Choosing the Right Statistic

Important Factors in Choosing

Variable Types

Continuous
- Numeric

Categorical
- Category

- Dichotomous / binary
  - 2 categories

- Levels – number of categories

Independent vs. Dependent Variables

Independent
- Predictor
- IV
- X

Dependent
- Outcome
- DV
- Y

Purpose of the Analysis

- Describe
  - Descriptive statistics

- Draw Conclusions
  - Inferential statistics

- Make Associations
  - Determine how data relates to each other

Describing Data

Describing Data

Categorical
- Frequency
- Percent

Continuous
- Where the data falls:
  - Mean
  - Median
  - Mode

- How the data is spread:
  - Range
  - Standard deviation
  - Variance

Drawing Conclusions

Comparing Categories

- Categorical IV
- Continuous DV
- Simplest:
  - t-tests
- More complex:
  - ANOVA family

Analysis	Categorical IV	CV	Continuous DV
Independent t-test	1 2 levels		1
Dependent t-test	1 Must be time 2 levels		1
ANOVA	1+ 2+ levels		1
Repeated Measures ANOVA	1+ 1 must be time 2+ levels		1
Mixed Measures ANOVA	2+ 1 must be time 2+ levels		
ANCOVA	1+	1+	1
MANOVA	1+		2+
MANCOVA	1+	1+	2+

Only 1 IV & with 2 levels

- t tests

Analysis	Categorical IV	CV	Continuous DV
Independent t-test	**1** **2 levels**		**1**
Dependent t-test	**1** **Must be time** **2 levels**		**1**
ANOVA	1+ 2+ levels		1
Repeated Measures ANOVA	1+ 1 must be time 2+ levels		1
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ANCOVA	1+	1+	1
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MANCOVA	1+	1+	2+

Changes over Time

- Dependent t
- Repeated measures
- Mixed measures

Analysis	Categorical IV	CV	Continuous DV
Independent t-test	1 2 levels		1
Dependent t-test	**1** **Must be time** **2 levels**		**1**
ANOVA	1+ 2+ levels		1
Repeated Measures ANOVA	**1+** **1 must be time** **2+ levels**		**1**
Mixed Measures ANOVA	**2+** **1 must be time** **2+ levels**		
ANCOVA	1+	1+	1
MANOVA	1+		2+
MANCOVA	1+	1+	2+

Controlling for Another Factor

- Covariates (CV)
- ANCOVA
- MANCOVA

Analysis	Categorical IV	CV	Continuous DV
Independent t-test	1 2 levels		1
Dependent t-test	1 Must be time 2 levels		1
ANOVA	1+ 2+ levels		1
Repeated Measures ANOVA	1+ 1 must be time 2+ levels		1
Mixed Measures ANOVA	2+ 1 must be time 2+ levels		
ANCOVA	**1+**	**1+**	**1**
MANOVA	1+		2+
MANCOVA	**1+**	**1+**	**2+**

Multiple DVs

- MANOVA
- MANCOVA

Analysis	Categorical IV	CV	Continuous DV
Independent t-test	1 2 levels		1
Dependent t-test	1 Must be time 2 levels		1
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MANCOVA	**1+**	**1+**	**2+**

Categorical IV & DV – Chi-Squares

Analysis	Usage	Continuous DV Equivalent
Goodness of Fit	Compare a sample to a population	Single sample t-test
Independent	Compare unrelated categories	Independent t-test
McNemar	Compare over time	Dependent t-test
Bhapkar	Compare over time with multiple levels of the DV	Repeated measures ANOVA

Comparing a Sample to a Population

- Goodness of fit chi-square

- Single sample t-test

Continuous IVs – the Land of Regression

- Stepwise / hierarchical: shows how much influence each variable has

- Simple: 1 IV
- Multiple 2+ Ivs

- Moderation/Mediation: believe other variables influence your DV

Analysis	DV Type	Levels of DV
Binary Logistic Regression	Categorical	2
Multinomial Logistic Regression	Categorical	3+
Linear Regression	Continuous	NA

Making Assocations

Making Associations

- How does your data "jive" together?

- How are concepts theoretically related?

- NO prediction
- NO true x and y variables

Scale Validation

Validated Before
- Confirmatory factor analysis (CFA)

Never Been Validated
- Exploratory factor analysis (EFA)

Creating a Theory?

- Yes – Structural Equation Modeling (SEM)

- No
    - Predicting group membership
        - **Discriminant function analysis (DFA)**
    - Seeing how the data "hangs" together and is naturally grouped
        - **Cluster analysis**

Correlations - Determining a Relationship between Data

- **Categorical Variables: Spearman Rank**

- **Continuous Variables: Pearson**

Questions?