Statistical Reasoning

Types of Studies Name: Date: Class:

TYPES of STUDIES

1. **Observational Study:**
Just collect data. Not interference with subjects. Researcher not able to control group assignment.
2. **Experimental Study:**
Assign groups and treatment. Use a control group. Attempts to understand a cause/effect relationship.
Treatment group:
group that actually gets the treatment.
Control group:
Group that does not gets the treatmunt.
Placebo:
fake treatment
Placebo effect:
subject thinks that a placebo is real / works
3. **Simulations:**
a way to model events so that outcomes are like real-world situations, but are safer.
4. **Census:**
a study that uses the whole population

Choose the type of Study that is most likely to be used ~~(each is used just once)~~.
(Exp) Experimental (SIM) Simulation (Cen) Census (Obs) Observational

Obs **a)** You want to know how many pets the teachers at Phoenix High School own.
(if all teachers = census)

Exp **b)** A drug is given to 15 patients and a placebo to another group to determine its effect on an illness.

obs **c)** You are doing a study at a mall in which you are counting the number of men that wash their hands after using the restroom.

Sim **d)** You want to know the g-forces a person would experience during a fall from a 90 foot high bridge into a lake.

obs **e)** You need data on the average number of hours worked per week by an American teenager with a part-time job.

ELEMENTS OF STUDIES

1. Variable:

a. **Variable of Interest:**
the variable that we collect data about

b. **Explanatory variable:**
the variable that explains/causes another to change (x-axis)

c. **Response variable:**
the variable that changes in response to another variable (y-axis)

d. **Confounding variable:**
unexpected variable that affects the relationship being studied

A mathematics teacher wanted to determine whether assigning homework had a beneficial effect on student academic performance. His class met at 2:00 in the afternoon and he obtained the cooperation of another teacher of the same class that met at 8:00 in the morning. He gave his class no homework while the other teacher continued to assign homework as he usually did. Both teachers gave the same tests so that they could compare the results.

a) Is the study observational or experimental?
experimental

b) What is the variable of interest?
test scores

c) What is the treatment?
HW

d) What is the explanatory variable?
HW or no HW

e) What is the response variable?
test score

f) Name some confounding variables?
smart kids, teachers, student business, HW like test, student motivation

g) Is this good experimental design? Why or why not?