

13. Statistics, Tests and Measurements

**We will now study
statistics.**

**We will cover the different
types of measurements and
tests used in statistics.**

The sections in this unit are:

**13.1. Descriptive and Inferential
Statistics; Samples,
populations, norms**

13.2. Reliability and validity

13.3. Measurement of intelligence

13.4. Types of tests

13.1 Descriptive and Inferential Statistics

Samples, populations, norms

- **Statistics**
 - **collection, analysis, interpretation, and presentation of numeric data**

- **Samples**
 - representative subset of larger population
 - random sample
- **Populations**
 - group of people looking to study
- **Norms**
 - identifying normal behavior of group to compare to
 - standardizing

- **Descriptive Statistics**
 - used for correlational and experimental designs
 - measurements of behavior from sample
- mean- average
- mode- most commonly occurring score
- median- middle score, separates lower and upper halves of scores

- **Standard Deviation** - statistical measure of how much scores in a sample vary around the mean
 - higher SD = more variability (more spread)
 - lower SD = less variability (less spread)
- **Normal Distribution**
 - bell curve showing symmetrical alignment of two variables (e.g Intelligence)

- **Inferential Statistics**
 - inferences about population based on characteristics of sample
- **statistical significance**
 - not likely to have happened by chance
 - significant equals 5% of the time or less

13.2 Reliability and Validity

Reliability

- **stability and consistency of scores**
- **does not need to be valid to be reliable**

Types of Reliability

- **test-retest reliability**
- **internal consistency**
 - How well does a test correlate with itself
 - **split-half reliability**
 - **Cronbach's alpha** - avg correlation for every way a test can be split in half

Validity

- **how well a test measures what it is supposed to measure**
- **must be reliable to be valid**
- **types of validity**
 - **face or content validity**
 - **predictive validity**
 - **construct validity**
- **standardizing measures**

13.3 Types of Tests

- **Tests used to rule out chance**
- **t-test - computed for two means to see if they come from same population (e.g., of two groups or variables)**
- **ANOVA- analysis of variance**
- **Pearson correlation coefficient (-1.0 to +1.0)**

13.4 Measurement of Intelligence

- **Stanford-Binet Intelligence Scale**
 - **first IQ test**
 - **still widely used today**
 - **norming and standardization**
- **Wechsler Intelligence Tests**
 - **WAIS-IV**
 - **WISC-V**
 - **WPPSI-IV**
- **Flynn effect- each generation, higher IQ**