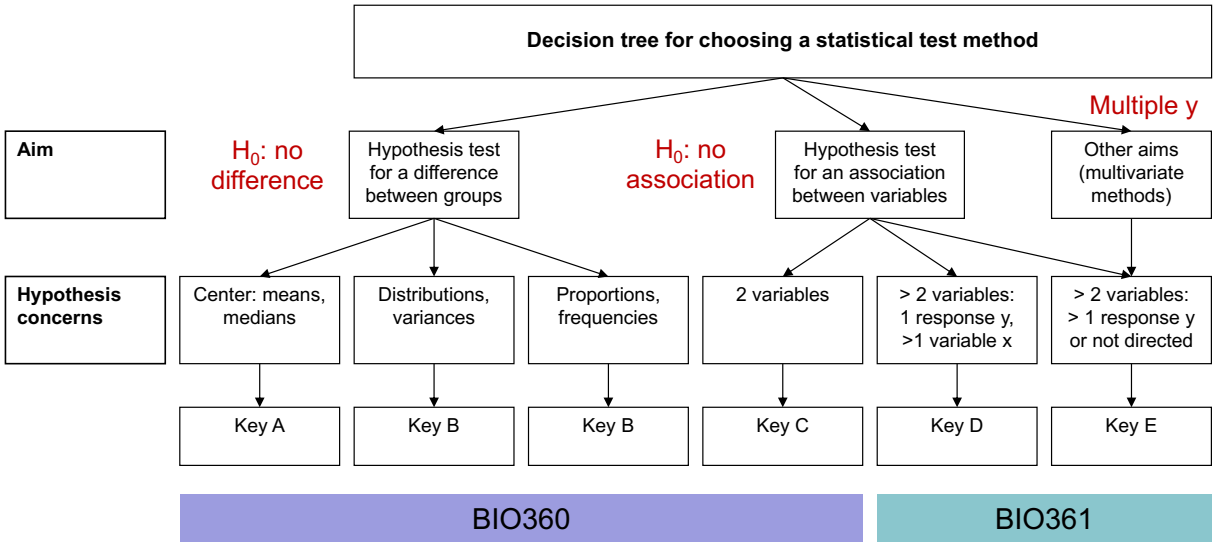
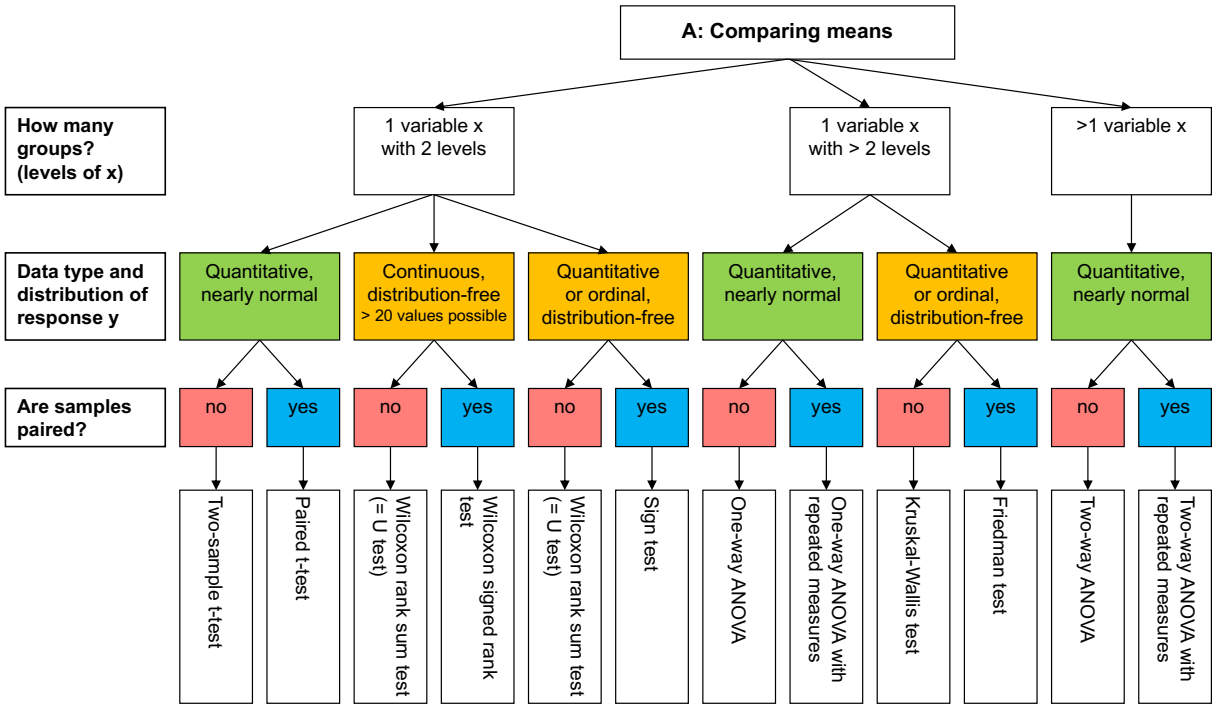
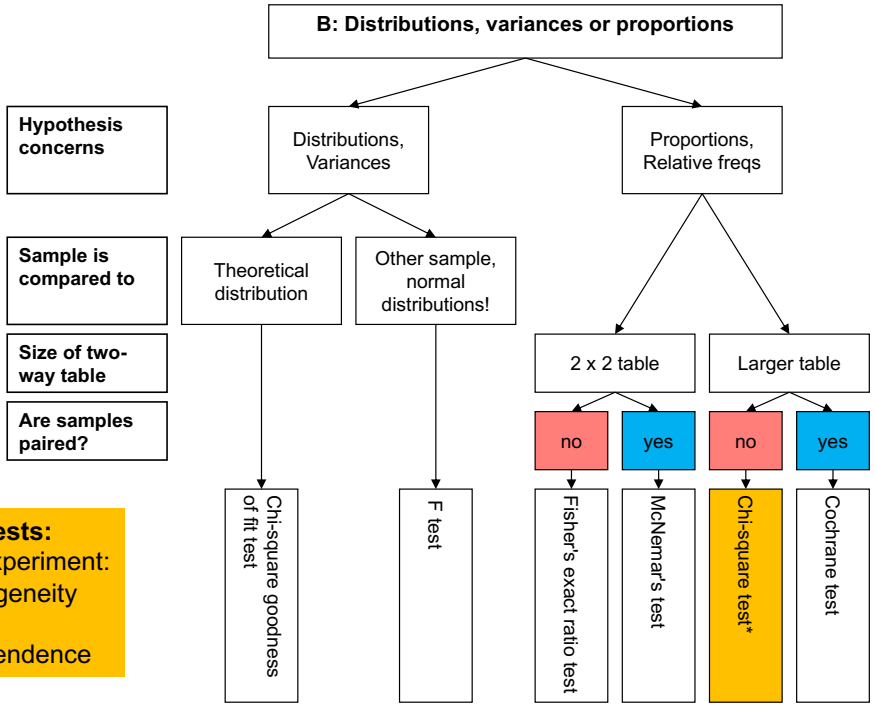
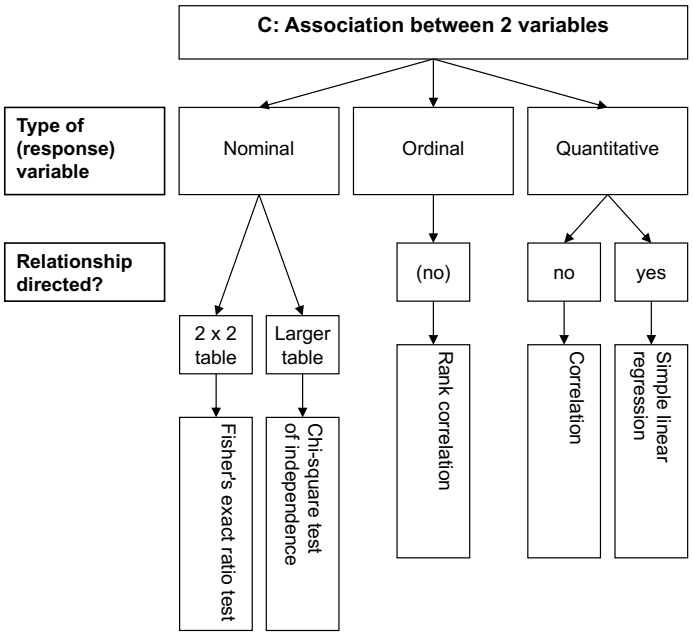
The following decision tree has been translated and modified from course materials by Marina Groner, Department of Psychology, University of Berne, Switzerland. Course: *Project-oriented course in quantitative and qualitative methods of social research*, Coordination of Continuing Education, University of Bern, Switzerland, Fall 2005.

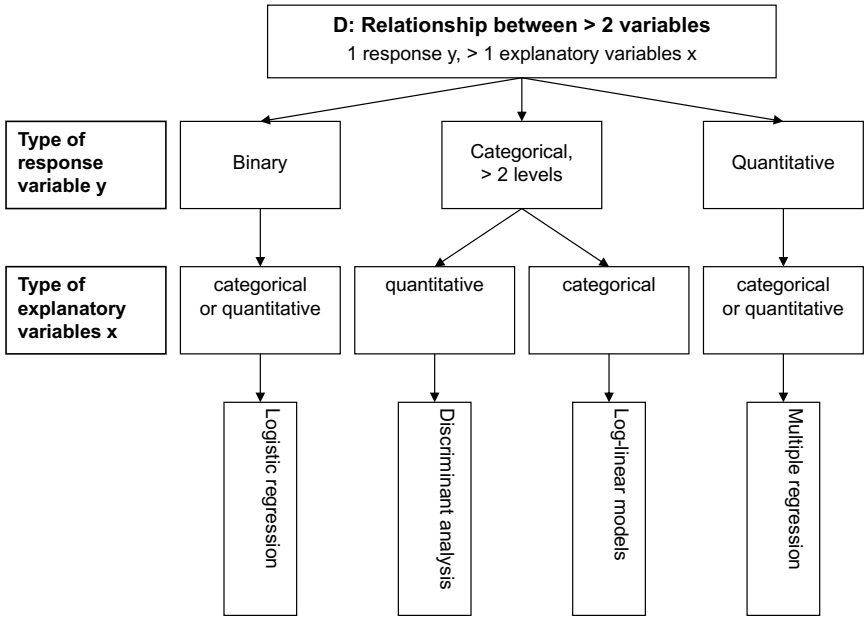


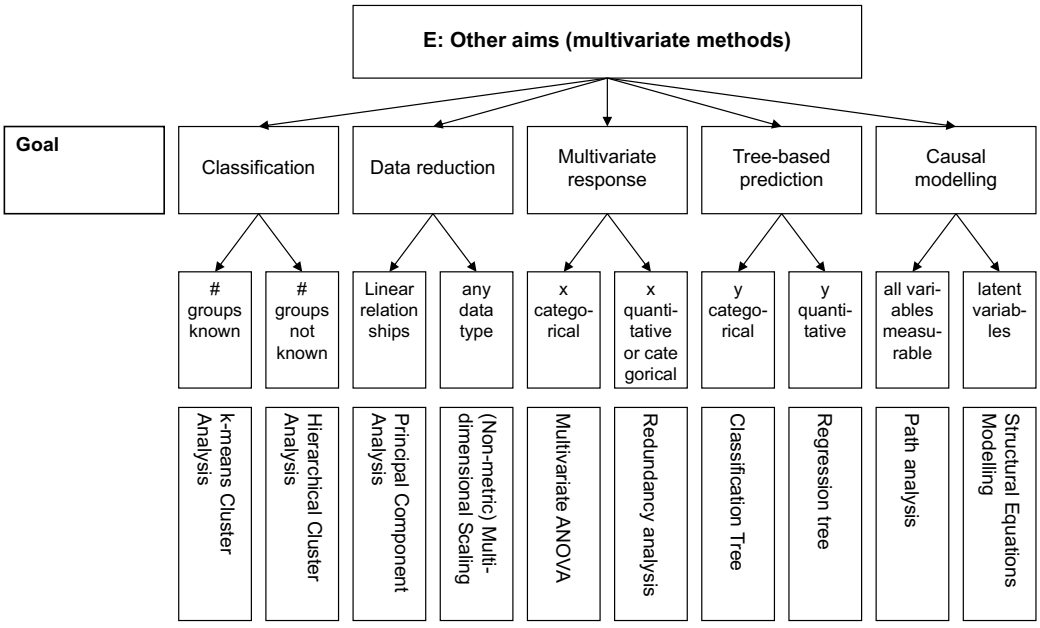




*) **Chi-square tests:**
- *x* given by experiment: test of homogeneity
- *x* observed: test of independence




D: Relationship between > 2 variables
1 response y, > 1 explanatory variables x
Type of response variable y
Binary
Categorical, > 2 levels
Quantitative
Type of explanatory variables x
categorical or quantitative
quantitative
categorical
categorical or quantitative
Logistic regression
Discriminant analysis
Log-linear models
Multiple regression


E: Other aims (multivariate methods)
Goal
Classification
Data reduction
Multivariate response
Tree-based prediction
Causal modelling
groups known
groups not known
Linear relation ships
any data type
x catego-rical
x quanti-tative or cate gorical
y catego-rical
y quanti-tative
all vari-ables measu-rable
latent variab-les
k-means Cluster Analysis
Hierarchical Cluster Analysis
Principal Component Analysis
(Non-metric) Multi-dimensional Scaling
Multivariate ANOVA
Redundancy analysis
Classification Tree
Regression tree
Path analysis
Structural Equations Modelling

Practice Problems

Part 1: Assume that body weight (kg) and weight loss (kg) are normally distributed:

1. Compare body mass in patients before and after one month of taking both phentermine and topiramate.
2. Compare mean weight loss in patients who take both phentermine and topiramate to weight loss in control patients without these drugs.
3. Compare the proportions of their babies born with cleft palates between patients who take both phentermine and topiramate and patients not taking these drugs.
4. Test whether weight loss in patients who take both phentermine and topiramate depends on age.
5. Test whether weight loss in patients who take both phentermine and topiramate depends on age and gender.
6. Assess if weight loss in patients taking phentermine and topiramate depends on whether they the medications are taken in the morning, at noon, or at night.
7. Assess if weight loss in patients depends on whether or not they are taking phentermine, whether or not they are taking topiramate, or both.
8. Test whether the variance of weight loss differs between patients who take both phentermine and topiramate and control patients without these drugs.
9. Assess if weight loss over one week, one month, and one year depends on whether or not patients are taking phentermine, whether or not they are taking topiramate, or both.

Part 2: Now, assume that weight loss (kg) distribution is skewed and samples small:

10. Compare body mass in patients before and after one month of taking both phentermine and topiramate.
11. Compare weight loss in patients who take both phentermine and topiramate to weight loss in control patients without these drugs.
12. Assess whether weight loss in patients taking phentermine and topiramate depends on taking the medications in the morning, at noon, or at night.

Part 3: Finally, assume that occurrence of weight loss (kg) was measured as yes/no:

13. Test whether the occurrence of weight loss in patients who take both phentermine and topiramate depends on age and gender.
14. Assess whether the occurrence of weight loss in patients depends on whether or not they are taking phentermine, whether or not they are taking topiramate, or both.

1: Paired t-test; 2: Two-sample t-test; 3: Fisher's exact test; 4: Simple regression; 5: Multiple regression; 6: One-way ANOVA; 7: Two-way ANOVA; 8: F-test; 9: Two-way ANOVA with repeated measures; 10: Wilcoxon signed rank test; 11: Wilcoxon rank sum test; 12: Kruskal-Wallis test; 13: Logistic regression; 14: Logistic regression.