

Test Construction

How do we construct Intelligence tests?

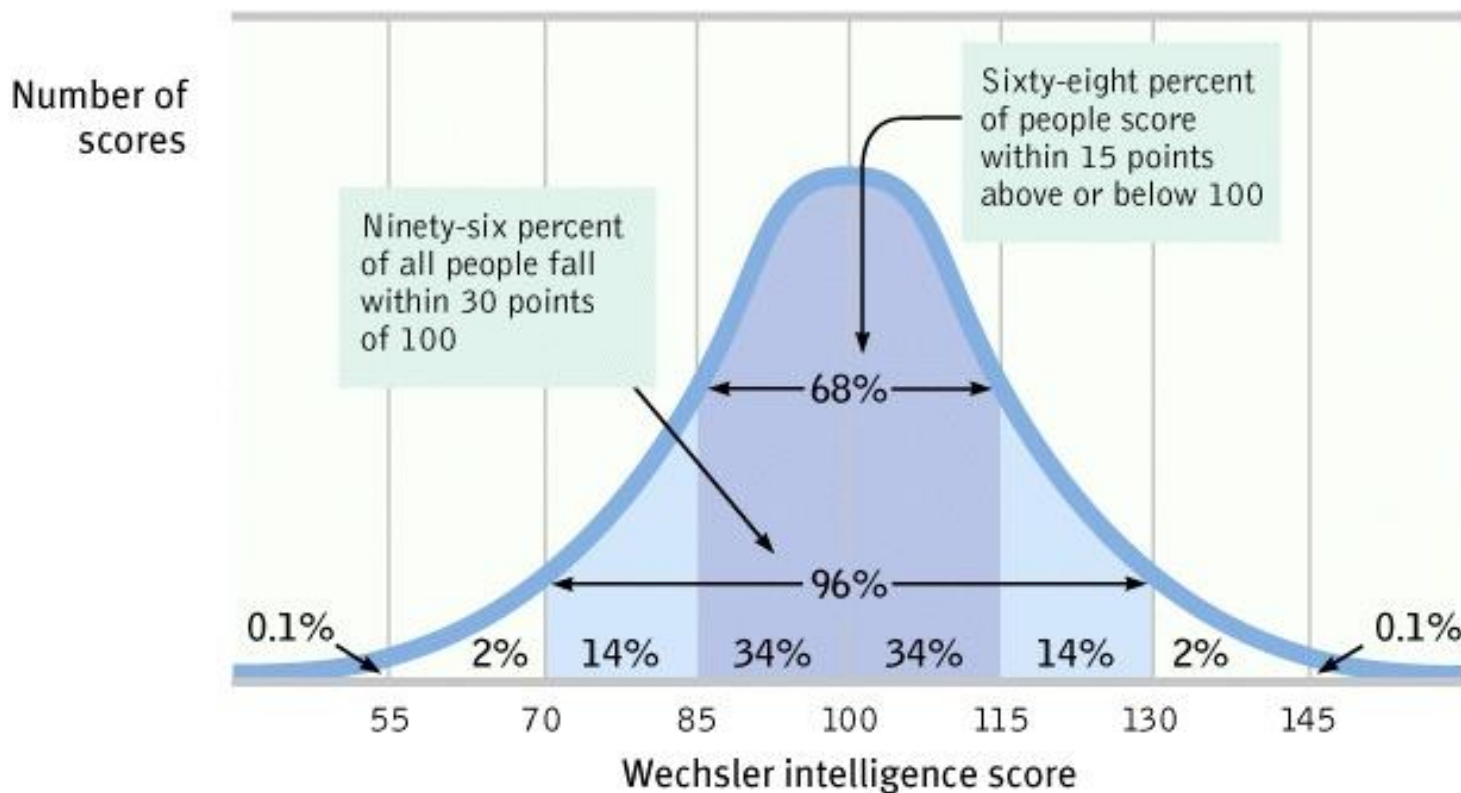
Tests must be:

- Standardized
 - Reliable
 - Valid



Standardization

- The test must be pre-tested to a representative sample of people and form a normal distribution or bell curve
 - If we didn't have a representative sample to compare to, we wouldn't know what our scores meant!



Reliability

- The extent which a test yields consistent results over time.
- What is a "reliable" friend?
- *Split halves, alternative forms, or test-retest methods.*



Validity

- The extent to which a test measures or predicts what it is supposed to measure.
- Two types:
 - Content Validity
 - Predictive Validity
- We'll come back to these in a minute



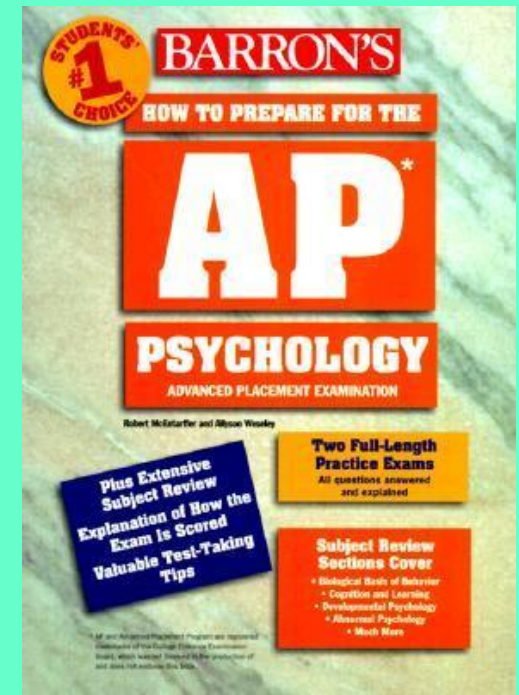
"I don't reimburse. I validate. I listen and acknowledge how difficult it was for you to find a place to park."

Aptitude v. Achievement Tests

Achievement Test

- A test designed to assess what a person has learned.
 - Examples: Psychology exams, driver's tests

Content Validity: does the test do a good job of sampling the criterion that it is supposed to?

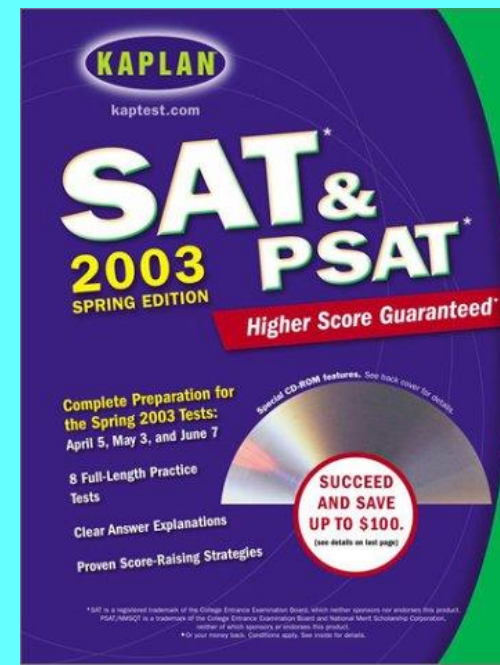


Aptitude v. Achievement Tests

Aptitude Test

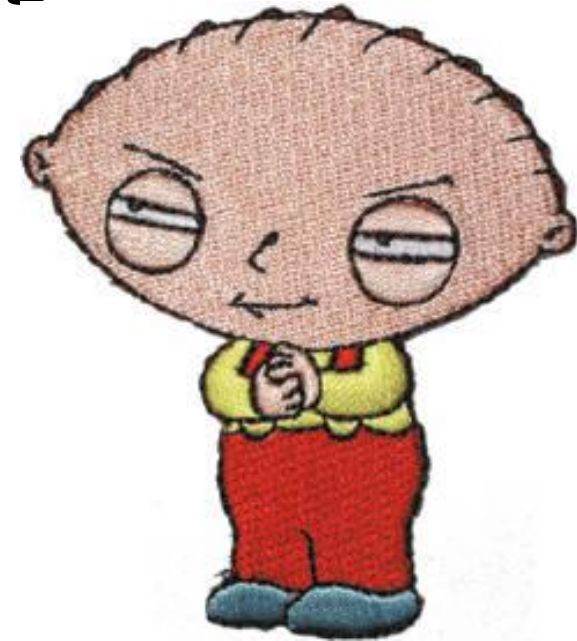
- A test designed to predict a person's future performance.
- The ability for that person to learn.
 - Examples: SAT, Career Assessments

Predictive Validity: does the test do a good job of predicting the **criterion** that it is supposed to?



Brain Size and Intelligence

Is there a link?



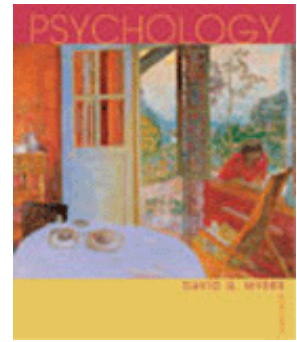
- Small $+0.15$ correlation between head size and intelligence scores (relative to body size).
- Using an MRI we found $+0.44$ correlation with brain size and IQ score.
- Portion sizes vary as well
 - Einstein had abnormally large parietal lobes
- Environmental experiences impact
 - Highly educated people die with 17% more synapses than counterparts



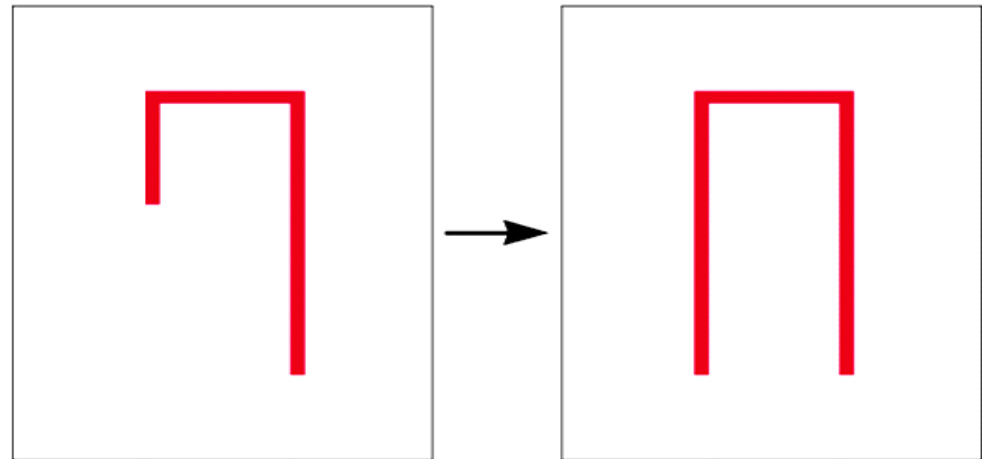
Other Environmental Influences

- Infants who suffer from extreme malnutrition during infancy average 20 I.Q. points lower than other children (Stock and Smythe, 1963)
- Toxins in the environment such as lead found in some paints are associated with reduced I.Q. (Needleman, 1990)
- Intelligence declines with family size; the fewer children there are the smarter you are likely to be (Zajonc, 1975)
- Intelligence declines with birth order; first-borns tend to be brighter (Zajonc, 1975)
- I.Q. is negatively correlated with family risk factors, such as social class or absence of father figure (1989)

Brain Function and Intelligence



- Correlation between fast perceptual speed and general intelligence
 - People who can perceive the stimulus very quickly tend to score somewhat higher on intelligence tests



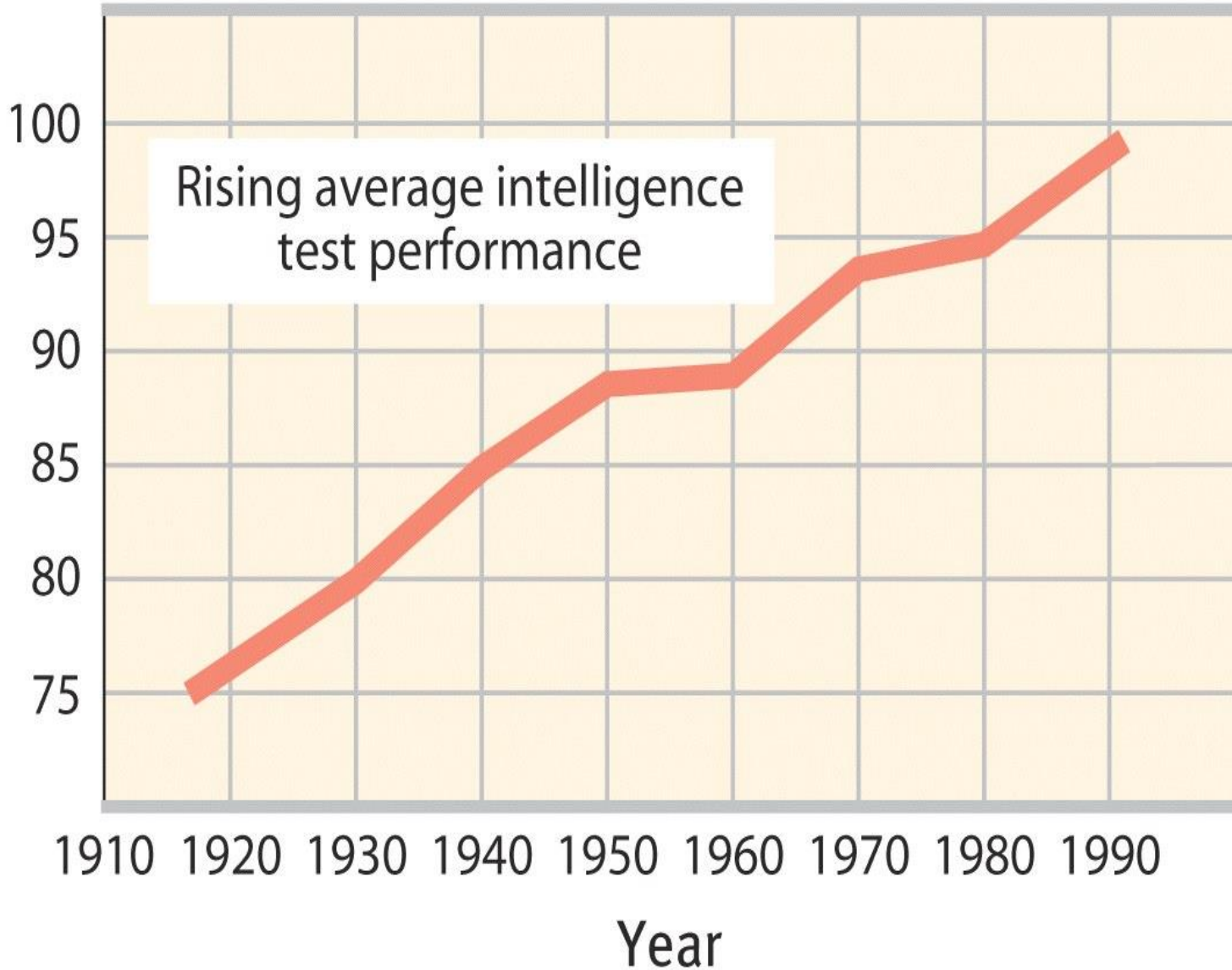
Stimulus **Mask**
Question: Long side on left or right?

Neurological Speed

Correlation between intelligence and neurological processing

Flynn Effect

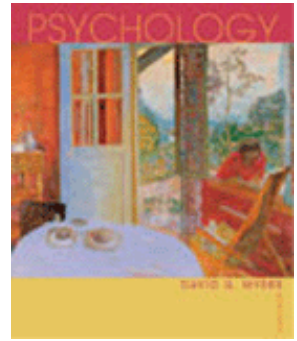
Intelligence scores, based on 1996 standards



Flynn Effect:

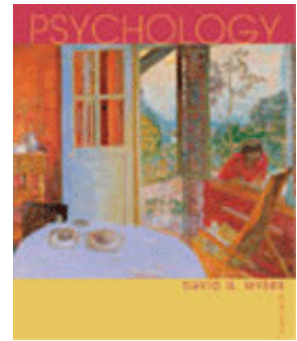
IQ scores going up about 3 points per decade

Assessing Intelligence



- Wechsler Adult Intelligence Scale (WAIS)
 - most widely used intelligence test
 - subtests
 - verbal
 - performance (nonverbal)

Assessing Intelligence: Sample Items from the WAIS



VERBAL

General Information
Similarities
Arithmetic Reasoning
Vocabulary
Comprehension
Digit Span

PERFORMANCE

Picture Completion
Picture Arrangement
Block Design
Object Assembly
Digit-Symbol Substitution

Emotional Intelligence (EQ)



- First called social intelligence.
- The ability to perceive, express, understand, and regulate emotions.
- Some studies show EQ to be a greater predictor for future success than IQ

Emotional Intelligence Test