power of 0.80, and the alternative proportion of 0.4, technology such as Minitab is used to find that the required minimum sample size is 153. The researchers can then proceed by obtaining a sample of at least 153 randomly selected subjects. Due to factors such as dropout rates, the researchers are likely to need somewhat more than 153 subjects. (See Exercise 37.)

8-2 Basic Skills and Concepts

Statistical Literacy and Critical Thinking

1. M&Ms and Aspirin A package label includes a claim that the mean weight of the M&Ms is 0.8535 g, and another package label includes the claim that the mean amount of aspirin in Bayer tablets is 325 mg. Which has more serious implications: rejection of the M&M claim or rejection of the aspirin claim? Is it wise to use the same significance level for hypothesis tests of both claims?

2. Estimates and Hypothesis Tests Data Set 20 in Appendix B includes sample weights of the M&Ms referenced in Exercise 1. We could use methods of Chapter 7 for making an estimate, or we could use those values to test some claim. What is the difference between estimating and hypothesis testing?

3. Mean Body Temperature A formal hypothesis test is to be conducted using the claim that the mean body temperature is equal to 98.6°F.

a. What is the null hypothesis, and how is it denoted?

b. What is the alternative hypothesis, and how is it denoted?

c. What are the possible conclusions that can be made about the null hypothesis?

d. Is it possible to conclude that "there is sufficient evidence to support the claim that the mean body temperature is equal to 98.6°F"?

4. Interpreting *P*-value When the clinical trial of the XSORT method of gender selection is completed, a formal hypothesis test will be conducted with the alternative hypothesis of $p > 0.5$, which corresponds to the claim that the XSORT method increases the likelihood of having a girl, so that the proportion of girls is greater than 0.5. If you are responsible for developing the XSORT method and you want to show its effectiveness, which of the following *P*-values would you prefer: 0.999, 0.5, 0.95, 0.05, 0.01, 0.001? Why?

Stating Conclusions About Claims. ***In Exercises 5–8, do the following:***

a. Express the original claim in symbolic form.

b. Identify the null and alternative hypotheses.

5. Claim: 20% of adults smoke. A recent Gallup survey of 1016 randomly selected adults showed that 21% of the respondents smoke.

6. Claim: When parents use the XSORT method of gender selection, the proportion of baby girls is greater than 0.5. The latest actual results show that among 945 babies born to couples using the XSORT method of gender selection, 879 were girls.

7. Claim: The mean pulse rate (in beats per minute) of adult females is 76 or lower. For the random sample of adult females in Data Set 1 from Appendix B, the mean pulse rate is 77.5.