Linear Model and Assumptions

1. Statistical model –
   1. Linear Model
      1. Each person’s individual score
      2. Each person’s score
   2. Experimental error
      1. Random sampling assumptions
         1. Independence
         2. Identical distribution
      2. Identical distribution
         1. Homogeneity
         2. Normal distribution
   3. Violations of assumptions
      1. Robust
2. Sampling bias and loss of subjects
   1. Exclusion of subjects from experiment
   2. Subject loss
      1. Why lose?
      2. Back to MCAR and MNAR
   3. Solutions
3. Violations of assumptions
   1. All these are tested with fancy monte carlos!
      1. Positive bias tests are liberal
      2. Negative bias tests are conservative
   2. Independence of scores
   3. Identical error distributions
   4. Normal distribution
   5. Outlier discussion
   6. What to do? Nonparametric alternatives
      1. Kruskal Wallis
      2. Mann-Whitney U
      3. Wilcoxon rank sum test
   7. Homogeneity
      1. Causes
4. Dealing with Heterogeneity
   1. Look at Levene’s test
   2. What to do?!
      1. Use a more stringent alpha
      2. Transform the data
      3. Switch test types
      4. Switch to single df tests