There are two common methods for measuring the concentration of a pollutant in fish tissue. Do the two methods differ on the average? You apply both methods to a random sample of 18 carp and use

Chapter 10 MC

d for yud. (b) the one-sample z test for p. (c) the two-sample t test for p1 - p2.

1. Take pM and pf to be the proportions of all college males and females who worked last summer. We conjectured before seeing the data that men are more likely to work. The hypotheses to be tested are

(d) the two-sample z test for p1 - p2. (e) none of these

H0: pM - pf = 0 versus Ha: pM - pf > 0.

Exercises 7 and 8 refer to the following setting. A study of road rage asked samples of 596 men and 523 women about their behavior while driving. Based on their answers, each person was assigned a road rage score on a scale of 0 to 20.

(c) HO: pM - pf = 0 versus Ha: pM - pf < 0.

The participants were chosen by random digit dialing of telephone numbers.

7. We suspect that men are more prone to road rage than women. To see if this is true test these hypotheses for the mean road rage scores of all male and female drivers:

(a) pC = 1.70.
(b) pC = 0.89.
(c) pC = 0.88.
(d) pC = 0.85.
(e) pC = 0.82.

2. The pooled sample proportion who worked last summer is about

mean road rage scores of all male and female drivers:

(a) pC = 0.85.
(b) pC = 0.88.
(c) pC = 0.89.
(d) pC = 1.70.
(e) pC = 0.82.

3. The 95% confidence interval for the difference pM - pf in the proportions of college men and women who worked last summer is about

(a) 0.06 ± 0.00095.
(b) 0.06 ± 0.0043.
(c) 0.06 ± 0.036.
(d) 0.06 ± 0.043.
(e) 0.001 < p < 0.005.

8. The two-sample t statistic for the road rage study (male mean minus female mean) is t = 3.18. The P-value for testing the hypotheses from the previous exercise satisfies

(a) 0.001 < p < 0.005.
(b) 0.002 < p < 0.01.
(c) 0.001 < p < 0.02.
(d) 0.0005 < p < 0.001.
(e) p > 0.01.

9. A study of road rage asked separate random samples of 596 men and 523 women about their behavior while driving. Based on their answers, each respondent was assigned a road rage score on a scale of 0 to 20. Are the conditions for performing a two-sample t test satisfied?

(a) Maybe; we have independent random samples, but we need to look at the data to check Normality.
(b) No; road rage scores in a range between 0 and 20 can't be Normal.
(c) No; we don't know the population standard deviations.
(d) Yes; the large sample sizes guarantee that the corresponding population distributions will be Normal.
(e) No; the Large sample size ensures that the corresponding population distributions will be Normal.

5. One major reason that the two-sample t procedures are widely used is that they are robust. This means that

(a) t procedures do not require that we know the standard deviations of the populations.
(b) t procedures work even when the Random, Normal, and Independent conditions are violated.
(c) t procedures compare population means, a comparison that answers many practical questions.
(d) confidence levels and P-values from the t procedures are quite accurate even if the population distribution is not exactly Normal.
(e) confidence levels and P-values from the t procedures are quite accurate even if the population distribution is not exactly Normal.
The researcher cannot draw a conclusion about a claim without performing a significance test.

Since the confidence interval includes 0, the researcher cannot conclude that the proportion of iPod owners at the two venues is different.

Both confidence intervals are the same since the confidence interval includes 0, the researcher cannot conclude that the proportion of iPod owners at the two venues is the same.

Janelle's confidence interval is wider since the confidence interval includes more negative than positive values, the researcher can conclude that a higher proportion of people at the rock concert own iPods than at the baseball game.

Both populations are at least 10 times the corresponding sample size since the confidence interval includes 0, there is convincing evidence of a difference in the average amount of time spent on extracurricular activities by students in the suburban and city school districts.

The claim is true since the confidence interval includes 0. Hence there is convincing evidence of a difference in the average amount of time spent on extracurricular activities by students in the suburban and city school districts.

Since the confidence interval includes 0, the researcher cannot conclude that the proportion of iPod owners at the two venues is different.

The claim is false since the confidence interval includes 0, there is not convincing evidence of a difference in the average amount of time spent on extracurricular activities by students in the suburban and city school districts.

Since the confidence interval includes 0, the researcher cannot conclude that the proportion of iPod owners at the two venues is different.

Since the confidence interval includes 0, there is not convincing evidence of a difference in the average amount of time spent on extracurricular activities by students in the suburban and city school districts.

The correct normal distribution for the test is not known since the confidence interval includes 0, there is not convincing evidence of a difference in the average amount of time spent on extracurricular activities by students in the suburban and city school districts.

Since the confidence interval includes 0, the researcher cannot conclude that the proportion of iPod owners at the two venues is different.

The claim is true since the confidence interval includes 0, there is convincing evidence of a difference in the average amount of time spent on extracurricular activities by high school students in a suburban school district with that in a school district of a large city.
16. An SRS of size 100 is taken from Population A with proportion 0.8 of successes. An independent SRS of size 400 is taken from Population B with proportion 0.5 of successes. The sampling distribution for the difference (Population A - Population B) in sample proportions has what mean and standard deviation?

(a) mean = 0.3; standard deviation = 1.3
(b) mean = 0.3; standard deviation = 0.40
(c) mean = 0.047; standard deviation = 0.047
(d) mean = 0.3; standard deviation = 0.0002

17. How much more effective is exercise and drug treatment than drug treatment alone at reducing attacks among men aged 65 and older? To find out, researchers perform a completely randomized experiment involving 1000 healthy males in this age group, half of the subjects are assigned to receive drug treatment only, while the other half are assigned to exercise regularly and to receive drug treatment. The most appropriate inference method for answering the original research question is

(a) one-sample z test for a proportion
(b) two-sample z test for \( p_1 - p_2 \)
(c) two-sample z test for \( \mu_1 - \mu_2 \)
(d) two-sample t test for \( \mu_1 - \mu_2 \)
(e) two-sample test for \( \mu_1 - \mu_2 \)

18. Researchers are interested in evaluating the effect of a natural product on reducing blood pressure. This will be done by comparing the mean reduction in blood pressure of a treatment (natural product) group and a placebo group using a two-sample t test. The researchers would like to be able to detect whether the natural product reduces blood pressure by at least 7 points more, on average, than the placebo. If groups of size 50 are used in the experiment, a two-sample t test using \( \alpha = 0.01 \) will have a power of 80% to detect a 7-point difference in mean blood pressure reduction. If the researchers want to be able to detect a 5-point difference instead, then the power of the test would

(a) be less than 80%
(b) be greater than 80%
(c) be exactly 80%
(d) could be either less than or greater than 80%, depending on whether the natural product is effective
(e) would vary depending on the standard deviation of the data.