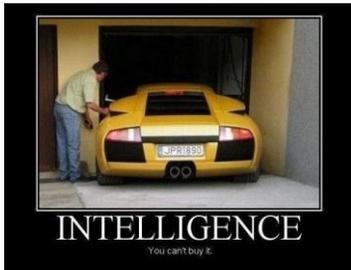


TESTING AND INDIVIDUAL DIFFERENCES | Chapter 10

What is Intelligence?



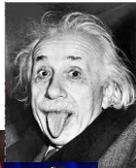
It is hard to define- debate is still on!

What is Intelligence?

Intelligence consists of:

- Abstract thinking
- Problem solving
- Capacity to acquire new knowledge

But is that really all there is?



Intelligence Tests

Galton- Darwin's cousin, believed in the genetic foundation of intelligence
HUGE proponent of Nature in the Nature vs nurture debate



Heritability- (statistical definition) proportion of total variation between individuals in a given population due to genetic variation

Intelligence Tests

Alfred Binet- the first to test intelligence.

Focused on reasoning, thinking and problem solving.



Assumed intelligence increased with age- used a technique where questions got harder in categories (absolute threshold) determined **MENTAL AGE**

If mental age=actual age then you have regular intelligence.

Intelligence Tests



Stanford-Binet Test (it came to America)

Added adults

$(\text{Mental age} \div \text{chronological age}) \times 100 = \text{IQ}$

Binet says intelligence improves with experience, this test disagrees- they believe that intelligence is fixed

Intelligence Tests



David Wechsler- new test including:

- Verbal and non-verbal (performance) skills assessed
- Success not dependent on formal schooling
- Subtests scored separately so you could score "high" in one category or another
- Continued to have different versions for adults and children

Testing Today

Wechsler Intelligence Scale for adults (WAIS) includes verbal IQ and performance IQ as well as a total IQ. Scale for children includes four scores and total IQ

Stanford-Binet has 10 main subtests measuring five subfields of intelligence: fluid reasoning, knowledge, quantitative problems, visual-spatial processing, working memory

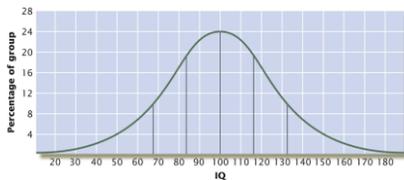
We no longer compare mental and chronological age- you get compared to others in your age group

Testing Today

Total score is compared to scores of age mates

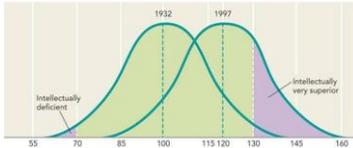
IQ 100 = average score at each age level

- So IQ reflects relative standing within a population of one's age



Flynn Effect

Each generation's average IQ scores are getting slightly higher, so the test needs to be re-normed or reset so that average IQ is 100 but that also means we are getting smarter and a 100 today is "higher" than a 100 50 years ago!



Aptitude vs Achievements

Aptitude: assesses potential to learn or perform well in the future

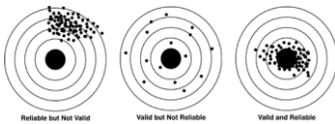
- Ex: SAT, ACT, GRE scores

Achievement: tests specific learning

- Ex: AP, classroom tests

Aptitude and achievement scores correlated with IQ

Statistical Reliability



Are the results repeatable or stable?
Estimated using a correlation coefficient

Methods for estimating reliability:

- Test-retest
- Alternate form
- Split-half

Statistical Validity

Does the test measure what it is supposed to? Evidence about a test's statistical validity:

Content validity: does the test measure what it should?
If I gave you a bio test on Monday that would not be valid!

Predictive validity: does the tests forecast what it should?
SAT scores to first year college GPA, AP to college class

Construct validity: does the test assess knowledge of the underlying theory or idea?
Algebra test should not require college level reading skills

Judging the Value of a Test

Statistical reliability and statistical validity

Reliability

Different results from one time to another

Same results from one time to another

Validity

Inaccurate conclusions and predictions

Accurate conclusions and predictions

Value of IQ Tests

Statistical Reliability

- Not good before age 7
- Exceptionally consistent for teens and adults

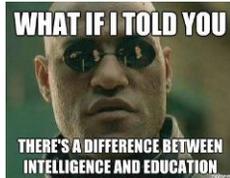
Statistical Validity

- Predicts success in school
- Predicts success in many life situations & jobs

Value of IQ Tests

Not a perfect measure of "smartness"

- Only measures some abilities
- Variability of individuals' emotional responses
- Individuals' motivational differences
- Cultural differences
- Differing educational and social experiences



Psychometric Approach



Scientific study and measurement of knowledge, abilities, attitudes, personalities, and other psychological characteristics

Approach to intelligence= products of intelligence!

Charles Spearman- *g* general intelligence, *s* special abilities like specific information and skills

Psychometric Approach

Thurstone- factor analysis, what underlying abilities are measured by intelligence tests?

Cattell- agreed with Spearman but labeled things differently:

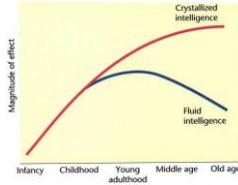
Fluid intelligence: basic powers of reasoning and problem solving

Crystallized intelligence: specific knowledge

Fluid vs Crystallized Intelligence

Fluid Intelligence- problem solving (declines as we age)

Crystallized Intelligence- factual information *wisdom* (increases as we age)



Information Processing Model

What mental processes are involved in intelligence behavior?

Like the processor in your computer!

Intelligence= Attention

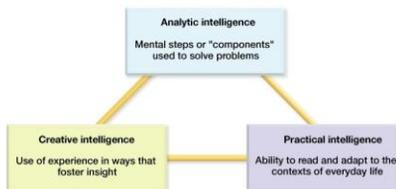
Intelligence=Speed

g is nothing more than working memory??



Triarchic Theory

Robert Sternberg- three types of intelligence– extended concept of intelligence beyond school and IQ tests!



Intellectual Disabilities

People whose IQ is less than 70 AND who fail to display skills at daily living, communication and other tasks

Down syndrome— abnormality in the 21st chromosome, usually marked by an IQ score below 20 if not treated in infancy.

Learning Disabilities

People who show a discrepancy between measured intelligence and academic performance

teapot tēpōt
tēpōt tēpōt sgraphia,
teōqōt tēōqōt
tēōbōt tēapōt
tēōdōt tēadōt
neurological

No specific
