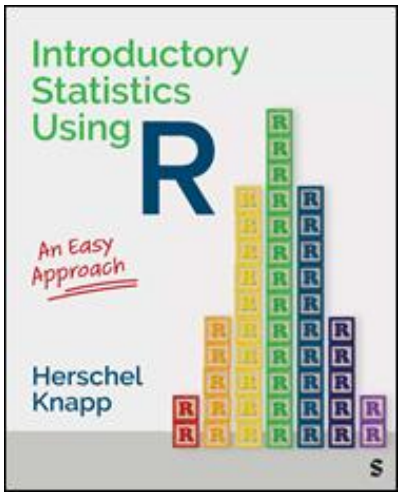
Introductory Statistics Using R 1st edition Knapp Solutions Manual

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Chapter 1

Research Principles

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NOTE: It is not expected that your answers will match the solutions verbatim or that your methods will be identical, but they should concur conceptually.

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Exercise 1.1

a. The director could recruit a group of volunteers and randomly assign half of them to the treatment group (they'd get the guided meditation) and the rest would be assigned to the control group (they'd get no meditation), and the director would record the pulse rates of all of the people after 30 minutes in both groups for comparison.

b. Does 30 minutes of guided meditation have an effect on the resting pulse rate?

c. H_0: 30 minutes of guided meditation has no effect on the resting pulse rate.
H_1: 30 minutes of guided meditation has an effect on the resting pulse rate.

Exercise 1.2

a. The magician will visit patients in the even-numbered rooms in the pediatric ward, which will constitute the treatment group; the patients in the odd-numbered rooms, who don't get the magic performance, will be in the control group. The pediatrician will gather anxiety scores (e.g., 1 = low anxiety… 5 = high anxiety) from all of the pediatric patients.

b. Does a bedside magic performance for hospitalized pediatric patients have an effect on their anxiety?

c. H_0: The magician's performance has no effect on patient anxiety.
H_1: The magician's performance has an effect on patient anxiety.

Exercise 1.3

a. The control group would be the 7^{th} graders, and the experimental group would be the 8^{th} graders (or vice versa).

b. Is there a difference between the heights of 7^{th} graders and 8^{th} graders?

c. H_0: There is no difference between the heights of 7^{th} graders and 8^{th} graders.
H_1: There is a difference between the heights of 7^{th} graders and 8^{th} graders.

Exercise 1.4

a. The control group could be the in-class students and the experimental group could be the online students (or vice versa).

b. Does in-person classroom teaching produce the same grades as live online?

c. H_0: In-person classroom students perform the same as live online students.
H_1: In-person classroom students do not perform the same as live online students.

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Exercise 1.5

a. The control group could be the employees at one site that do not get the free lunch Friday offer, and the treatment group could be the employees who work at the other site that do get the free-lunch-Friday offer.

b. Does rewarding employees who arrived on-time all week with free-lunch-Friday effect lateness?

c. H_0: Free-lunch-Friday for punctual employees has no effect on lateness.
H_1: Free-lunch-Friday for punctual employees has an effect on lateness.

Exercise 1.6

a. The principle can randomly enroll half of the students in a music class – they would be the experimental group; the rest of the students will not get music class – they would be the control group.

b. Do students enrolled in a music class have the same math scores as students who are not in a music class?

c. H_0: Students enrolled in a music class have the same math scores as students who are not enrolled in a music class.
H_1: Students enrolled in a music class do not have the same math scores as students who are not enrolled in a music class.

Exercise 1.7

a. The nurse could use a coin-flip to populate the control / experimental groups: Heads assigned a patient to the experimental group (they would get aroma therapy) and tails assigns the patient to the control group (they would not get aroma therapy).

b. Does aroma therapy have an effect on patient's level of stress?

c. H_0: Aroma therapy has no effect on the patient's level of stress.
H_1: Aroma therapy has an effect on the patient's level of stress.

Exercise 1.8

a. The farmer milks half of the cows in the north barn with no music playing – this would be the control group. The rest of the cows are milked in the south barn with classical music playing – this would be the experimental group.

b. Does classical music affect the amount of milk cows produce?

c. H_0: Classical music does not affect the amount of milk cows produce.
H_1: Classical music does affect the amount of milk cows produce.

Exercise 1.9

a. The public school students could be in the treatment group and the private school students could be in the control group (or vice versa).

b. Are public school students and private school children equally skilled in the number of times they can jump rope?

c. H_0: There is no difference in public school students and private school students jump rope skills.
H_1: There is a difference in public school students and private school students jump rope skills.

Exercise 1.10

a. The manager can randomly select the room for the control group – they'll continue working as usual. The other room will get the muted classic cartoons on a big screen.

b. Do the cartoons have an effect on employee morale?

c. H_0: Classic cartoons have no effect on employee morale.
H_1: Classic cartoons have an effect on employee morale.