

Name:

7-A Samples and Populations

1. Diener and Wallbom (1976) gave 28 University of Washington undergraduates an unsupervised test. They instructed the participants, who each took the test alone, to stop when the bell rang indicating time was up. Half of the participants had a mirror in the room and heard a recording of their own voice while they did the test.

- a) What was their sample?
- b) What was their intended population?
- c) Using the correct symbols, estimate their results.
- d) How could sampling bias influence their results?
- e) Are they using probability or statistics? Explain.

7-B Statistical Conclusions

2. Rosenthal and Jacobson (1966) randomly chose 20% of the children in a school and told their teachers that these children were likely to bloom that year. They measured all the children's IQ's at the time and again eight months later, with the prediction that children would increase more if their teachers expected them to do so.

- c) How many tails is their test?
- a) What is their alternate hypothesis?
- b) What is their null hypothesis?
- d) What would a type I error be for this study?
- e) What would a type II error be for this study?
- f) As predicted, they found that students who had been identified (randomly) as ready to bloom did in fact have a higher average increase in scores than other students. Why is this information alone not enough for them to reject their null hypothesis?

3. Calculate the following for the data set { 6, 1, 11, 18 }.

- a) Σx
- b) $\Sigma(x - \mu)$
- c) $\Sigma(x - \mu)^2$
- d) σ

4. Matthew measures the speeds of five random cars on Glenwood drive: 29, 35, 30, 32, 34 (in mph).

a) Calculate σ and explain what it means in this context.

b) Calculate s and explain what it means in this context.

c) Which value, σ or s , would be useful to Matthew? Explain.

7-C Experiments and Quasi-Experiments

5. Naomi is studying how eating breakfast affects academic success.

a) What is her independent variable?

b) What levels do you recommend she use?

e) Is her research experimental, quasi-experimental, or correlational?

c) What is her conceptual dependent variable?

d) How do you recommend she operationally define it?

f) If she rejects her null hypothesis, what will she be able to conclude?

g) Use Naomi's study to explain the concept *correlation does not imply causation*.

6. Fill in each blank with *a* or *e*.

a) What are music's ___ffects on people?

b) Is music an ___ffective form of therapy?

c) What ___ffect does music have on people?

d) What are the ___ffects of music on people?

e) Not everyone is ___ffected by music in the same way.

f) They hoped to find a significant ___ffect of music on mood.

g) Music may ___ffect people, but how strong are its ___ffects?

h) Confounding variables may ___ffect both music and mood together.

7-D Confounds

7. At the start of fall semester, I hypothesized that if I gave a surprise pizza party it would result in higher grades for the students. I brought in pizza, candy, and drinks for everyone in fifth period Statistics & Research Methods but not for third period Statistics & Research Methods. The following week I compared scores on the chapter test between the two periods.

a) Consider possible confounds that could result from preexisting differences between students in third period and students in fifth period.

b) Consider possible confounds that could result from differences, other than the pizza party itself, in what takes place in third period and what takes place in fifth period.

c) Consider possible confounds that could result from differences outside of class based on the fact that fifth period happens later in the day than third period.

d) Identify possible variables that may affect scores on the chapter test randomly and that are unlikely to affect one period significantly differently than the other.

e) It turned out that the average score in third period was 79% and the average score in fifth period was 82%. What can I conclude about the effect of pizza parties on academic success?

7-E Between-Participants and Within-Participants Designs

8. Genevieve is testing the effects of sugar on children's activity levels. In one condition she gives them regular soda, and in the other condition she gives them sugar-free soda.

a) How would she do this with a between-participants design?

b) How would she do this with a within-participants design?

c) What are some possible sequence effects?

d) Describe how you would recommend she do her study.