

Research Methods - Sample questions on experimentation

1. State what type of experimental design is employed in each of the following examples. You can use R-X-O notation or the formal name of the design. NO explanation or interpretation is necessary.

(a) A researcher wonders whether regular visits to the dentist prevent cavities. She finds a group of subjects who go to the dentist regularly and compares the number of cavities they have to the number of cavities among subjects who don't go to the dentist regularly.

(b) The new Provost of Notre Dame wants to bring more federal grant money into the university. To see what effect his policies are having, he plans to compare federal grant money at Notre Dame and Marquette (another major Catholic University, but one which has not recently changed Provosts) for each of the 5 years before and each of the 5 years after he takes office.

(c) A school wants to see how effective a new teaching procedure is. All students take an ability test at the beginning of the school year. Some students then volunteer to participate in the new program. At the end of the school year, all students are once again tested, and the scores of those in the program and those not in the program are compared.

(d) A corporation executive believes that his inspirational messages in the company newsletter increase productivity, and that the newsletter should therefore come out more often. The newsletter is published in February, April, June, August, October, and December. The executive compares productivity in January (which does not have a newsletter) with productivity in February (which does have a newsletter), then compares March's productivity with April's, etc.

(e) Fr. Murphy believes his sermons inspire greater charitable giving from his parishioners. However, some have suggested that more would be given if more people were still awake at the time the collection is taken. To see who is right, at some randomly selected masses the collection is taken up before the sermon, while at other randomly chosen masses the collection is taken after the sermon.

2. What is the main threat to internal validity that is present in each of the following situations? Write one or two sentences to justify your answer.

(a) The governor is running for reelection. He notes that the state's economy declined in each of the 4 years before he took office. In each of the 4 years since he took office, the state's economy has improved.

(b) President Bush fears that his press conferences are hurting him. Immediately before his last press conference, a random poll of 1500 Americans showed that 98% approved of the job he was doing as President. Immediately after his press conference, another random poll only gave him a 96% approval rating.

(c) An automobile company wants to test a new advertising campaign. The new ads are shown in a small number of representative cities, while the old ads are shown elsewhere. Several of the new ads are featured and discussed in a CBS news story about the automobile industry.

(d) A psychiatrist believes a new type of therapy may be highly beneficial. She randomly chooses half of her patients to receive the new therapy, while the other half receive the old therapy. At the end of six months, she evaluates the psychological fitness of all of her patients.

(e) The Mayor of South Bend wants to get students to stop drinking and driving on city streets. He intends to have a random sample of students fill out a questionnaire on their attitudes towards alcohol, then have them see a film on alcohol abuse, and then have them fill out the questionnaire again to see whether their attitudes have changed. He will do this all in one night, so as to eliminate any threats arising from "history." If attitudes do change for the better, he will ask Fr. Jenkins to require all students to watch the film when it is shown on public television.