

# Intelligence



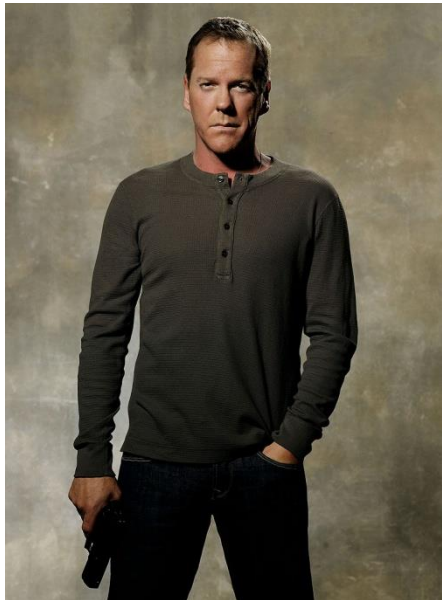
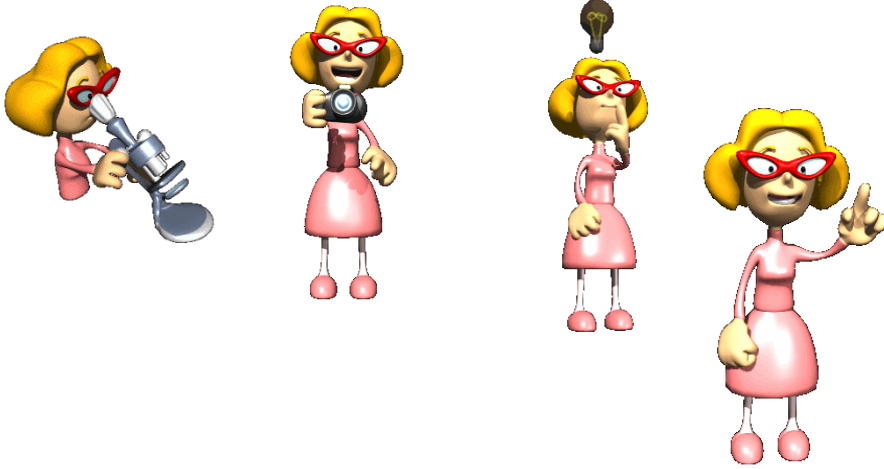
What makes us smart?  
Or not so smart?

# Theories of Intelligence

- No one real definition
- Fluid versus Crystallized Intelligence
- 4 main theoretical concepts of intelligence....



# Charles Spearman and his *G* factor



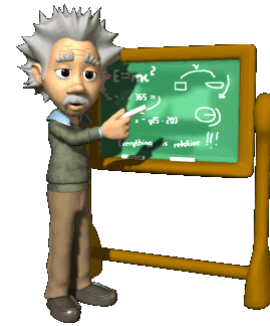
Jack Bauer is good at torturing, bomb defusing, shooting, figuring out evil plots and saving the country (and he is good looking). Is there anything he cannot do?

- Used factor analysis and discovered that what we see as many different skills is actually one **General Intelligence**.
- If you are good at one subject you are usually good at many others.

# Howard Gardner and Multiple Intelligences

- Gardner believed that there exists at least 7 different types of intelligences.

1. Linguistic
2. Logical-mathematical
3. Spatial
4. Musical
5. Body-kinesthetic
6. Intrapersonal
7. Interpersonal
8. Naturalist



# Robert Sternberg and his Triarchic Theory



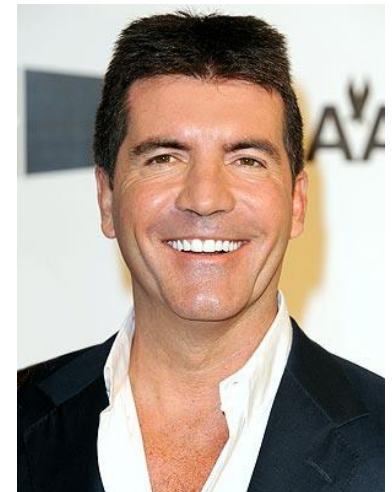
- Most commonly accepted theory today.
- Three types of intelligence
  1. Analytical
  2. Creative
  3. Practical

# Goleman and his EQ

- Emotional Intelligence
- Interpersonal and intrapersonal intelligences.
- Maybe EQ is a better predictor for future success than IQ.

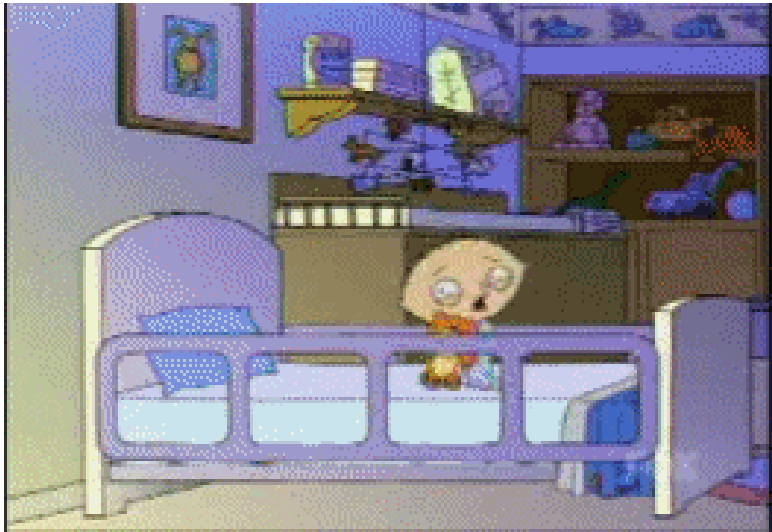


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# Brain Size and Intelligence

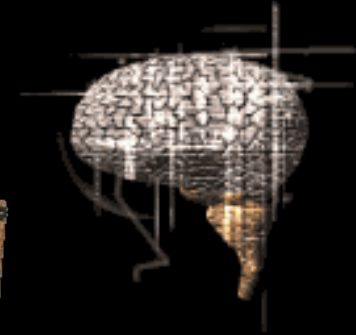
## Is there a link?



- 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.

# Brain Function and Intelligence

- Higher performing brains are less active than lower performing brains (use less glucose).
- Neurological speed is also a bit quicker.





# How do we Assess Intelligence?



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"The five candles represent his mental age."

- Alfred Binet and Theodore Simon set out to figure out a concept called a **mental age** (what a person of a particular age should know).
- They discovered that by discovering someone's mental age they can predict future performance.
- Hoped they could use test to help children, not label them.

# Terman and his IQ Test

- Used Binet's research to construct the modern day IQ test called the Stanford-Binet Test.
- $IQ = \text{Mental age} / \text{Chronological age} \times 100$ .
- A 8 year old has a mental age of 10, what is her IQ?
- A 12 year old has the mental age of 9, what is his IQ?
- A boy has the mental age of 10 and an IQ of 200, how old is he?

# Problems with the IQ Formula

- It does not really work well on adults, why?

If a 60 year old man



does as well as an average 35 year old

then his IQ would be 50!!!!!!

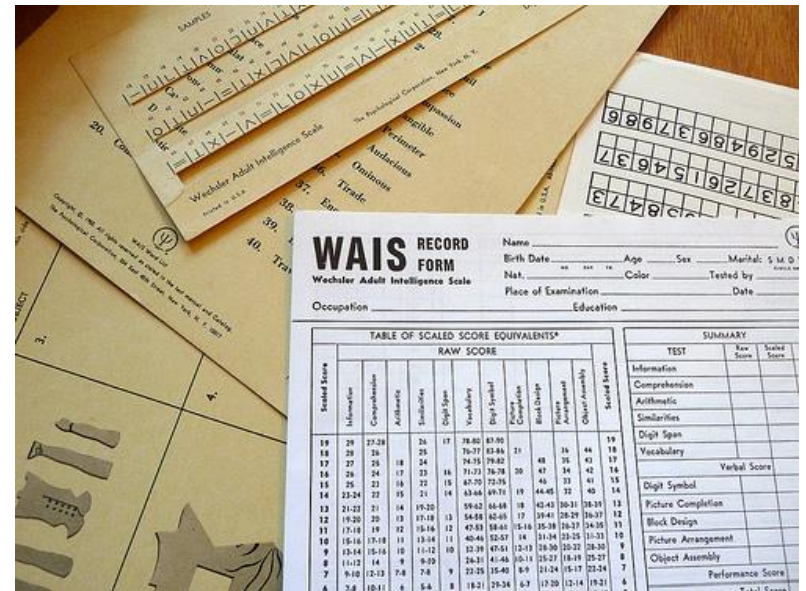
That makes no sense!!!!



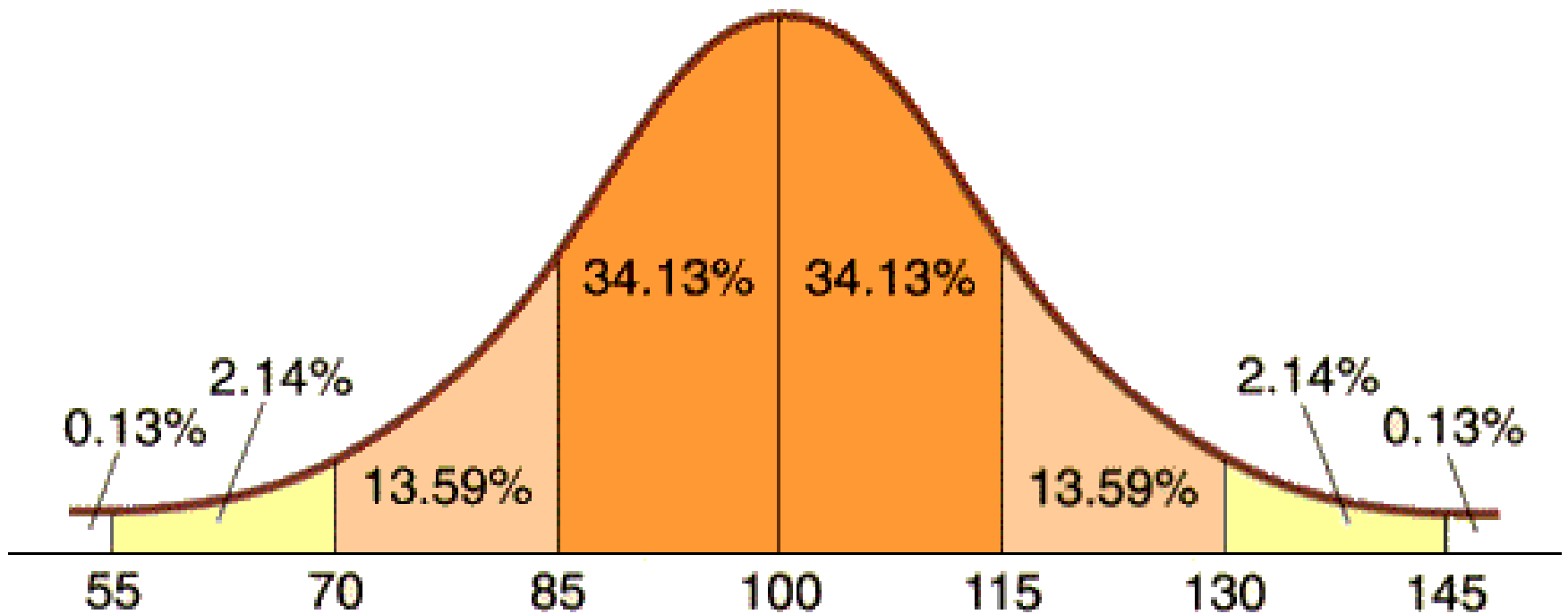
# Wechsler Tests



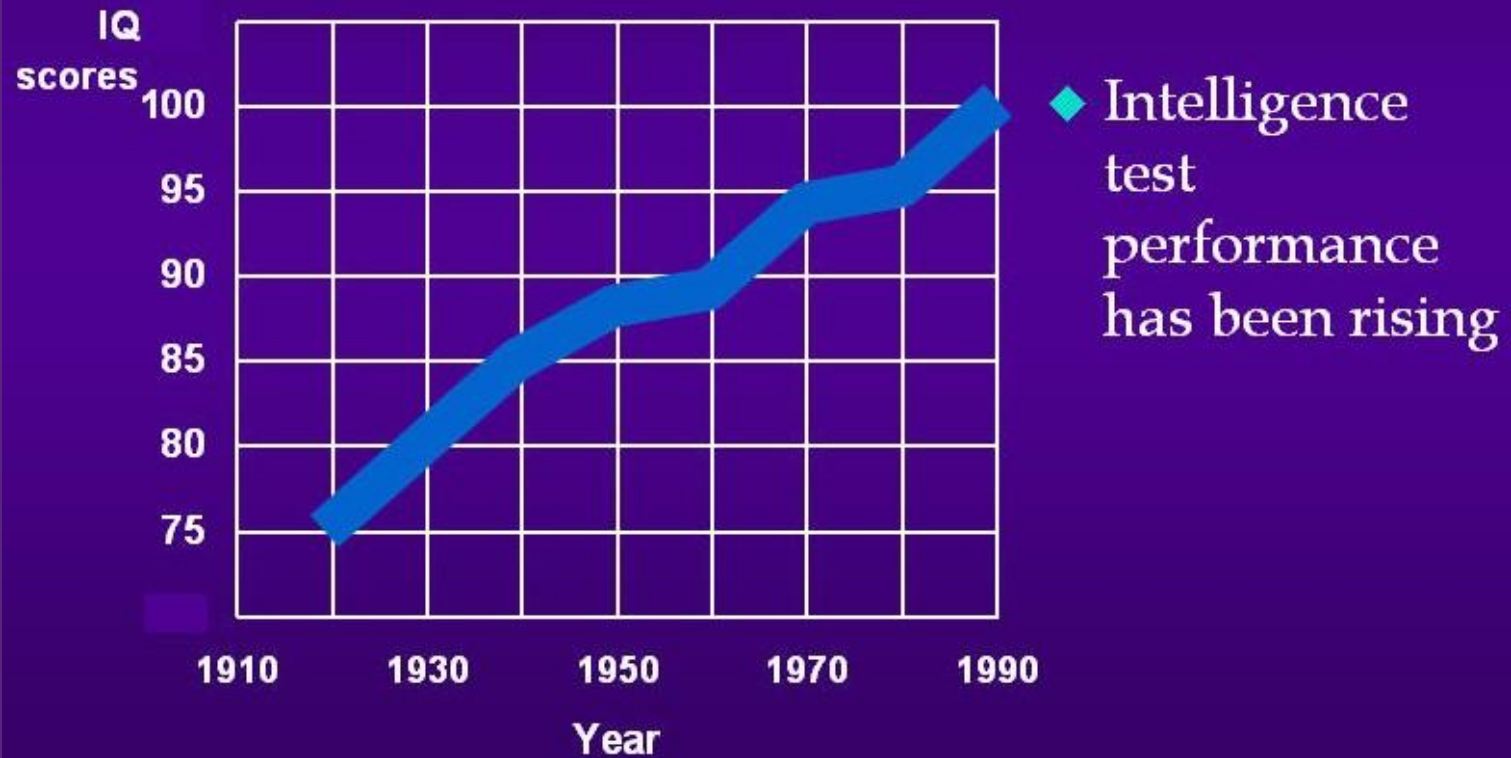
- More common way to give IQ tests....does not use the formula but uses the same scoring system.
- WAIS
- WISC
- WPPSI



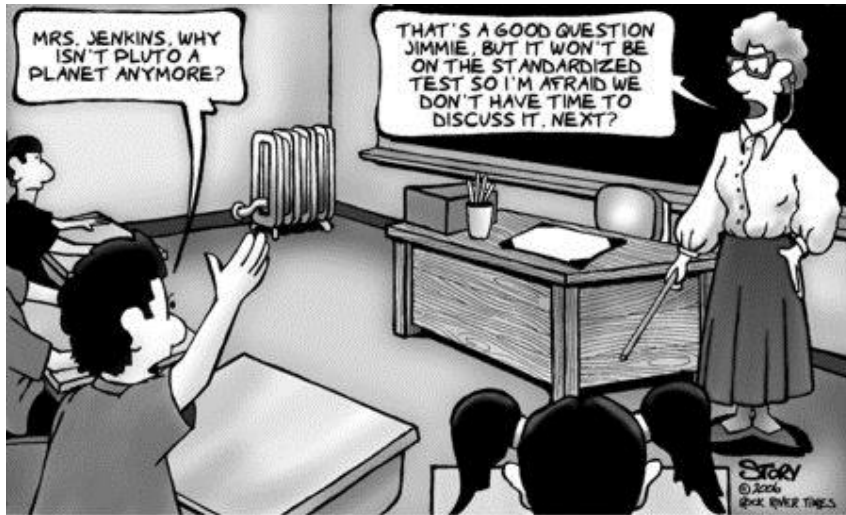
# Normal Distribution



# The Flynn Effect

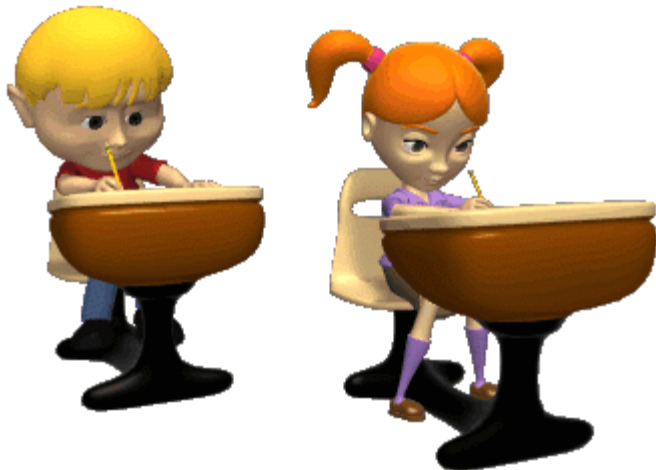


# How do we construct an Intelligence Test?



WELCOME TO THE CULT OF STANDARDIZED TESTING; NO CHILD WILL BE LEFT BEHIND.

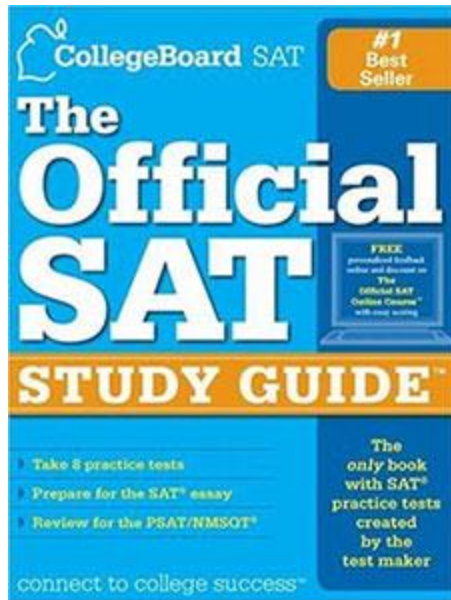
- **Standardized:** the questions have been piloted on similar populations and the scores fall on a normal distribution.
- **Reliable:** Test-Retest, Split-halves Methods.
- **Validity:** Content, Predictive or Construct.



# Types of Tests

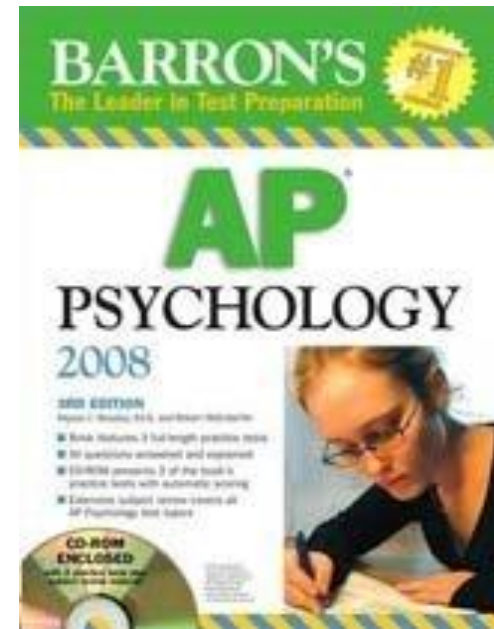
## Aptitude

- Measure ability or potential.



## Achievement

- Tests that measure what you have learned.





# Does Intelligence Change Over Time?

By age 3, a child's IQ can predict adolescent IQ scores.

Depends on the type of intelligence, crystallized or fluid.



# Extremes of Intelligence

- Akrit Jaswal

