Thinking Carefully About Experiments

Read the following example. Identify the extraneous or confounding variable.

A researcher wanted to assess whether mood influenced people's memory.  The researcher hypothesized that positive moods would lead to greater memory performance than would a negative mood state.  On Monday the researcher had 50 subjects learn a list of nonsense syllables and then watch a very humorous comedy film.  Their recall of the list of syllables was then assessed.  On Tuesday the researcher had a second group of 50 subjects learn the same list of nonsense syllables and then watch an upsetting documentary on World War II.  Their recall of the list was then assessed after having watched the film.

**A1.The confounding error is...because:**

A researcher wanted to see whether a new way of teaching English was superior to a more traditional approach.  The researcher selected two Thursday night classes at a local community college.  In one class the instructor used a traditional method, the second instructor used the newer approach.  The researcher then assessed students language ability after they had completed the program.

**A2. The confounding error is...because:**

***A3. Why is it important that researchers control for confounding variables?***

Dr. Imanut wants to examine whether a new drug increases the maze running performance of older rats.  Just like aging humans, older rats show signs of poorer memory for new things.  Dr. Imanut teaches two groups of older rats to find a piece of tasty rat chow in the maze.  One group of rats is given the new drug while they are learning the maze.  The second group is not given the drug.  One week after having learned the maze he retests the rats and records how long it takes them to find the rat chow.

1. What is the independent variable? a) age of the rats.

b) type of maze.

c) length of time it took the rats to run the maze.

d) presence or absence of the new drug.

2. What is the dependent variable?

a) age of the rats.

b) type of maze.

c) length of time it took the rats to run the maze.

d) presence or absence of the new drug.

A researcher wanted to know whether the number of people present would influence subjects' judgments on a simple perceptual task.  In each case the other members of the group gave an incorrect answer.  The researcher then noted whether the subject conformed to the group decision.

3. In the present study the independent variable was:

a) the number of people in the group.

b) whether the group members gave the correct or incorrect answer.

c) whether the subjects conformed with the group.

d) the type of perceptual task.

4. In the present study the dependent variable was:

a) the number of people in the group.

b) whether the group members gave the correct or incorrect answer.

c) whether the subjects conformed with the group.

d) the type of perceptual task.

An investigator had 60 subjects watch a videotaped re-enactment of a bank robbery.   Half of the subjects were asked by a police investigator to recall the event, while the remaining subjects were interviewed by a police investigator while they were hypnotized.

5. In the present study the independent variable was:

a) whether a police investigator was used.

b) whether subjects were hypnotized.

c) how much subjects recalled.

d) what subjects watched.

6. In the present study the dependent variable was:

a) whether a police investigator was used.

b) whether subjects were hypnotized.

c) how much subjects recalled.

d) what subjects watched.

7. Give an example of random assignment and explain why researchers use it.

8. Give an example of random selection and explain why researchers use it.

9. What is the difference between random assignment and random selection?

Think back to your hypothesis about the Autism Map. Write your hypothesis below:

What type of study would you use to test this hypothesis? Explain why this method would be better than all of your other options.

Thinking Carefully About Experiments Answer Key

Be sure you have tried to answer the questions on your own before checking your answers! There will be a quiz, so you want to complete the practice questions and then use the answer key to catch your misconceptions and figure out what you need to study and ask questions about.

A1. The experiments were conducted on different days of the week, which could be a confounding variable.

A2. The classes were taught by two different instructors, which could be a confounding variable.

A3. If researchers don’t control confounding variables, it is unclear if the results are due to the change in the independent variable from one condition to the next, or if they are due to other factors that are also different from one condition to the next.

1. D

2. C

3. A

4. C

5. B

6. C

7. If testing the effects of a new drug, a researcher could use random assignment to randomly pick some of the participants to be in the experimental group (taking the drug) and some to be in the control group (taking a placebo). Researchers use random selection to reduce the number of confounding variables between groups. For example, if researchers divided the groups by some particular factor, like males in one group and females in another, this factor would be a second difference between the groups and would become a confounding variable. Even asking for volunteers could become a confounding variable, because there may be something different about the people who are likely to volunteer vs. people who are not.

8. If testing the effects of a new learning program on student grades, Ms. Lockhart could assign all students a number, and then use a random number generator to randomly pick numbers. Students with those numbers would become a part of the experiment. Researchers use random selection to pull a sample of people from a population. The purpose of random selection is to get a sample that is representative of the population. For example, if Ms. Lockhart used another criteria (like pulling all 9th graders or pulling the AP Psych students) to select her sample, there would be confounding variables because her sample would not represent the entire population. (9th graders may not learn in the same way as 12th graders, and AP Psyc students probably have different interests and skills than students who do not choose that class.)

9. Random selection happens FIRST. In random selection, researchers randomly select a SAMPLE from the POPULATION. The goal is to select a sample of participants that is representative (meaning it is similar to or matches) the population being studied.

Random assignment happens SECOND and is used when there is an EXPERIMENTAL and a CONTROL group. Random assignment is used to randomly place people from the sample into the experimental and control groups. The goal of random assignment is to reduce confounding variables between the two groups.