EXERCISES

1. What feature of the matched-pairs design makes it
   a. an internally valid design?
   b. a powerful design?

2. A researcher uses a simple between-subjects experiment involving 10 participants to examine the effects of memory strategy (repetition vs. imagery) on memory.
   a. Do you think the researcher will find a significant effect? Why or why not?
   b. What design would you recommend?
   c. If the researcher had used a matched-pairs study involving 10 participants, would the study have more power? Why? How many degrees of freedom would the researcher have? What type of matching task would you suggest? Why?

3. An investigator wants to find out whether hearing jokes will allow a person to persevere longer on a frustrating task. The researcher matches participants based on their reaction to a frustrating task. Of the 30 original participants, 5 quit the study after going through the "frustration pretest." Beyond the ethical problems, what problems are there in using a matched-pairs design in this situation?

4. What problems would there be in using a within-subjects design to study the "humor-perseverance" study (discussed in question 3)? Would a counterbalanced design solve these problems? Why or why not?

5. Why are within-subjects designs more powerful than matched-pairs designs?

6. Two researchers hypothesize that spatial problems will be solved more quickly when the problems are presented to participants' left visual fields than when stimuli are presented to participants' right visual fields. (They reason that messages seen in the left visual field go directly to the right brain, which is often assumed to be better at processing spatial information.) Conversely, they believe verbal tasks will be performed more quickly when stimuli are presented to participants' right visual fields than when the tasks are presented to participants' left visual

fields. What design would you recommend? Why?

7. A student hypothesizes that alcohol level will affect sense of humor. Specifically, the student has two hypotheses. First, the more people drink, the more they will laugh at slapstick humor. Second, the more people drink, the less they will laugh at other forms of humor. What design would you recommend the student use? Why?

8. You want to determine whether caffeine, a snack, or a brief walk has a more beneficial effect on mood. What design would you use? Why?

9. Using a driving simulator and a within-subjects design, you want to compare the differences between driving unimpaired, driving while talking on a cell phone, and driving while legally intoxicated.
   a. Which order effects do you have to worry about? Why?
   b. To what degree would counterbalancing solve the problems caused by order effects?
   c. How would you try to prevent order effects from harming the validity of your study?

10. A researcher wants to know whether music lessons increase scores on IQ subtests and whether music lessons have more of an effect on some subtests (e.g., more of an effect on math than on vocabulary) than others.
    a. Would you make music lessons a between- or within-subjects factor? Why?
    b. Would you make subtests a between- or within-subjects factor? Why?
    c. If the researcher did an analysis of variance (ANOVA) on the data, the researcher would obtain three effects. Name those three effects.
    d. What effect would the researcher look for to determine whether music lessons increase scores on IQ subtests?
    e. What effect would the researcher look for to determine whether music lessons have more of an effect on math subtests than on vocabulary subtests?