

Psychology 407
Assignment F

Suppose we are testing four ways of teaching the oxidation-reduction method of balancing chemical equations. We randomly assign 80 students to one of four groups (group sample sizes are all 20). The dependent variable is the number correct in a test of 15 items.

Method	Group Mean
1	10.0
2	10.0
3	12.0
4	6.0

In the usual analysis of variance table, the mean square for error was 2.0.

a) Assume methods 1 and 2 are variations on one particular “modern” technique, method 4 is the “traditional” technique, and method 3 is a combination of the “traditional” and “modern” techniques. Using this substantive information, what would be a reasonable way to formulate the analysis in terms of planned comparisons? Carry out your formulation using confidence intervals and control the overall error rate with the Bonferroni method.

b) Assuming the overall F-test was significant, carry out a post-hoc analysis using Scheffé’s method to answer the same questions you investigated in (a) using planned comparisons. Compare the confidence intervals under both approaches.

(c) Develop confidence intervals for all pairwise differences between the means using the Tukey, Scheffé, and Bonferroni methods. Compare the size of the resulting confidence intervals.