

Assignment 6 (Part II)
Due Monday, November 20, 2000 at 12:30 p.m. (with Part I)

1. In a test of the hypothesis that females smile at others more than males do, females and males were videotaped while interacting and the number of smiles emitted by each sex was noted. Using the following number of smiles in the 5-minutes interaction, test the null hypothesis that there are no sex differences in the number of smiles.

| Males | Females |
|-------|---------|
| 8 | 15 |
| 11 | 19 |
| 13 | 13 |
| 4 | 11 |
| 2 | 18 |

(Note: Make sure you write out the null hypothesis and the alternative or research hypothesis and tell me what kind of difference in means test you're going to do—two-tailed or one-tailed).

(Also, let's test this at $\alpha = 0.05$, i.e. is the t-value you obtain larger or smaller than the t-value associated with $\alpha = 0.05$ and the appropriate degrees of freedom? If it is, we can reject the null hypothesis. If it is not, we "fail to reject the null hypothesis, or accept the null hypothesis."

2. A researcher believes that alcohol intoxication even half the legal limit, that is, 0.05 blood alcohol instead of 0.10 might severely impair driving ability. To test this, he subjects 10 volunteers to a driving simulation test first while sober and then after drinking sufficient to raise the blood alcohol level to 0.05. The researcher measures performance as the number of simulated obstacles with which the driver collides. Thus, the higher the number, the poorer the driving. The obtained results are as follows:

| Before | After |
|--------|-------|
| 1 | 4 |
| 2 | 2 |
| 0 | 1 |
| 0 | 2 |
| 2 | 5 |
| 1 | 3 |
| 4 | 3 |
| 0 | 2 |
| 1 | 4 |
| 2 | 3 |

Test the null hypothesis that there is no difference in driving ability before and after alcohol consumption to the 0.05 blood alcohol level (use the 0.05 significance level).

→Note: this is a same-sample difference in means test—use the appropriate equations.

- Using Durkheim’s theory as a basis, a sociologist calculated the following suicide rates (number of suicides per 100,000, rounded to the nearest whole number) for 10 “high-anomie” and 10 “low anomie” metropolitan areas. Anomie (normlessness) was indicated by the presence of a large number of newcomers or transients in an area.

| High Anomie | Low Anomie |
|-------------|------------|
| 19 | 15 |
| 17 | 20 |
| 22 | 11 |
| 18 | 13 |
| 25 | 14 |
| 29 | 16 |
| 20 | 14 |
| 18 | 9 |
| 19 | 11 |
| 23 | 14 |

Test the null hypothesis that high-anomie metropolitan areas **do not have higher** (i.e. that they are less than or equal to) suicide rates than low-anomie areas. What do your results indicate?

- The antiblack prejudice (racism) of eight white young adults, all convicted of committing a hate crime, was measured both before and after they had seen a film design to reduce their racist attitudes. Using the following scores on an antiblack prejudice scale obtained by the eight subjects, test the null hypothesis that the film did not result in a reduction of racist attitudes. What do your results indicate? (Please use the 0.10 level of significance, i.e. $\alpha = 0.10$).

| Subject | Before | After |
|---------|--------|-------|
| A | 36 | 24 |
| B | 25 | 20 |
| C | 26 | 26 |
| D | 30 | 27 |
| E | 31 | 18 |
| F | 27 | 19 |
| G | 29 | 27 |
| H | 31 | 30 |