

Matching Review

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|------|-------|
| 1. B | 8. A |
| 2. D | 9. B |
| 3. A | 10. C |
| 4. D | 11. C |
| 5. A | 12. D |
| 6. C | 13. C |
| 7. B | 14. A |

Name _____

Statistics Chapter 10: Review

Multiple Choice Questions – Chapter 10

1. A company sponsoring a new Internet search engine wants to collect data on the ease of using it. Which is the best way to collect the data?
A) census B) sample survey C) observational study D) experiment
2. A researcher wants to compare the effect of a new type of shampoo on hair condition. The researcher believes that men and women may react to the shampoo differently. Additionally, the researcher believes that the shampoo will react differently on hair that is dyed. The subjects are split into four groups: men who dye their hair; men who do not dye their hair; women who dye their hair; women who do not dye their hair. Subjects in each group are randomly assigned to the new shampoo and the old shampoo. This experiment
A) has three factors (shampoo type, gender, whether hair is dyed).
B) has two factors (gender and whether hair is dyed) blocked by shampoo type.
C) has two factors (shampoo type and whether hair is dyed) blocked by gender
D) has one factor (shampoo type), blocked by gender and whether hair is dyed.
3. We wish to compare the average ages of the math and science teachers at your high school. Which is the best way to collect the data?
A) census B) sample survey C) observational study D) experiment
4. Does donating blood lower cholesterol levels? 50 volunteers have a cholesterol test, then donate blood, and then have another cholesterol test. Which aspect of experimental design is present?
A) randomization B) a control group C) blinding D) none of these *matching*
5. If we wish to compare the average PSAT scores of boys and girls taking AP* Statistics at this high school, which would be the best way to gather these data?
A) census B) SRS C) observational study D) experiment
6. Does regular exercise decrease the risk of cancer? A researcher finds 200 women over 50 who exercise regularly, pairs each with a woman who has a similar medical history but does not exercise, then follows the subjects for 10 years to see which group develops more cancer. This is a
A) survey B) retrospective study
C) prospective study D) randomized experiment
7. Does Procellera® Antimicrobial Wound Dressing help injuries heal faster? Researchers checked records of 38 patients who had been treated for acute or chronic wounds between 2010 and 2012. They found that those who had been treated with Procellera® healed almost twice as fast. This is a
A) survey B) retrospective study
C) prospective study D) randomized experiment

8. To check the effect of cold temperatures on the battery's ability to start a car researchers purchased a battery from Sears and one from NAPA. They disabled a car so it would not start, put the car in a warm garage, and installed the Sears battery. They tried to start the car repeatedly, keeping track of the total time that elapsed before the battery could no longer turn the engine over. Then they moved the car outdoors where the temperature was below zero. After the car had chilled there for several hours the researchers installed the NAPA battery and repeated the test. Is this a good experimental design?
- A) Yes
B) No, because the car and the batteries were not chosen at random.
C) No, because they should have tested more temperatures.
D) No, because temperature is confounded by brand.
9. Twenty dogs and 20 cats were subjects in an experiment to test the effectiveness of a new flea control chemical. Ten of the dogs were randomly assigned to an experimental group that wore a collar containing the chemical, while the others wore a similar collar without the chemical. The same was done with the cats. After 30 days veterinarians were asked to inspect the animals for fleas and evidence of fleabites. This experiment is...
- A) completely randomized with one factor: the type of collar
B) randomized block, blocked by species
C) randomized block, blocked by type of collar
D) completely randomized with two factors
10. Which is true about randomized experiments?
- I. Randomization more evenly distributes confounding variables.
II. Random assignment of treatments allows results to be generalized to the larger population.
III. Blocking can be used to reduce the within-treatment variability.
- A) I only B) II only C) I and III D) all three
11. More dogs are being diagnosed with thyroid problems than have been diagnosed in the past. A researcher identified 50 puppies without thyroid problems and kept records of their diets for several years to see if any developed thyroid problems. This is a(n)
- A) randomized experiment
B) survey
C) prospective study
D) retrospective study
E) blocked experiment
12. Double-blinding in experiments is important so that
- I. The evaluators do not know which treatment group the participants are in.
II. The participants do not know which treatment group they are in.
III. No one knows which treatment any of the participants is getting.
- A) I only B) II only C) III only D) I and II E) I, II, and III

13. Placebos are a tool for

- A) sampling B) blocking C) blinding D) control E) randomization

14. Which of the following is not required in an experimental design?

- A) blocking
B) control
C) randomization
D) replication
E) All are required in an experimental design.

15. Label each statement below with "E" for Experiment or "S" for Observational Study

- E a) Similar patients with high blood pressure are randomly given three different doses of a new drug and their blood pressure is observed.
S b) ACT test scores of school athletes and non-athletes are compared.
S c) A survey examines if doctors with different specialties have different stress levels.

16. An article in a local newspaper reported that dogs kept as pets tend to be overweight. Veterinarians say that a combination of both diet and exercise will help these chubby dogs get in shape.

The veterinarians propose two different diets and two different exercise programs:

- Diet A: owners control the portions of dog food and dog treats
Diet B: a mixture of fresh vegetables with the dog food and substitute regular dog treats with baby carrots.
- Exercise Plan 1: three 30-minute walks a week
- Exercise Plan 2: 20-minute walks daily.

Sixty dog owners volunteer to take part in an experiment to help their chubby dogs lose weight.

a. Identify the following:

the subjects:

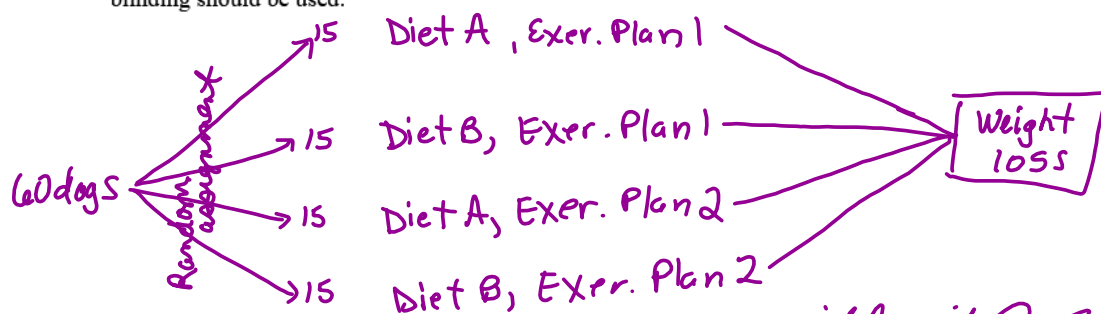
the factor(s) and the number of level(s) for each:

the number of treatments:

the response variable:

Chubby dogs
Diet (2) and Exercise (2)
4
Weight loss

b. Design an experiment to determine whether the diet and exercise programs are effective in helping dogs to lose weight. In your design, draw a diagram and identify how randomization and blinding should be used.



Blinding the subjects is not possible, if possible
Evaluator doesn't need to be blinded to take an unbiased weight.

17. A headline in a local newspaper announced, "Video game playing ^{causes} leads to better spatial reasoning abilities." The article reported that an observational study found "statistically significant differences" between teens who play video games and teens who do not, with teens who play video games testing better in spatial reasoning. As a statistician, do you think the headline was appropriate? Explain.

(X) No b/c we cannot determine cause and effect from an observational study.

18. A consumer group wants to see if a new education program will improve the spending habits of college students. Students in an economics class are randomly assigned to three different courses on spending habits.

a. What are the experimental units?

College students in econ. class

b. How many factors are there?

1 (educational program)

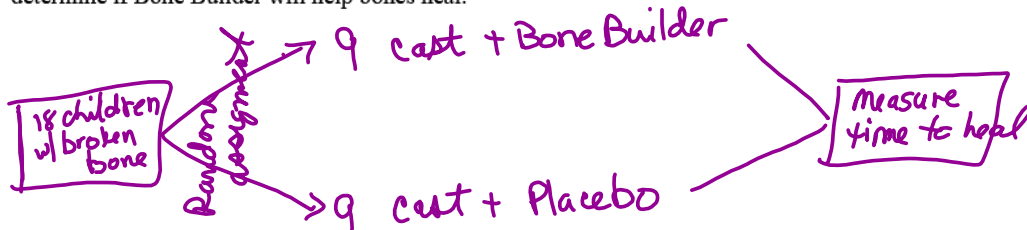
c. How many treatments are there?

3

d. What is the response variable?

Spending habit improvement

19. Researchers believe that a new drug called Bone Builder will help bones heal after children have broken bone. Bone Builder is to be used with traditional casts. To test the impact of Bone Builder on bone healing, the researchers recruit 18 children with bone breaks. Design an appropriate experiment to determine if Bone Builder will help bones heal.



Double-Blind Experiment. Bone growth will be monitored weekly to determine time to heal.

