## Types of Data

| | |
|---|---|
| Categorical/-Nominal | Do not hold numerical meaning (arbitrary) |
| Ordinal | Rank ordering, differences not equal |
| Interval | Intervals between points on a scale are equal and the same, zero is arbitrary |
| Ratio | Zero is NOT arbitrary (an absence) |

## Experimental Designs

| | |
|---|---|
| Balanced | each cell (each combination of factors) contain the same number of replications (how many measurements |
| Complete | every level of one factor combined with every level of the other factor(s) |
| Incomplete | Lots of factors or many measurements (nested/block design best) |
| Single subject/r-epeated measures | Subject acts as their own control |

Ceiling effects: Test is too easy (100%)
Floor effects: Test is too hard (0%)
Learning effects: subjects improve with more trials
Order effects: test order may have effect on outcome

## Characteristics of Data Sets

| | |
|---|---|
| Data Shape | Frequency distributions are a common way to describe data shape (range of scores) |
| Location | finding central tendency or middle of data |
| Spread | Variance -> range, SD and IQR |
| Outliers | |
| Clustering | e.g. bimodal distribution |

## Characteristics of Data Sets (cont)

| | |
|---|---|
| Granularity | Data only takes on certain values (e.g. discrete data + rounded continuous) |
| | (e.g. discrete data + rounded continuous) |

## Types of Sampling

| | |
|---|---|
| Random | Increased ability to generalise to population |
| Systematic | Choosing subjects from a population at a regular interval (choosing every second item) |
| Cluster | Randomly select a few schools in your sample and have all students as participants |
| Convenience | Sample used because it is accessible rather than representative of a population |

## Central Limit Theorem

• draw a large enough sample from the population and plot all of those sample means, our sampling distribution will approach normal
• Sampling distribution uses sample means
• Population mean: mean of all sample means

**Standard Error**
- SD of sampling distribution
95% CI = sample mean +- 1.96 x SE

## Pearson's Correlation (r)

| Strength | Positive | Negative |
|---|---|---|
| Strong | .8 to 1 | -.8 to -1 |
| Moderate | .5 to .7 | -.5 to -.7 |
| Weak | 0 to .4 | 0 to -.4 |

## ANOVA Variance

| DF | Sum of Squares | Mean Sqaure |
|---|---|---|

## ANOVA Variance (cont)

| | | | |
|---|---|---|---|
| **Between Groups** | no. groups -1 | How much data varies between different groups (variance) | Average variance between groups |
| **Within Groups** | no. data points - no. of groups | How much data varies within each group (variance) | Average variance within groups |
| Total | no. data points - 1 | | |

## Types of ANOVAs

| | |
|---|---|
| One-way | 1 factor/independent variable (categorical) |
| Two-way | 2+ factors/IVs (categorical), interactions |
| Repeated Measures | Measure the same outcome variable on the same population twice |
| | Each subject is now a *random factor* (rather than fixed factors) |

## T-test Types

| Test | Description | DF |
|---|---|---|
| 1-sample (single) | Compares your experimental group with a hypothesised or known value | n-1 |
| 2-sample (independent) | Compares the means for two independent samples | (n1-1) + (n2-1) |
| Paired | measuring something for the same group of people | n-1 |

*One tailed*: Directionless -> one group is different from the other group (in pos or neg direction)
*Two tailed*: Directional -> one group if larger or smaller than the other

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## Linear Regression

| | |
|---|---|
| Beta | degree of change in the outcome variable for every 1 unit of change in the predictor variable |
| R-Sqaured | Fit of the model and represents how much variance in the DV can be accounted for by the IV |
| Analysis of Variance | Adj SS (adjusted sum of squares) -> total variance of data |
| | - The error SS is what is left over -> variance that cannot be explained by other factors or variance in the model |

**Predicting**

*CI*: If we repeated our experiment many times an degenerated a confidence interval each time, 95% of those confidence interval will contain the true population value
*Prediction Interval*: Predicting future observ-ations from the regression equation

## Assumptions of Parametric Tests

1. Normally distributed data
2. Homogeneity of variance
3. Interval/ratio data
4. Independence

*This means that you may have to use non-parametric tests when...*

• your data is better represented by the median (e.g. skewed data like salary or house prices), or
• you have a very small sample size, or
• you have ordinal (e.g. rating scales, some questionnaire results) or categorical data

## Parametric and Non-Parametric Equivalent Tests

| Parametric | Non-Parametric |
|---|---|
| 1-sample AND paired t-test | Sign test or Wilcoxon signed-rank test |
| 2-sample t-test | Mann-Whitney test |

## Parametric and Non-Parametric Equivalent Tests (cont)

| | |
|---|---|
| One-way ANOVA | Kruskal-Wallis test |
| Multifactor ANOVA (two-way + repeated measures) | N/A |
| N/A | Chi-square test |

## Types of Qualitative Data

| | |
|---|---|
| Transcripts (e.g. interview) | Allows the researcher to ask about specific things and probe deeply |
| Observ-ation | ethnographic studies |
| Pictures | Pictures could be photos that the researcher has taken (drawings, rooms etc) |
| Documents | Many types (e.g. progress notes) |
| Web content | Publicly available (e.g. social media) |

## Sampling for a Qualitative Study

| | |
|---|---|
| Typical Case | Average case |
| Extreme case | Unusual, unique or distinct case |
| Maximum Variation | Looking for the biggest range of perspectives |
| Homogenous Group | Minimum variation sampling + Focus on in-depth area of interest |
| Stratified Purpose | Selected cases from identified subgroups (e.g. 5 people from 4 age groups) |
| Theoretical | Start data collection -> analyse results -> form therapy -> continue sampling |
| Snow Ball | One respondent is asked to suggest others. |
| Convinience | Recruiting anyone who is at hand |

## Qualitative Evidence

| Tangibly (concrete) | Intangibly |
|---|---|
| Guidelines, protocols | understanding what clients want from their clinicians |
| practice recomm-endations based on qual research | broaden knowledge and change behaviours |

## Setting up a Qualitative Analysis

| Deductive (top-down) | Inductive (bottom-up) |
|---|---|
| coding will be influenced by the framework you're using | coding will be purely based on what the participant has said, without trying to fit it into a framework. |