Lab 3 – ANCOVA Martin Mroz 0532316

A study was conducted to determine whether teachers who have a humanistic philosophy are the best at dealing with behavior problems in the classroom. A total of 40 high school teachers from large city systems were used in the study, with three categories of teachers: humanists with control (Humanists), strict disciplinarians (Disciplinarians), and keepers of the behavior problems (Keepers). All classrooms had 30 students in them and the number of times each teacher sent a student to the office for disciplinary actions in the second half of the school year was recorded as "Trouble". Additionally, the number of days absent was used as a covariate factor (Absent).

Following the Shapiro-Wilk's test, the distribution of the dependent variable (Trouble) was found to be not normal, S-W = .904, df = 40, p < .003. However, since the sample size is large enough (N=40), ANOVA is robust enough to deal with this departure.

A one-way ANOVA was conducted to determine whether there was a significant difference among the three types of teachers. The analysis indicated there was in fact a difference, F(2,37) = 5.577, p < .008. Follow up tests were conducted, however Levenne's test indicated that there was not homogeneity of variance, L(2,37) = 14.403, p < .008. Therefore, Dunnett's C test was used as a post-hoc evaluation. It was found that only Humanists (M = 5.56) significantly discipline their students less than Disciplinarians (M = 7.29).

Prior to analysis using ANCOVA, a preliminary ANOVA was conducted to evaluate the homogeneity-of-slopes assumption. This preliminary test showed that Absent and Trouble did not differ significantly as a function of Teacher, the factor, F(2,34) = .983, p < .385. Following this preliminary test, the ANCOVA was significant, F(2,36) = 5.207, p < .010, $\eta^2 = .224$. Using partial η^2 as grounds for assessment, the relationship between teaching philosophy (Teacher) and number of disciplinary actions (Trouble) was very strong, with Teacher account for 22.4% of the variance in Trouble while holding constant the number of days absent.

Table 1. Estimate marginal means or means adjusted for days absent. Covariates appearing in the model are evaluated at number of days absent = 3.55.

Teaching Philosophy	Mean
Humanist	5.583
Disciplinarian	7.291
Keepers	9.665

The Holm's Sequential Bonferroni procedure was used to preform follow up tests. The family wise alpha could not be set at an acceptable level using this procedure. Although follow up tests indicate that Humanists discipline less than Keepers (p < .003, which is smaller than Holm's, .05/3 = .0167), the significant difference between Disciplinarians and Keepers did not meet the requirements of Holm's Sequential Bonferonni (p < .032, which is larger than Holm's, .05/2 = .025). In order to achieve significant differences for both pairwise comparisons, the family wise alpha would need to be set at .064.