EXAMPLE SECTION REPORT

MATH 12 // STATISTICS // SPRING 2019

This is an example of a section report that you can use to model your own reports. Here are the questions for the example.

Chapter 1, Section 4.

- Describe the two types of studies. What is the difference between them? Provide your own examples of each. Also, state which type of study was used in the following
  (a) A survey was taken to see how many times a person was asked for directions on the street
  (b) A study divided students up into two groups. The first group took a statistics class with Professor A and the second group took a statistics class with Professor B. At the end of the semester, the grades for Professor A's students were compared with those of Professor B.
- What are three kinds of variables? Describe each. Provide an example of a study and identify all the variables involved. In the following examples, describe the independent and dependent variables
  (a) A study was conducted to see if a servers tips increase if they drew a happy face on the check.
  (b) According to a British journal, the risk of catching the flu descrease by 35% if you exercised regularly.

On the next page, is an example of the corresponding section report.

Section Report: Chapter 1, Section 4

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Part 1.

There are two types of studies used in experimental design: oberservational and experimental. In an *observational study*, the researchers observe what is happening or has happened. Conclusions are drawn from their observations. For example, when Jane Goodall studies chimpanzees, she is conducting an observational study. She does not interact with the chimps. Instead, she merely sits back and documents their behavior.

On the other hand, in an *experimental observation*, the researchers manipulate one of the variables in an effort to determine how this manipulation influences the other variables. An example of this is a typical drug trial, where a chemist will give different amount of a drug to a patient to see how they react. Different amounts of drugs are given to different patients to determine the quanitity of a drug required to make it effective.

Here are some additional examples

(a) A survey was taken to see how many times a person was asked for directions on the street.

    This is an observational study. We are not trying to influence the number of times an individual is asked for directions. We merely ask them how many times it occurs.

(b) A study divided students up into two groups. The first group took a statistics class with Professor A and the second group took a statistics class with Professor B. At the end of the semester, the grades for Professor A's students were compared with those of Professor B.

    This is an experiemental study. In trying to determine the better teacher, we purposely placed students into each professor's class. Because we controled the students who went into each class, this is an experiment.

Part 2.

The three kinds of variables are independent, dependent, and confounding. The independent and dependent variables are best explained in terms of how they relate to each other. Indeed, in a statistical study, the quantity described by the independent variable determines (or at least we seek to determine if this is so) the quantity of the dependent variable. For example, suppose we want to study the relationship between a persons diet and weight. Here, the diet is independent variable and the weight is the dependent variable. That is because we believe that diet affects weight, but the reverse is not true.

The third type of variable is the confounding variable. This can influence the dependent variable, but cannot be separated from the independent variable. Continuing from the diet versus weight example, a person's neighborhood can be a

confounding variable. This is because where one lives can determine their diet. This occurs if they live in a place without access to fresh and healthy food.

Here are some other examples of independent and dependent variables.

(a) A study was conducted to see if a servers tip increased if they drew a smiling face on the check. In this study, the independent variable is the drawing of the smiling face and the dependent variable is the tip received.

(b) According to a British journal, the risk of catching the flu decreases by 35% if you exercised regularly. This journal describes engaging in exercise as the independent variable and the risk of catching the flu as the dependent variable.