

Study Types: Experimental vs. Observational

Scenario #1: Jordan is a social networking maniac! Although she prefers Facebook, she also spends a lot of time using Twitter, Pinterest, and Google+. She is curious as to which social networking site is the most preferred for her age group, so she decides to conduct a study. Jordan creates a survey to hand out to other students of her school. She plans to collect data from this survey and analyze the results to help her decide which social networking site is the most preferred.

1. Is this an experimental or observational study?

Scenario #2: Mario loves to listen to music, and is convinced that listening to music while taking a test helps him get higher test averages. To prove this, Mario conducts a study amongst his classmates in his AMDM class. With the permission of his teacher, he randomly selects 15 out of 30 students in his class to listen to music during their next test. The remaining 15 students (control group) are not allowed to listen to music while they take their test. He intends to compare the test scores from each group, hoping to prove his hypothesis that listening to music while taking a test increases test scores.

2. Is this an experimental or an observational study?

Do the following scenarios represent an observational study or an experimental study?

3. Mr. Denison announces a study session to be held the night before a test. The instructor lists the students who attended the session and compares their scores to the remaining Stat 113 students' scores.
obs

4. To determine whether a review session will improve his students' test scores, a Mr. Hybart divides his class into two groups. He then requires one group to attend a study session and compares the test results of each group.
exp

5. You want to compare the grades on a final math test of 25 students who chose to use calculators and 25 students who refused to use calculators. Your classmates decided which group they were in.
obs

6. A local government wants to compare voter satisfaction levels between people assigned to use either paper ballots or touchscreen machines.
exp

7. A major medical magazine wants to determine if people who take vitamin C every day are less likely to get colds.
obs

8. You want to determine which brands of orange juice people prefer. The people are randomly chosen at the supermarket and are asked to taste both brands without knowing which brand they are drinking.
exp

Study Types: Variable of Interest and Treatment

Variable of Interest is what it is that the researcher is studying. In the Mythbusters episode we watched recently, titled "No Pain No Gain," the variable of interest was pain tolerance. Note that it is not if a group did better or worse but only what was being tested.

In experimental studies there is also a treatment which is something that the research does or adds to the sample (observational studies do NOT have treatments). In the Mythbusters' "NO Pain No Gain" episodes the treatment was the ice bath.

9. What is the variable of interest in scenario 1 on the previous page?

Social media sites

10. What is the variable of interest in scenario 2 on the previous page?

test grades

11. What is the treatment in scenario 2?

music vs. no music

12. The severity of side effects experienced by patients while being treated with a particular medicine is under study. The severity is measured on a scale: none, mild, moderate, severe, and very severe. Identify the variable of interest:
severity of side effects

13. Students are being surveyed about the weight of books and supplies they are carrying to class. Identify the variable of interest:
weight

For each of the following examples determine

a. Observational or Experimental

b. Variable of Interest

c. If experimental, what were the treatments and how did the researcher decide who received the treatment

d. Identify any possible confounding variables.

14. Mrs. Johnson teaches American History and wanted to help her students do best on their exams. She wanted to see which format of tests students do better on. She flipped a coin for each student in her class. If the coin landed heads up, the student took a multiple choice test. If the coin landed tails up, the student received a fill-in-the-blank exam. Afterward, Mrs. Johnson compared the averages of the two test formats.

a. exp.

b. test grades

c. treatment = mc or fill in test
chosen by coin toss

d.

15. In World History, Mr. Lew had a similar question. He decided that instead of giving students different tests he would put a question on the bottom of the next test: "Which do you prefer, multiple choice or fill-in the blank questions?" Afterwards, Mr. Lew tallied the totals for each format.

- a. observational
- b. test grades
- c.
- d.

16. Mr. Mitchell was interested in the effects of music on student performance. At the bottom of one of his tests, he asked students to circle their favorite type of music: rock, country, or hip-hop. He then computed the averages of each test based on what genre of music they circled and compared results.

- a. observational
- b. student performance
- c.
- d.

17. Ms. Knox's senior English classes are working on theme papers. During 2nd period she allowed students to listen to music on their headphones while working but her 4th period class was required to work quietly without music. Ms. Knox averaged the grades and compared 2nd and 4th period's results.

- a. exp.
- b. grade on paper
- c. music
- d.