**Chapter 13**

**6.** The following data represent the results from an independent-measures study comparing three treatments.

a. Compute SS for the set of 3 treatment means. (Use the three means as a set of

 n = 3 scores and compute SS.)

b. Using the result from part a, compute n(SSmeans). Note that this value is equal to SSbetween (see Equation 13.6).

c. Now, compute SSbetween with the computational formula using the T values (Equation 13.7). You should obtain the same result as in part b.

Treatment

I II III

n = 10 n = 10 n = 10

M = 2 M = 3 M = 7

T = 20 T =30 T = 70

**10.** For the preceding problem you should find that there are significant differences among the three treatments. One reason for the significance is that the sample variances are relatively small. To create the following data, we started with the values from problem 9 and increased the variability (the *SS* values) within each sample.

I II III

*n* = 5 *n* = 5 *n* = 5

*M* = 2 *M =* 5 *M* = 8 *N* = 15

*T* = 10 *T* = 25 *T* = 40 *G* = 75

*SS* = 64 *SS* = 80 *SS=* 96 Σ*X*2 = 705

**a.** Calculate the sample variance for each of the three samples. Describe how these sample

variances compare with those from problem 9.

**b.** Predict how the increase in sample variance should influence the outcome of the analysis.

That is, how will the *F*-ratio for these data compare with the value obtained in problem 9?

**c.** Use an ANOVA with α = .05 to determine whether there are any significant differences

among the three treatment means. (Does your answer agree with your prediction in part b?)

**Chapter 16**

**8.** A professor in the psychology department would like to determine whether there has been a significant change in grading practices over the years. It is known that the overall grade distribution for the department in 1985 had 14% As, 26% Bs, 31% Cs, 19% Ds, and 10% Fs.

A sample of *n* = 200 psychology students from last semester produced the following grade distribution:

A B C D F

32 61 64 31 12

Do the data indicate a significant change in the grade distribution? Test at the .05 level of significance.

**10.** The color red is often associated with anger and male dominance. Based on this observation, Hill and Barton (2005) monitored the outcome of four combat sports (boxing, tae kwan do, Greco-Roman wrestling, and freestyle wrestling) during the 2004 Olympic games and found that participants wearing red outfits won significantly more often than those wearing blue.

**a.** In 50 wrestling matches involving red versus blue, suppose that the red outfit won 31 times and lost 19 times. Is this result sufficient to conclude that red wins significantly more than would be expected by chance? Test at the .05 level of significance.

**b.** In 100 matches, suppose red won 62 times and lost 38. Is this sufficient to conclude that red wins significantly more than would be expected by chance? Again, use α .05.

**c.** Note that the winning percentage for red uniforms in part a is identical to the percentage in part b (31 out of 50 is 62%, and 62 out of 100 is also 62%). Although the two samples have an identical winning percentages, one is significant and the other is not. Explain why the two samples lead to different conclusions.