

ISS 305:002
Evaluating Evidence:
Becoming a Smart Research Consumer

9. Establishing Causal Relationships

Reminder: Turn on your I<CLICKER

ISS 305: Mini-quiz Question 1

Why does correlation not equal causation?

- A) You do not know the direction of the effect.
- B) It could be due to chance.
- C) There could be a third variable that is responsible for the relationship.
- D) All of the above are reasons why correlation does not equal causation.

PSY 101: Mini-quiz Question 2

A **statistically significant correlation of +0.70** between children's physical height and popularity among their peers indicates that:

- A) higher levels of popularity among peers is associated with greater physical height in children.
- B) there is no statistically significant relationship between children's height and their popularity.
- C) being unusually short or tall has a negative impact on children's popularity.
- D) children's height causes negative popularity.

The New York Times

November 7, 2012

ISS 305: Mini-quiz Question 3

A Bad Trip for Democrats

By ED GOGEL

Ed Gogel is an addiction psychiatrist.

PRESCOTT, Ariz.

But Democrats should think twice about becoming the party of pot.

It sends the message that weed is harmless, even though research shows that teenagers who use it regularly do worse in school, are twice as likely to drop out and earn less as adults. Teenage use has been shown to permanently lower IQ.

What's wrong with Ed Gogel's argument against the legalization of pot?

- A. He draws a causal inference (that smoking pot causes decreases in IQ) from an association/relationship.
- B. His face is what's wrong with this argument.
- C. Both A & B are correct answers.
- D. Nothing; the evidence he cites does justify the conclusion that "Teenage use (of pot) has been shown to permanently lower IQ."

The New York Times
November 7, 2012

ISS 305: Mini-quiz Question 4

A Bad Trip for Democrats

By ED GOGEK *Ed Gogek is an addiction psychiatrist.*
PRESCOTT, Ariz.

Take, for example, medical marijuana laws. They were sold to more than a dozen states with promises that they're only for serious illnesses like cancer. It's possible that they all really do need pot to help them. But consider this: pain patients are mostly female, whereas a recent National Survey on Drug Use and Health found that adult cannabis abusers were 74 percent male.

What's wrong with Ed Gogek's argument against the legalization of pot?

- His inference of no relationship between being a pain sufferer and being a pot user relies on the marginal error.
- He uses a measure of having pain with low face validity (namely, measuring having pain with gender).
- Both A & B
- Nothing; the evidence he cites shows that there's no relationship between being a pain sufferer and a pot user

ISS 305: Mini-quiz Question 5

One can confidently conclude that A causes B when

- the relationship between A and B is statistically significant
- the relationship between A and B is a very strong one
- the sample upon which the observations have been made are large and representative
- there's no other obvious explanation for the relationship
- none of the above

ISS 305: Mini-quiz Question 6

I'd look at examples in your readings and lecture notes to determine when you have a spurious relationship. For now, which of the following is **NOT** an example of a spurious relationship?

- The relationship between ice cream consumption and drowning deaths in Minnesota.
- The relationship between poor sanitation and the contraction of pellagra.
- The relationship between poor readers and irregular eye movements.

ISS 305: Mini-quiz Question 7

An experiment is

- any study that establishes relationships between variables.
- a scientific study conducted in a laboratory.
- a method of observation that permits causal inference.
- just another name for a study.

ISS 305: Mini-quiz Question 8

Low generalizability is one limit of experimental research. Another is that

- A) you cannot test for interactions.
- B) you cannot infer causality.
- C) experiments are always cheap and therefore not good.
- D) None of the above are limitations to experimental research.

ISS 305: Mini-quiz Question 9

Random assignment is the great equalizer in terms of extraneous variables. Well, that's the hope anyways.

- A) True
- B) False

ISS 305: Mini-quiz Question 10

Some smokers will be given Nicorette for one week; they will be compared with other smokers not given any Nicorette. The independent variable in this experiment is

- A. whether or not participants are given Nicorette.
- B. how many cigarettes each participant smoked during the week before the experiment began.
- C. how many cigarettes each participant smoked after the week after the experiment ended.
- D. There is not an independent variable.

ISS 305: Mini-quiz Question 11

Some smokers will be given Nicorette for one week; they will be compared with other smokers not given any Nicorette. The dependent variable in this experiment is

- A. whether or not participants are given Nicorette.
- B. how many cigarettes each participant smoked during the week before the experiment began.
- C. how many participants quit smoking.
- D. Both B and C are correct.

ISS 305: Mini-quiz Question 12

Some smokers will be given Nicorette for one week; they will be compared with other smokers not given any Nicorette. If random assignment was used

- A. the average number of cigarettes a day each participant smoked before the study began should be roughly equal.
- B. you wouldn't be able to establish causality.
- C. it wouldn't be a true experiment.
- D. Both B and C are correct.

ISS 305: Mini-quiz Question 13

To achieve internal validity we must have ____ and ____.

- A)Random Assignment; Causality
- B)Control over extraneous variables; Causality
- C)Random Assignment; Luck
- D)Random Assignment; Control over extraneous variables

ISS 305: Mini-quiz Question 14

Internal validity equals generalizability.

- A)True
- B)False

ISS 305: Mini-quiz Question 15

A "history" threat to causal inference in a pretest/posttest design means

- A. there are older studies that find no evidence for a causal relationship between the independent variable (IV) and dependant variable (DV).
- B. the experimenter and one of the participants were involved in multiple rap battles in the past – they "have history".
- C. something relevant to the dependent variable besides the independent variable occurred between pretest and posttest.
- D. the pretest was omitted by mistake.

ISS 305: Mini-quiz Question 16

Regression to the mean predicts that

- A. the children of very tall basketball players will, on average, be shorter than their parents.
- B. the children of very short jockeys will, on average, be shorter than their parents.

ISS 305: Mini-quiz Question 17

You are testing a new treatment for alcoholism—a drug that makes people very sick when they ingest alcohol. You measure people’s drinking habits, have them take this drug for 6 weeks, and measure their drinking habits again after 6 weeks. The most severe alcoholics drop out of the study before 6 weeks. This is an example of:

- A)Regression to the mean
- B)Attrition
- C)Maturation

ISS 305: Mini-quiz Question 18

Which is **NOT** true?

- A)You can have external validity without internal validity.
- B)You can have internal validity without external validity.
- C)You can have external validity only if you have internal validity.

Generalizability Example

The Ford Motor Company would like to re-evaluate their selection program for auto mechanics at Ford dealers. An industrial/organizational psychologist develops a mechanical aptitude test designed to predict job performance. To test this potential selection criterion, all of the names of mechanics employed by Ford for at least the last three years were entered into a random drawing. Based on this drawing, 200 of the mechanics were chosen to take the aptitude test. Supervisory ratings on a scale from 1 to 10 (where 10 = best possible performance) from the most recent annual evaluation were used as a measure of job performance. The psychologist divided the 174 mechanics that completed the aptitude test by the due date into two groups based on their aptitude test score: one group of high scorers (those who scored at or above the 50th percentile) and one group of low scorers (those who scored below the 50th percentile). She then compared the supervisory ratings of these two groups.

ISS 305: Mini-quiz Question 19

To what population of people can you statistically generalize?

- A) All mechanics employed by Ford for at least the last 3 years.
- B) All mechanics employed by Ford.
- C) All auto mechanics.

Research report example #1:

Ed Gogek, upset that he got called out about his correlation study showing a relationship between marijuana use and lower IQ, decides to do his own study on the effects of marijuana on IQ. He comes to the first day of the Spring 2015 ISS305 class (not taught by Dr. Weaver) and gives everyone in the class last semester's Exam #4 (from Dr. Weaver's class). Then, because he would like to show that marijuana can hurt the IQ of even the poorest students, he identifies the 10 students who did worst on the exam. They got an average score of 15 items right (out of the 50 items on the exam). Then, every class afterwards, he put 10 small platters on a table in the front of the ISS305 classroom. On each platter was the name of one of the ten students, a large marijuana laced brownie, and a steaming cup of coffee. A sign over the table said "If you see your name on a platter, help yourself." At the end of the Spring 2014 semester he gets the scores of everyone on the regular Exam #2. Of the original ten students who had scored most poorly, the average of the 6 (who hadn't dropped the course) was 25. Ed reluctantly concluded that rather than hurting IQ, marijuana actually seemed to raise IQ. He said, "I guess I should have known that marijuana wasn't harmful since a majority of voters in Colorado and Washington just voted to make it legal."

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Mini-quiz Question: 20

In this study, which of the following is confounded with the independent variable?

- A) ingested marijuana
- B) gender
- C) ingested caffeine
- D) knowledge of ISS305 material

Research report example #2:

Tobias Fünke, a famous actor and experimental psychologist, decided to conduct a study on helping behavior. He hypothesized that each sex would only help people of the opposite sex, not the same sex. Further, he suspected that help would only be given when the need is great. He hired two confederates, Ann Veal (an 18 year-old White Female undergraduate student) and Carl Weathers (a 65 year-old Black Male retiree). Participants were 1,040 White students. In the low-need condition one of the confederates would stagger out of a room with 5.2 ounces of ketchup on his/her shirt, screaming "Help!". In the high need condition, there was 6.2 ounces of ketchup displayed. Participants reported one at a time to the laboratory and took a seat in the waiting room. The sex of the confederate and his/her level of need was randomly determined. Resulting in 130 participants in each condition (2 [Sex of confederate] x 2 [Sex of P] x 2 [level of help]). The chosen confederate then staggered into the waiting room. The other confederate observed the scene through a one-way mirror and rated how vigorously the participant helped on an 11 point scale. These interactions were also videotaped and the confederates were asked to rerate all the scenes which they had rated before. The mean average test-retest correlation for the two confederates was .96. Fünke finds that Ps helped a male victim (mean = 7.5) significantly more than a female victim (mean = 7.4), but amount of help needed had no effect.

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(Mini-Quiz) Question: 21

In this study, which of the following is **NOT** an independent variable?

- A) help given
- B) help needed
- C) sex of person needing help

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(Mini-Quiz) Question: 22

Which of the following variables is confounded with an independent variable?

- A) student/non-student status of the confederate
- B) race of the confederate
- C) age of the confederate
- D) all of the above

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(Mini-Quiz) Question: 23

What aspect of this study increases the chances of experimenter effects the most?

- A) the choice of students as subjects
- B) the use of a subjective rating by a confederate to measure helpfulness
- C) using a very unusual event (someone bleeding in a lab setting) to provide a context where help is needed
- D) randomly assigning Ps to experimental conditions

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(Mini-Quiz) Question: 24

What aspect of this study decreases the chances of selection biases the most?

- A) the choice of students as subjects
- B) the use of a subjective rating by a confederate to measure helpfulness
- C) using a very unusual event (someone bleeding in a lab setting) to provide a context where help is needed
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(Mini-Quiz) Question: 25

What aspect of this study increases the chances of demand characteristics the most?

A) the choice of students as subjects

B) the use of a subjective rating by a confederate to measure helpfulness

C) using a very unusual event (someone bleeding in a lab setting) to provide a context where help is needed

D) randomly assigning Ps to experimental conditions