

MAT 135, Discussion Questions 1.22

1. How is cluster sampling different from stratified sampling?

in cluster sampling, clusters are chosen randomly and everyone in cluster is surveyed.
in stratified sampling, strata each have a small simple random sample done within.

2. Why does a convenience sample lead to biased results?

The people near you tend to be like you and so may not be representative of the general population

3. For each of the following variables, determine if they are: a) qualitative or quantitative, b) if it is quantitative, is it discrete or continuous, c) is the level of measurement nominal, ordinal, interval or ratio (give the highest level it could be).

- i. Temperature in Fahrenheit *quantitative, interval, continuous*
- ii. Numbers on soccer players' jerseys *qualitative, nominal*
- iii. Hair colour *qualitative, nominal*
- iv. GPA *quantitative, interval (or ordinal), continuous*
- v. Height of buildings *quantitative, continuous, ratio*
- vi. Degrees on a compass needle *quantitative, interval, continuous*
- vii. Age *quantitative, ratio (can be discrete or continuous)*
- viii. Time spent running a maze *quantitative, continuous, ratio*
- ix. Gender *qualitative, nominal*
- x. Skin cancer risk *quantitative, ratio, continuous*

4. What is the purpose of an institutional review board?

to protect subjects in an experiment

5. Give an example of a source of a study that would be considered

a. More credible

university, government entity, peer-reviewed journal
(for some topics) newspapers

b. Less credible

blog, Wikipedia, Twitter, (for some topics) newspapers

6. What could be a source of bias in a study? Given an example of one that could be controlled pretty easily, and one that might be harder to control for.

personal opinion, vested financial interest or political interest in outcome.

researcher knowledge in medical trials can be controlled in double blind studies; harder to control in educational studies when teachers must know techniques they are using.

7. Do you think that processing errors or non-adherence could affect some types of studies more than others? If so, how, what kinds? If not, why not?

non-adherence is a serious problem in long-term studies of almost any kind. Processing errors happen in all kinds of studies since they can be the result of human error.

non-adherence can be reduced through more careful monitoring.

8. What kind of things should we be careful about in conclusions of studies? (Think about clickbait headlines.)

funding source; making too strong a claim based on research that has not been replicated results that defy common sense (need more support)

9. Bring in a copy of a study from one of your previous courses or that you find online or in the library. Write a short paragraph critiquing the value of the study using what we learned in this chapter. What are some possible sources of bias in the study?

Answers will vary.

10. Give some specific examples of non-sampling errors.

non-response error (refusing to answer questions)

response error (not being able to predict one's own future behavior)

processing errors

Answers may vary

11. What are the key features of a matched-pairs experiment?

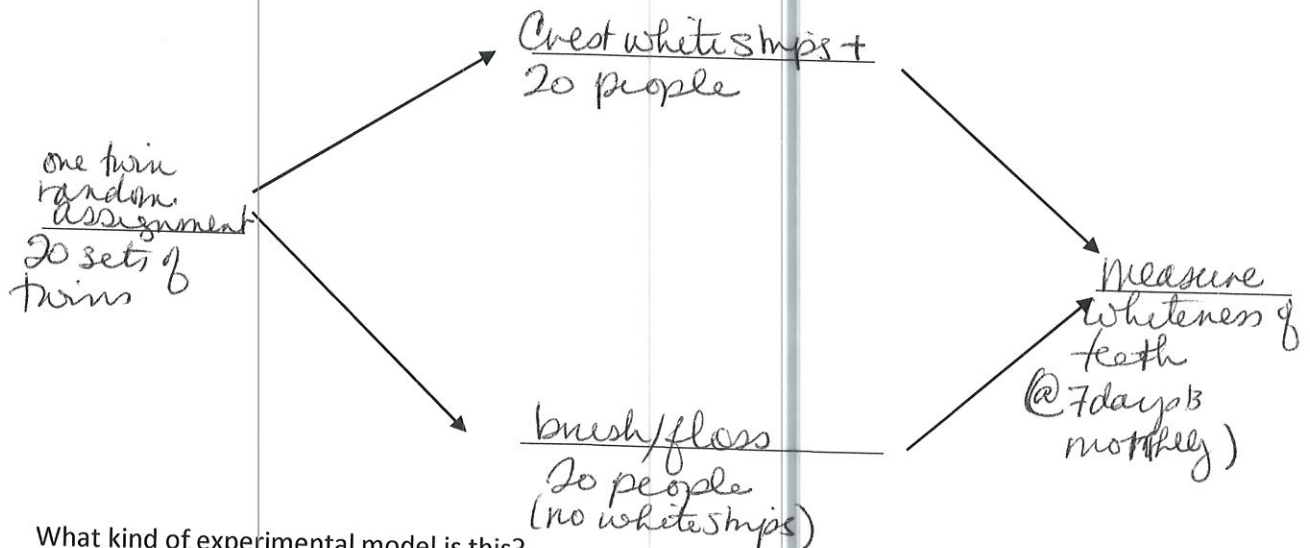
individuals in each group are matched to each other demographically as closely as possible to control for confounding. Matched-pairs may involve the same person being both halves of the pair.

12. How is a block design experiment different to or similar to a stratified sample?

the subjects are divided into groups/strata and then within that, randomly divided into groups for the study. Simultaneous experiments run on each strata.

13. An ad for Crest Whitestrips Premium claims that the strips will whiten teeth in 7 days and the results will last for 12 months. A researcher who wishes to test this claim studies 20 sets of identical twins. Within each set of twins, one is randomly assigned to use Crest Whitestrips Premium in addition to regular brushing and flossing, while the other twin is assigned to just regular brushing and flossing. Whiteness of teeth is measured at the beginning of the study, after 7 days and every month thereafter for 12 months.

Fill in the graph of the experimental design below. Note how are subjects assigned to groups, what treatment are the two groups receiving (and number in each group if available), and finally, what and how often the response variable will be measured.



What kind of experimental model is this?

no blinding,

controlled experiment

14. Read this article and be prepared to discuss it: <http://io9.gizmodo.com/how-the-nocebo-effect-can-trick-us-into-actually-dyin-1681746203>