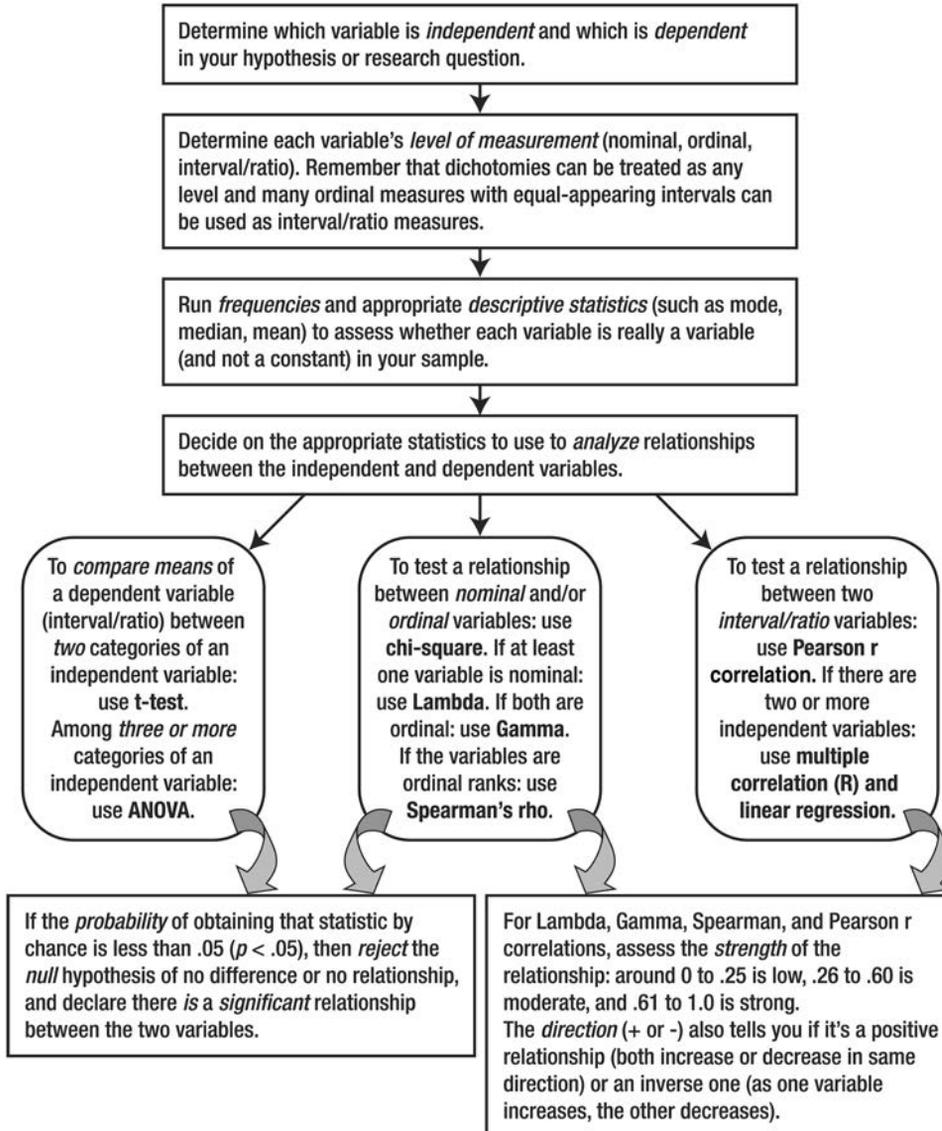


# appendix

## Statistical Analysis Decision Tree



## ANSWERS FOR “TEST YOURSELF” EXERCISES

### Chapter 1

1. Before you can conclude cause and effect, you must determine that (a) there is a significant relationship between the variables, (b) the cause (independent variable) came before the effect (dependent variable) in time, and (c) alternative explanations or causes have been ruled out.

2. The article provides several examples, but begin by asking whether there are any significant statistical relationships between autism and vaccines in the scientific literature. If so, did autism show up before or after the vaccines? If it did, then ask what other possible causes could be at work, such as nutrition, urban pollution, genetics, family history of illnesses, and so forth.

3. Common everyday thinking at work in these situations is anecdotal evidence. People hear stories from other concerned parents and see media reports about autism, especially on numerous blogs and other websites. Anxieties about their children often lead parents to seek any explanation that brings them some comfort, especially when ambiguity is present. Scientific studies would require replication among different populations, controls for alternative explanations, and establishment of a timeline of causes and effects.

### Chapter 2

1. Because individual names can be linked to code numbers, this is no longer an anonymous survey. It's up to the researchers then to maintain confidentiality and ethically not to disclose specific answers for individual respondents.

2. These guiding principles—autonomy, beneficence, and justice—are defined at the end of the chapter. Try to apply these to an actual research topic, like studying drug use on campus.

3. Discuss how imagination can apply to generating new ideas, like serendipity. Or consider how, when reading other research findings, you creatively come up with an idea based on those findings. Use your imagination, in other words, to answer this question too!

### Chapter 3

1. There is no relationship between education level (1 = high school graduate, 2 = some college, 3 = college graduate, 4 = graduate school) and scores on a scale measuring life satisfaction (scores range from 1 to 10, where 10 = highly satisfied with one's life).

	Which Variable?	Level of Measurement?	Type of Hypothesis?
Independent variable	Educational level	Ordinal	Null, two-directional
Dependent variable	Life satisfaction	Interval/ratio	

2. Men are more likely to receive higher hourly wages than women.

	Which Variable?	Level of Measurement?	Type of Hypothesis?
Independent variable	Sex	Nominal (dichotomy)	One-directional
Dependent variable	Hourly wages	Interval/ratio	

3. There is a relationship between ethnicity/race and political party affiliation.

	Which Variable?	Level of Measurement?	Type of Hypothesis?
Independent variable	Ethnicity/race	Nominal	Two-directional
Dependent variable	Political party affiliation	Nominal	

## Chapter 4

1. Responses are not mutually exclusive (“5 times” appears twice) and not exhaustive (there’s no option for “none” or “more than 7 times”).

2. This is a double-barreled question. What if you don’t watch sitcoms but only watch dramas? “And” indicates two questions in one.

3. There is no branching. When respondents answer no, they should be told to skip question b.

4. “Yes” and “no” responses don’t capture the intensity of opinion (perhaps options should range from “strongly agree” to “strongly disagree”), and invoking a scientific authority indicates a possible loaded question, resulting in agreement.

## Chapter 5

1. Quota nonprobability.
2. Convenience nonprobability.
3. Systematic random.
4. Snowball.

## Chapter 6

1.

	Statistic	Graph/Chart
a. Number of text messages sent per day	Mean	Histogram or frequency curve
b. Race/ethnicity	Mode	Pie or bar
c. Skewed number of hours studied in the past week	Median	Histogram or frequency curve
d. Type of car owned	Mode	Pie or bar

2. a. The mean, median, and mode are approximately the same, suggesting a normal curve.
- b. Use the normal curve distribution in Figure 6.7 to answer these questions.
- 68 percent.
  - Under 63.3 inches.
  - 50 percent.
  - Two-tailed, so either taller than about 75.3 inches or shorter than 59.3 inches.
  - Between 59.3 and 75.3 inches.

## Chapter 7

1. There is no relationship between high school grades (GPA) and college grades (GPA).

	Which Variable?	Level of Measurement?	Which Statistic to Use?
Independent variable	High School GPA	Interval/ratio	Pearson r
Dependent variable	College GPA	Interval/ratio	

2. There is no relationship between type of car owned and region of the country (rural or urban).

	Which Variable?	Level of Measurement?	Which Statistic to Use?
Independent variable	Region of country	Nominal	Lambda, chi-square
Dependent variable	Type of car owned	Nominal	

3. There is no relationship between the Top 20 football rankings this year compared with these rankings last year.

	Which Variable?	Level of Measurement?	Which Statistic to Use?
Independent variable	Last year's rankings	Ordinal	Spearman's rho
Dependent variable	This year's rankings	Ordinal	

4. There is no relationship between age (measured as “under 18,” “18 to 25,” “26 to 33,” “34 to 41,” and “42 and older”) and number of times using Twitter per day (measured as “none,” “1 to 5 times,” “6 to 10 times,” “11 or more times”).

	Which Variable?	Level of Measurement?	Which Statistic to Use?
Independent variable	Age groups	Ordinal	Gamma, chi-square
Dependent variable	Times using Twitter	Ordinal	

## Chapter 8

1. a. F-test ANOVA.
  - b. Paired samples t-test.
  - c. Independent samples t-test.
2. a. Because the survey is comparing average attitude scores on an equal-appearing interval Likert scale between two independent groups (college versus no college).
  - b. The Levene test tells us whether or not the variances for each group are equal. In this case,  $F$  is significant, so reject the null of no difference in variances and conclude that equal variances are not assumed. The variances are different for each group.
  - c. Therefore, you look at the  $t$ -value for “equal variances not assumed,” that is, 12.205.
  - d. Given a  $t$ -value of 12.205, with almost 710 degrees of freedom, we see the significance level is  $p < .001$ , so we reject the null hypothesis and conclude there is a difference in mean attitudes toward classical music between those who have a college degree and those who do not have a college degree.
  - e. College grads are more likely to like classical music (with an average of 2.06 where 1 = like very much).

## Chapter 9

1. Significant independent variables in order of strength are highest year of school completed, then age of respondent (respondent's sex is not statistically significant).

2. The multiple correlation of the three independent variables together (including the nonsignificant one) with the dependent variable is 0.161. It is a weak correlation.  $R^2$  tells us the PRE: 2.6 percent of the variation in respondents' general happiness can be explained by the independent variables.

3. Those who are closer to 1 on the happiness scale (that is, those who are happier) tend to be older and have more education (the negative Beta coefficients indicate low scores on the happiness scale). The happiest have high scores on the age and education measures; that is, they are older and have more years of schooling.

## Chapter 10

There is no one right answer for this one, yet be sure to consider the following items for each audience:

1. Include what the 0.65 indicates, such as very strong correlation, and its  $R^2$  interpretation (42 percent of reasons why they volunteer relate to beliefs in social justice). Explain why a Pearson  $r$  was used (two interval/ratio measures).

2. Focus on the connection between attitudes and action, between what people say they believe and how that translates into behavior.

3. Argue for the importance of these shelters and how there is a strong relationship to values of social justice, thereby enhancing the city council's values.

4. Here you can express your personal opinions about social justice and even focus on why there isn't a stronger correlation between what people believe and how they carry out their beliefs.

5. As research suggests, putting social justice into action can mean volunteering at a homeless shelter near you. So do something today.