultaneous commissions (p. 205).	
Give one's age (p. 206).	
Distinguish morning and evening (p. 206).	
Seven years	
Indicate omissions in drawings (p. 207).	
Give the number of fingers (p. 209).	
Copy a written sentence (p. 209).	
Copy a triangle and a diamond (p. 209).	
Repeat 5 figures (p. 210).	
Describe a picture (p. 210).	
Count 13 single sous (p. 210).	
Name 4 pieces of money (p. 211).	
Eight years	
Read selection and retain two memories (p. 211).	
Count 9 sous. (3 single and 3 double) (p. 214).	
Name four colors (p. 215).	
Count backward from 20-0 (p. 215).	
Compare 2 objects from memory (p. 216).	
Write from dictation (p. 216).	
Nine years	
Give the date complete (day, month, day of the month, year) (p. 217).	
Name the days of the week (p. 218).	
Give definitions superior to use (p. 205).	
Retain 6 memories after reading (p. 220).	
Make change, 4 sous from 20 sous (p. 218).	
Arrange 5 weights in order (p. 220).	
Ten years	
Name the months (p. 221).	
Name 9 pieces of money (p. 221).	
Place 3 words in 2 sentences (p. 222).	
Answer 3 comprehension questions (p. 224).	

DIFFERENT TESTS	AGE OF THE CHILDREN				
	7 years	8 years	9 years	10 years	12 years
<i>see text.</i>					
Right hand, left ear.....	12	4			
Compare 2 faces.....	13	6			
Define by use.....	24	2			
Execute 3 commissions.....	20	6			
Distinguish morning and evening.....	16	3			
<i>Six years</i>					
Right hand, left ear.....	12	4			
Compare 2 faces.....	13	6			
Define by use.....	24	2			
Execute 3 commissions.....	20	6			
Distinguish morning and evening.....	16	3			
<i>Seven years</i>					
Indicate omission in picture.....	10	10	7	2	
Copy a diamond.....	22	7	10	0	
Repeat 5 digits.....	15	15	5	5	
Describe a picture.....	23	7	13	2	
Count 13 single sous.....	23	5	9	1	
<i>Eight years</i>					
Count 3 single and 3 double sous.....	17	7	37	6	18
Name 4 colors.....	15	10	38	4	119
Count from 20 to 0.....	12	13	36	7	27
Compare 2 objects from memory.....	18	6	134	9	17
Suggestion of lines.....					1
<i>Nine years</i>					
Give the date.....	20	0	13	5	35
Define better than by use.....	10	10	18	21	137
Give change from 20 sous.....	3	16	17	23	46
Place 5 weights in order.....	5	11	11	29	27
Copy a design from memory.....					22
<i>Ten years</i>					
Name the months.....			38	11	44
9 pieces of money.....			40	6	41
Put 3 words into 2 sentences.....			12	33	50
Comprehend 3 easy questions.....			40	9	141
Comprehend 5 difficult questions.....			10	37	314
			32	22	7
					2

Binet-Simon test correlations

- Binet recognized that a single test did not mean anything, but believed that the collection of them could represent something meaningful
- Binet also proposed the idea of norms/standardization, i.e., building a pattern from a large database and then comparing individuals on that pattern
- strengths/limitations?

TABLE IV
This table shows the relation between the intellectual level and the scholastic level

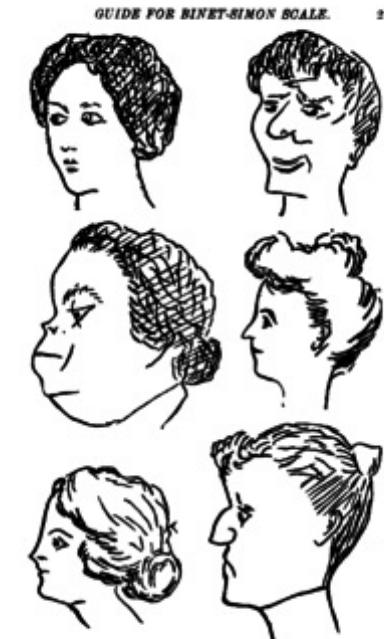
	CHILDREN BEHIND IN SCHOOL INSTRUCTION	CHILDREN REGULAR IN SCHOOL INSTRUCTION	CHILDREN ADVANCED IN SCHOOL INSTRUCTION
Intelligence above the average.....	1	16	7
Average intelligence.....	9	33	5
Intelligence below the average.....	14	16	0

One test signifies nothing, let us emphatically repeat, but five or six tests signify something. And that is so true that one might almost say, 'It matters very little what the tests are so long as they are numerous

modern IQ tests

- Binet's tests were linked to “mental age” based on a **standardized scale**
- modern “intelligence tests” also use a standardized scale called the **intelligence quotient (IQ)**
- Binet's tests were popularized by American psychologists to further the eugenics cause

22. Show the pretty and ugly faces in pairs. “Which of these two faces is the prettier (or uglier)?” Or: “Which is the good looking one?” 1 2 3 All three must be correct. Both are pretty = —.



THE PERTINENCIAS CHART is intended for the use of three rats and three children. It is the property of Dr. Robert F. Cattell, Director of the Institute of Personality and Ability测验, and Chairman of Committee on Standardization of Psychological Tests and Measures. The rights of publication, Oct. 21, 1930, are reserved.

Lewis Terman and IQ tests

- American psychologist at Stanford University, eugenicist leader and APA president (1923)
- Popularized the Binet-Simon test in the US as the **Stanford-Binet test** (1916)



eugenics and intelligence tests

- Terman was motivated by **eugenicist** ideas
- There were also concerns about “superior” or “fit” people being killed in the war
- psychologist Robert Yerkes created the **Alpha-Beta tests** for mass testing Americans (1923)
- **Henry Goddard** further popularized this ideology via “Who is a moron?” (1927)

First of all, some of my readers have already raised the question as to the advisability of letting these people go out into the world, even though they can support themselves. Is there not danger that they will marry and bring into the world feeble-minded children and so continue this defective race? Yes, there is considerable danger of that, *if it is a danger*. Let us look at it a little more closely. Just what is the danger? First, that we are propagating the feeble-minded. Yes, but we have learned how to “cure” them, and when cured (trained) they are very useful. They are happy in doing their kind of work that you and I do not want to do—positions that it is hard to get people to fill. In other words, *we need these people.*

criticisms #1

- Hilliard, A. G. (1976). A Review of Leon Kamin's *The Science and Politics of I.Q.* *Journal of Black Psychology*, 2(2), 64–74.
<https://doi.org/10/gg3hr5>
- formation of Association of Black Psychologists (ABPsi) in 1978

In short *The Science and Politics of I.Q.* is not only a sufficient rebuttal to racist behavioral science, it is as well a study in the psychology, sociology and politics of behavioral science itself. Kamin's conclusion is bold:

"There exists no data which should lead a prudent man to accept the hypothesis that I.Q. test scores are in any degree heritable . . . The I.Q. test in America, and the way in which we think about it, has been fostered by men committed to a particular social view. That view includes the belief that those on the bottom are genetically inferior victims of their own immutable defects. The consequences has been that the I.Q. test has served as an instrument against the poor-dressed in the trappings of science rather than politics." (pp. 1 & 2)

A History of The Association of Black Psychologists: Early Formation and Development

Robert Williams
Washington University

*Men do not build for others, they build for themselves . . .
What are you going to expect, that white men are going to build up America and elsewhere and hand it over to us?"*

Marcus Garvey
August 1, 1924

It is not an accident that the National Association of Black Psychologists was formed in San Francisco in 1968. The seeds of discontent had been sown. Specifically, the assassination of Dr. Martin Luther King, Jr. and the proliferation of Black caucuses—the former representing the end of a dream, the latter heralding an era of new hope—were directly correlated with the formation of ABPsi. Except for one or two well-known individuals (e.g. Dr. Kenneth B. Clark and Dr. Martin Jenkins), Black psychologists were virtually unknown prior to 1968. Typically at the annual meetings of the American Psychological Association, Black Psychologists ignored other Blacks. It was rare to see more than two Black people together at a time during an APA meeting. Eye-to-eye contacts and conversations were avoided. Black psychologists were as separate as the fingers are on the hand.

criticisms #2

The Pseudoscience of Psychometry and The Bell Curve

Joseph L. Graves, Jr., Department of Life Sciences, Arizona State University-West; and Amanda Johnson, Arizona State University Honors College*

This article claims The Bell Curve merely reiterates the fallacious argument long embraced by psychometricians: that intelligence can be reduced to a single ordinal measure (g) that is the primary factor for determining group or individual social-class status. The book's policy recommendations, particularly its call to dismantle initiatives designed to ameliorate social inequality, are shown to have evolved from pseudoscientific theories about the distribution of cognitive abilities across racial/ethnic groups. Evidence from the biological sciences and quantitative genetics is presented, pointing to the significance of environmental and physiological factors neglected by the psychometric program. These data reveal that social inequality is not a symptom of immutable biological inequalities but rather the result of longstanding biases and differential opportunity structures.

A Legacy of Eugenics Underlies Racial-Group Comparisons in Intelligence Testing

JANET E. HELMS
Boston College

What Happened to ABPsi's Moratorium on Testing: A 1968 to 1977 Reminder

by

**Robert L. Williams and Horace Mitchell
of
Washington University at St. Louis**

"When the cock is asleep, he forgets about the hawk"
An Ashanti Proverb

"Sleep is the cousin of death" from Zaire

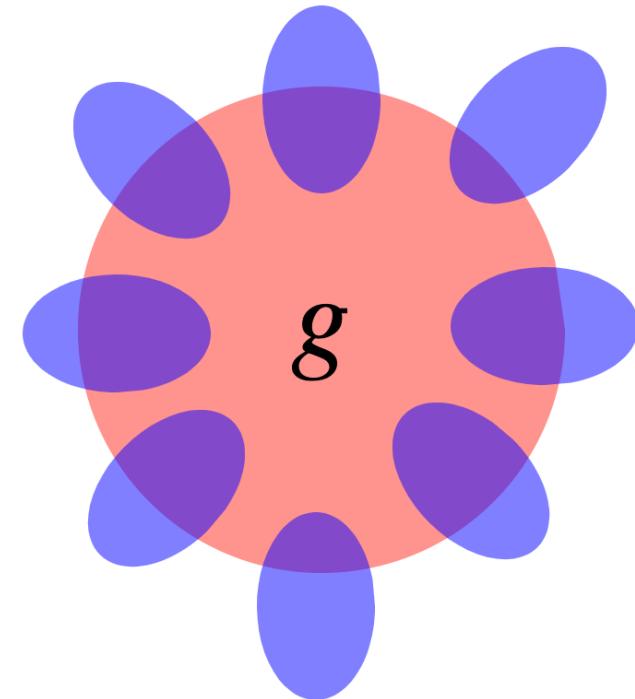
In 1968 at its National meeting the Association of Black Psychologists issued a call for a moratorium on all standardized testing of Black students. The charges were "cultural bias", "racism" "unfairness" and even "black intellectual genocide". Indeed, the initial call for a testing moratorium jolted the testing world. The moratorium touched off a furor between staunch advocates of standardized testing (Cleary, et. al., 1975 APA 1976(b), APGA, 1970, A.M.E.G. et.al., 1972 to name a few) and its opponents (Williams, 1970a, 1972a; Barnes, 1972; Green, 1974; Rivers, Mitchell and Williams, 1975; Williams and Rivers, 1975 and Stone 1975).

IQ tests today

- Stanford-Binet: has not been updated for a while
- more commonly used:
 - Wechsler Intelligence Scale for Children (WISC, 6-16)
 - WAIS (16-90), WPPSI (preschool and primary scale of intelligence; 2y6mo – 7y7mo)
- used in schools to determine **learning/intellectual disabilities** or **gifted** students
- get a **baseline** of expected performance on other tests (lower the bar)
- despite the assumption that IQ tests measure “unbiased” intelligence, these tests are **biased and subjective**
- IQ tests have a long and **complicated legal history** as well

g-factor

- Charles Spearman proposed the idea of “**general** intelligence”, after observing **high correlations between unrelated tasks** administered to children
- **two-factor** model: **general** (*g*) and **specific abilities** (*s_i*)



the controversial *g*

Predicting Pilot and Navigator Criteria: Not Much More Than *g*

Michele Morales Olea and Malcolm James Ree

A comparison of the validity of psychometric *g* and specific ability or job knowledge, *s*, for predicting pilot and navigator criteria was conducted. Psychometric *g* and *s* were estimated from the principal components of a multiple aptitude test battery. The criteria included passing-failing training, an overall performance composite, academic performance, and work samples of pilot and navigator tasks. Regression analyses conducted to evaluate the predictive efficiency of *g* and *s* demonstrated that *g* was the best predictor of all criteria and *s* contributed little beyond *g*.

PREDICTING TRAINING SUCCESS: NOT MUCH MORE THAN *g*

MALCOLM JAMES REE, JAMES A. EARLES
Armstrong Laboratory
United States Air Force

The roles of general ability (*g*) and specific abilities ($s_1 \dots s_9$) were investigated in prediction of job-training-school grades. Subjects were 78,041 Air Force enlistees in 82 jobs. General ability and specific abilities were defined by scores on the first and subsequent unrotated principal components of the enlistment selection and classification test, the Armed Services Vocational Aptitude Battery. Linear models analyses revealed that $s_1 \dots s_9$ added little to the prediction afforded by *g*. It was also determined that a common prediction equation for all jobs was almost as predictive as an equation for each job.

Predicting Job Performance: Not Much More Than *g*

Malcolm James Ree, James A. Earles, and Mark S. Teachout

The roles of general cognitive ability (*g*) and specific abilities or knowledge (*s*) were investigated as predictors of work sample job performance criteria in 7 jobs for U.S. Air Force enlistees. Both *g* and *s* (the interaction of general ability and experience) were defined by scores on the first and subsequent principal components of the enlistment selection and classification test (the Armed Services Vocational Aptitude Battery). Multiple regression analyses, when corrected for range restriction, revealed that *g* was the best predictor of all criteria and that *s* added a statistically significant but practically small amount to predictive efficiency. These results are consistent with those of previous studies, most notably Army Project A (J. J. McHenry, L. M. Hough, J. L. Toquam, M. A. Hanson, & S. Ashworth, 1990). The study also extends the findings to other jobs and uses traditionally more acceptable estimates of *g*, application of effective sample size in cross-validation estimation, and new performance criteria.

Expanding the frontier of human cognitive abilities: so much more than (plain) *g*!

David B. Bowman, Pippa M. Markham, Richard D. Roberts*

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Survey of opinions on the primacy of *g* and social consequences of ability testing: A comparison of expert and non-expert views[☆]

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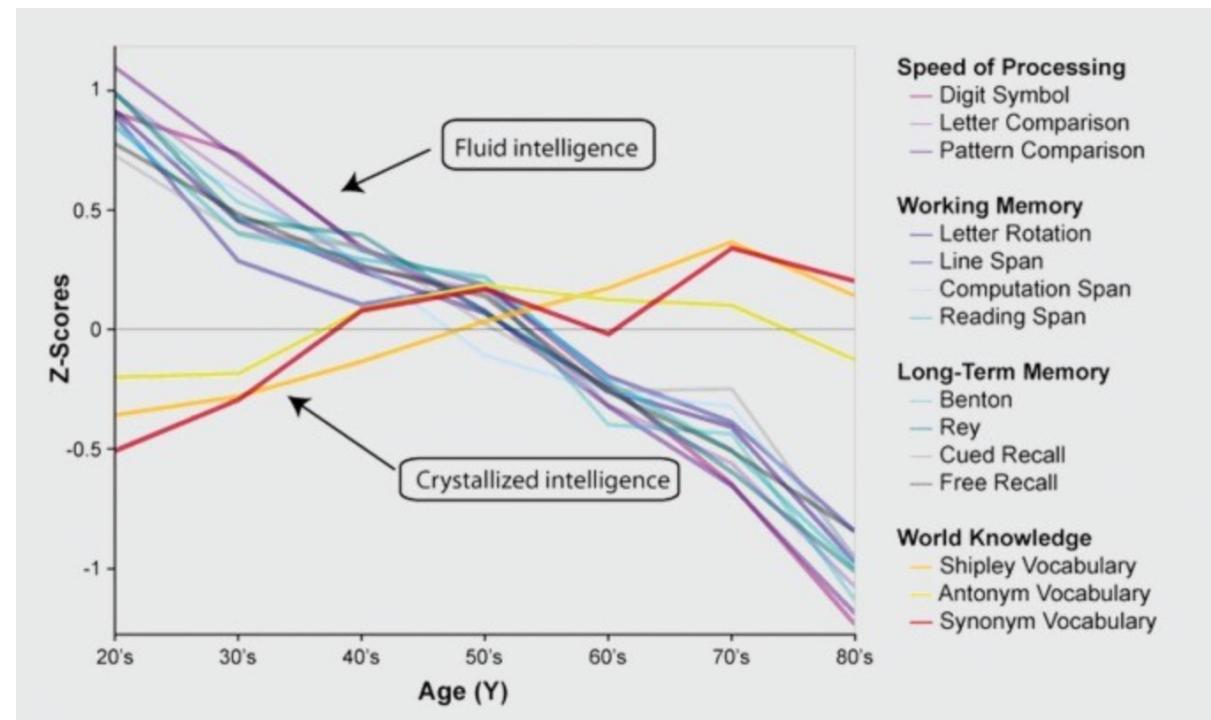
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Intelligence
Ability testing
Expert opinion

ABSTRACT

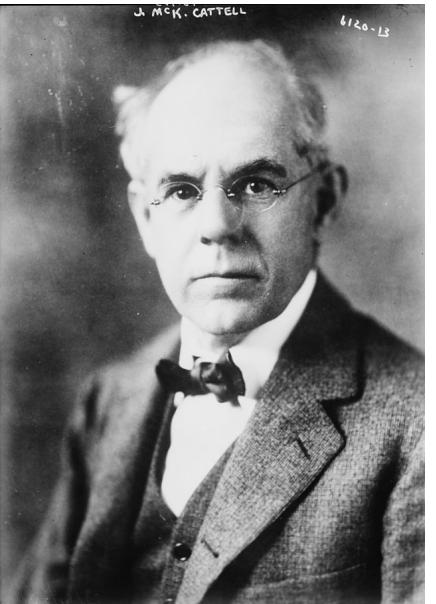
The current study examines the views of experts in the science of mental abilities about the primacy and uniqueness of *g* and the social implications of ability testing, and compares their responses to the views of a group of non-expert psychologists. Results indicate expert consensus that *g* is an important, non-trivial determinant (or at least predictor) of important real world outcomes for which there is no substitute, and that tests of *g* are valid and generally free from racial bias. Experts did not reach consensus on issues such as the degree to which specific abilities or combinations of non-cognitive traits can yield predictive validities comparable to that of *g* alone, the predictive validity of *g* for non-technical work outcomes (e.g., contextual performance), and the nature and implications of race differences in intelligence. Second, a comparison of responses from experts and a group of applied psychologists reveals several discrepant beliefs between these groups, primarily dealing with the primacy of *g*, susceptibility of ability tests to racial bias, and the potential value of ability testing. Results are discussed in terms of directions for future research and shared responsibility for various groups of researchers to enhance dissemination of research to relevant audiences.

fluid and crystallized intelligence

- Raymond Cattell proposed dividing g into two **independent** constructs: crystallized and fluid intelligence
 - fluid**: basic reasoning, less reliant on prior knowledge
 - crystallized**: learned knowledge
- the main motivation for thinking about intelligence through this lens was due to observations of how some **abilities declined** over time, while others remained relatively **stable**

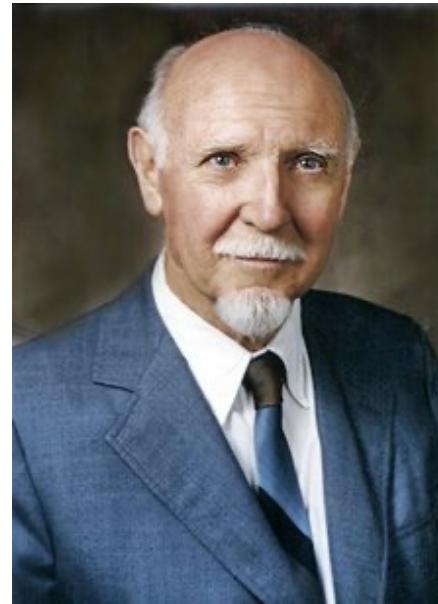


Cattell Confusion



James Cattell came up with early physical and mental tests to measure intelligence

performance on his tests did not correlate with student performance



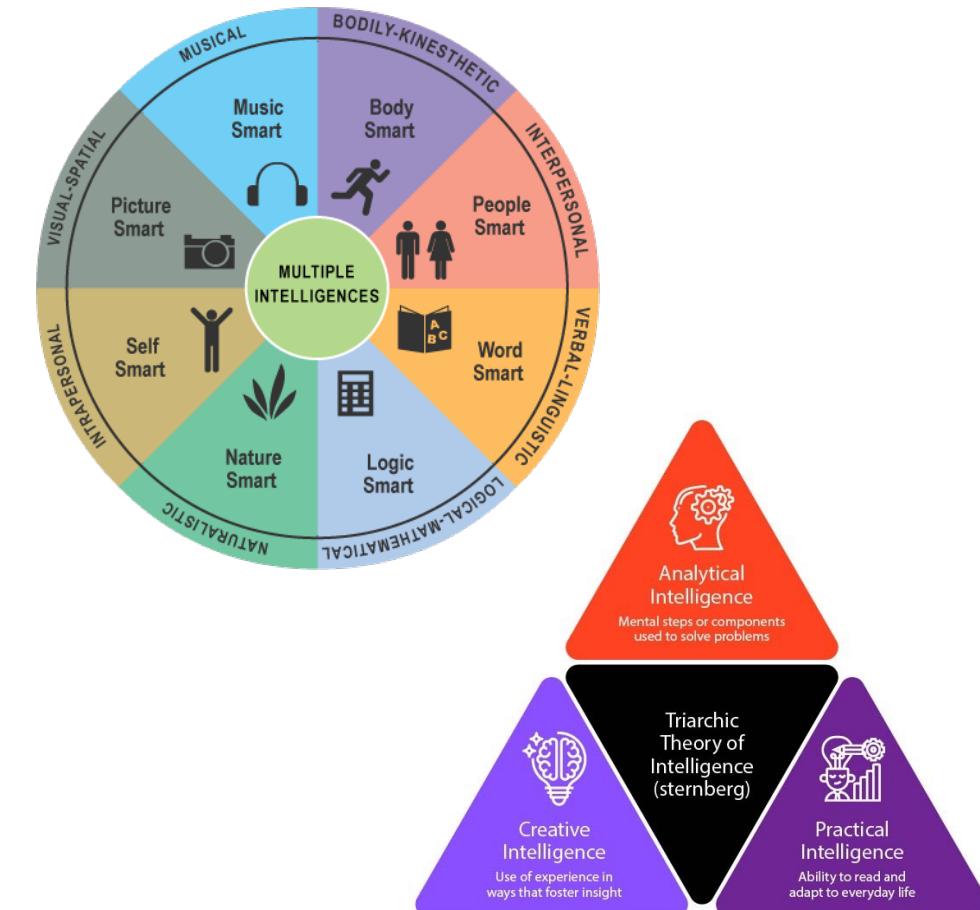
Raymond Cattell proposed the fluid/crystallized intelligence dichotomy

these ideas still persist in psychological research

prominent leader in factor analysis

other prominent definitions/ideas

- Howard Gardner's **8 intelligences**
- Robert Sternberg's triarchic theory of intelligence



modern conversations on intelligence

- intelligence continues to remain a **popular** and **scientifically important** topic in the field but the goals have evolved over time
- intelligence is thought to be **multifaceted**, and the study of intelligence has many different **motivations** and **goals**
 - what makes humans **different/unique?**
 - how can we build **artificial intelligence?**

A Theory of Adaptive Intelligence and Its Relation to General Intelligence

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Abstract: Intelligence typically is defined as consisting of “adaptation to the environment” or in related terms. Yet, it is not clear that “general intelligence” or *g*, traditionally conceptualized in terms of a general factor in a psychometrically-based hierarchical model of intelligence, provides an optimal way of defining intelligence as adaptation to the environment. Such a definition of adaptive intelligence would need to be biologically based in terms of evolutionary theory, would need to take into account the cultural context of adaptation, and would need to take into account whether thought and behavior labeled as “adaptively intelligent” actually contributed to the perpetuation of the human and other species, or whether it was indifferent or actually destructive to this perpetuation. In this article, I consider the similarities and differences between “general intelligence” and “adaptive intelligence,” as well as the implications especially of the differences.

Keywords: intelligence; general intelligence; adaptive intelligence; analytical thinking; creative thinking; practical thinking; wisdom

Building machines that learn and think like people

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conceptual question #smartness

In my Education course work, we talk a lot about the idea of "smartness" and how it can be harmful to a lot of students. Who tends to be labeled as "smart"? By what measures are they deemed so, and what sorts of skills do those measures privilege? Who is systematically left out? Being deemed "not smart" by class tracking or test scores can decrease students' motivation to learn, and being deemed "smart" can put constant pressure on students to continuously perform. Reading this history of intelligence testing, it is evident how the tie between being smart and doing well on tests was born out of a desire to operationally define intelligence. How do we unlink intelligence from testing? And how can Psychology as a discipline continue to study these cognitive phenomena without inherently privileging certain learners?

idea of genius/brilliance/smartness

WOMEN IN SCIENCE

Expectations of brilliance underlie gender distributions across academic disciplines

Sarah-Jane Leslie,^{1,*†} Andrei Cimpian,^{2,*†} Meredith Meyer,³ Edward Freeland⁴

The gender imbalance in STEM subjects dominates current debates about women's underrepresentation in academia. However, women are well represented at the Ph.D. level in some sciences and poorly represented in some humanities (e.g., in 2011, 54% of U.S. Ph.D.'s in molecular biology were women versus only 31% in philosophy). We hypothesize that, across the academic spectrum, women are underrepresented in fields whose practitioners believe that raw, innate talent is the main requirement for success, because women are stereotyped as not possessing such talent. This hypothesis extends to African Americans' underrepresentation as well, as this group is subject to similar stereotypes. Results from a nationwide survey of academics support our hypothesis (termed the field-specific ability beliefs hypothesis) over three competing hypotheses.

Gender stereotypes about intellectual ability emerge early and influence children's interests

Lin Bian,^{1,2,*} Sarah-Jane Leslie,³ Andrei Cimpian^{1,2,*}

Common stereotypes associate high-level intellectual ability (brilliance, genius, etc.) with men more than women. These stereotypes discourage women's pursuit of many prestigious careers; that is, women are underrepresented in fields whose members cherish brilliance (such as physics and philosophy). Here we show that these stereotypes are endorsed by, and influence the interests of, children as young as 6. Specifically, 6-year-old girls are less likely than boys to believe that members of their gender are "really, really smart." Also at age 6, girls begin to avoid activities said to be for children who are "really, really smart." These findings suggest that gendered notions of brilliance are acquired early and have an immediate effect on children's interests.

conceptual question #today

The text describes Cattell's inclusion of patient details like race and gender in his testing process and links them to his eugenic aims. We continue to include very specific subject details in studies today with much emphasis being placed on ensuring that participants in studies are well-documented for diversity and representation. Where exactly is the difference in intention between researchers like Cattell and contemporary authors? Is it that we have shifted to more of a study of nurture on defined groups rather than a harmful study of falsified and generalized nature?

There is a shift towards recognizing differences and maybe exploring where they come from (socioeconomically), rather than 'ranking' groups of people based on their results and claiming that they are hereditary/present in every single individual of that group.

Is modern genetics the new eugenics?

[Charles J Epstein](#)

[Genetics in Medicine](#) 5, 469–475 (2003) | [Cite this article](#)

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big takeaways

- the history of intelligence testing is fraught with **biased assessments, measures, and policies**
- the field has moved from measuring abilities for the purpose of classifying/ranking people to instead **testing theories and claims** about how cognition works
- the rest of the course will focus on this second piece, i.e., **how does cognition work** and how do we **study** it?

bonus summary: intelligence video



<https://www.youtube.com/watch?v=9xTz3Qjclo>

bonus: take the Stanford-Binet IQ test

- <https://stanfordbinettetest.com/>
- take the long (24 minutes) version of the test
- discuss your reactions/experiences in L3's writing assignment!

next class



- **before** class:
 - *finish*: L3 quiz + writing assignments + meme
 - *submit*: project milestone #1 (due Feb 12, midnight)
 - *read*: L4 (Associations) chapter
- **during** class:
 - learning by association!