Test Bank

# Chapter 8: Estimation With Confidence Intervals

## Multiple Choice

1. The purpose of significane testing is to:

A. determine if a studies results are likely to be due to sampling error.

B. estimate a population parameter value.

C. describes how well a treatment worked.

Ans: A

Learning Objective: Purpose of statistical procedures

2. The purpose of effect sizes is to:

A. determine if a studies results are likely to be due to sampling error.

B. estimate a population parameter value.

C. describes how well a treatment worked.

Ans: C

Learning Objective: Purpose of statistical procedures

3. The purpose of confidence intervals is to:

A. determine if a studies results are likely to be due to sampling error.

B. estimate a population parameter value.

C. describes how well a treatment worked.

Ans: B

Learning Objective: Purpose of statistical procedures

4. The American Psychological Association publication manual recommends that researchers:

A. choose either significance testing, effect sizes, or confidence intervals when reporting results.

B. use significance testing and effect sizes when reporting results.

C. use significance testing and confidence intervals when reporting results.

D. use significance testing, effect sizes, and confidence intervals when reporting results.

Ans: D

Learning Objective: Combining statististical procedures

5. Confidence intervals for mean differences provide researchers with

A. the probability that a given result would occur in the null hypothesis is true.

B. the degree to which a treatment changed a DV in standard deviation units.

C. a range of plausible population values if a study were applied to an entire population.

D. the typical distance between sample means and a population mean.

Ans: C

Learning Objective: Purpose of statistical procedures

6. If you computed a 95% CI for a *mean difference* and found the LB = −2.5 and the UB = 7.5, which of the following conclusions is justified:

A. the distribution is positively skewed

B. the mean difference is sufficiently large to reject the null hypothesis

C. the distribution is negatively skewed

D. the mean difference is NOT sufficiently large to reject the null hypothesis

Ans: D

Learning Objective: Interpretation of mean difference CI

7. If you computed a 95% CI for a *mean difference* and found the LB = 2.5 and the UB = 42.5, which of the following conclusions is justified:A. the distribution is positively skewed

B. the mean difference is sufficiently large to reject the null hypothesis

C. the distribution is negatively skewed

D. the mean difference is NOT sufficiently large to reject the null hypothesis

Ans: B

Learning Objective: Interpretation of mean difference CI

8. Is the following statement true? Values between the LB and UB values of a 95% CI are all equally plausible values for a population parameter.

A. True

B. False

C. it depends, this is true if the CI is for a population mean difference

D. it depends, this is true if the CI is for a population mean

Ans: B

Learning Objective: Interpreting LB and UB values

9. The point estimate of a 95% CI is always:

A. closer to the LB value than the UB value.

B. closer to the UB value than the LB value.

C. the least plausible value for a population parameter.

D. the most plausible value for a population parameter.

Ans: D

Learning Objective: Interpreting CIs

10. The UB and LB values of a 95% CI are always:

A. positive values.

B. negative values.

C. the least plausible values for a population parameter.

D. the most plausible value for a population parameter.

Ans: C

Learning Objective: Interpreting CIs

11. Values falling outside of the LB and UB values of a 95% CI are:

A. impossible values for a paramenter.

B. considered possible paramenter values but not likely parameter values.

C. considered more plausible than those between the LB and UB.

Ans: B

Learning Objective: Interpreting CIs

When computing a 95% CI for a population mean the \_\_\_\_\_\_ is used as the point estimate.

A. UB or LB

B. SEM

C. sample mean

D. *t*-value for the middle 95% of all possible *t*-values

Ans: C

Learning Objective: Computing Cis

13. When computing a 95% CI for a population mean the \_\_\_\_\_\_ is used to compute the margin of error.

A. two-tailed .05 *t*-value based on sample size and the SEM

B. the one-tailed .05 *t*-value based on sample size and the SEM

C. the difference between the LB and UB and the SEM

D. thedifference between the LB and UB.

Ans: A

Learning Objective: Computing CIs

14. Generally speaking, when all other factors are the same, a 95% CI is \_\_\_\_\_\_ than a 99% CI?

A. narrower (meaning a smaller distance between the LB and UB)

B. wider (meaning a larger distance between the LB and UB)

Ans: B

Learning Objective: Logic of CIs

15. All CIs consist of two parts, namely, a \_\_\_\_\_\_ and a(n) \_\_\_\_\_\_.

A. point estimate; margin of error

B. point estimte; effect size

C. margin of error; effect size

D. margin of error; *p* value

Ans: A

Learning Objective: Parts of a CI

16. A psychologist wants to estimate the amount of math anxiety that the population of high school students experience prior to taking their first algebra course. On the first day of class he asks a sample of 36 students to answer the question, “How anxious do you feel when you know you have to do math problems?” They each responded using a 100-point scale with 1 = *not at all anxious* and 100 = *extremely anxious*. The mean reported anxiety score for this sample was 58 with a standard deviation of 30. What is your point estimate in this scenario?

A. 36

B. 100

C. 58

D. 30

Ans: C

Learning Objective: Point estimate

17. A psychologist wants to estimate the amount of math anxiety that the population of high school students experience prior to taking their first algebra course. On the first day of class he asks a sample of 36 students to answer the question, “How anxious do you feel when you know you have to do math problems?” They each responded using a 100-point scale with 1 = *not at all anxious* and 100 = *extremely anxious*. The mean reported anxiety score for this sample was 58 with a standard deviation of 30. What is the *t*-value you need to compute a 95% CI for the population mean anxiety score?

A. 2.0301

B. 2.0281

C. 1.6896

D. 1.6883

Ans: A

Learning Objective: Finding appropriate *t*-value for CI

18. A psychologist wants to estimate the amount of math anxiety that the population of high school students experience prior to taking their first algebra course. On the first day of class he asks a sample of 36 students to answer the question, “How anxious do you feel when you know you have to do math problems?” They each responded using a 100-point scale with 1 = *not at all anxious* and 100 = *extremely anxious*. The mean reported anxiety score for this sample was 58 with a standard deviation of 30. What is the margin of error you need to compute the 95% CI for population mean anxiety score?

A. 10.15

B. 8.448

C. 5.00

D. 2.03

Ans: A

Learning Objective: Computing margin of error

19. A psychologist wants to estimate the amount of math anxiety that the population of high school students experience prior to taking their first algebra course. On the first day of class he asks a sample of 36 students to answer the question, “How anxious do you feel when you know you have to do math problems?” They each responded using a 100-point scale with 1 = *not at all anxious* and 100 = *extremely anxious*. The mean reported anxiety score for this sample was 58 with a standard deviation of 30. Compute the upper and lower boundaries for this 95% confidence interval.

A. LB = 66.45, UB = 49.55

B. LB = 28, UB = 88

C. LB= 47.86, UB = 68.15

D. LB = −10.15, UB = 10.15

E. LB = −5, UB = 5

Ans: C

Learning Objective: Computing 95% CI

20. A psychologist wants to estimate the amount of math anxiety that the population of high school students experience prior to taking their first algebra course. On the first day of class he asks a sample of 36 students to answer the question, “How anxious do you feel when you know you have to do math problems?” They each responded using a 100-point scale with 1 = *not at all anxious* and 100 = *extremely anxious*. The mean reported anxiety score for this sample was 58 with a standard deviation of 30. Which of the following is the best interpretation of this confidence interval?

A. 95% of the sample means for the anxiety scores will be between the lower and upper bound.

B. We are confident that 95% of the anxiety scores will be between the lower and upper bound.

C. We are 95% confident that the population mean anxiety score is between the lower and upper bound.

Ans: C

Learning Objective: Interpreting 95% CI

21. Researchers compute confidence intervals around means to:

A. determine if the distribution of sample means is normally distributed.

B. determine if the observed difference between the means is likely or unlikely to be due to sampling error.

C. quantify the size of the difference between the means.

D. identify a range of plausible values for a population parameter.

E. prove that the null hypothesis is true.

Ans: D

Learning Objective: Purpose of CIs

22. All other things being constant, are 99% confidence intervals wider or narrower than a 95% confidence interval?

A. A 99% confidence interval would be wider than a 95% confidence interval.

B. A 99% confidence interval would be narrower than a 95% confidence interval.

Ans: A

Learning Objective: Logic of CIs

23. *M* = 28; *SD* = 4; *N* = 49; you need a 95% CI to estimate a population mean. What is the point estimate?

A. 95

B. 28

C. 49

D. .57

Ans: B

Learning Objective: Point estimate

24*. M* = 28; *SD* = 4; *N* = 49; you need a 95% CI to estimate a population mean. What is the margin of error?

A. 1.149

B. 2.0106

C. .57

D. .164

Ans: A

Learning Objective: Computing margin of error

25. *M* = 28; *SD* = 4; *N* = 49; you need a 95% CI to estimate a population mean. What is the UB?

A. 29.149

B. 30.0096

C. 28.57

D. 28.164

Ans: A

Learning Objective: Computing UB

26. *M* = 28; *SD* = 4; *N* = 49; you need a 95% CI to estimate a population mean. What is the LB?

A. 26.85

B. 25.9904

C. 27.43

D. 27.836

Ans: A

Learning Objective: Computing LB

27. *M* = 1000; *SD* = 50; *N* = 144; you need a 95% CI to estimate a population mean. What is the point estimate?

A. 1000

B. 144

C. 50

D. 4.167

Ans: A

Learning Objective: Point estimate

28. *M* = 1000; *SD* = 50; *N* = 144; you need a 95% CI to estimate a population mean. What is the margin of error?

A. 4.167

B. 8.167

C. 1.96

D. 4.599

Ans: B

Learning Objective: Computing margin of error

29. *M* = 1000; *SD* = 50; *N* = 144; you need a 95% CI to estimate a population mean. What is the UB?

A. 1004.17

B. 1008.17

C. 156.17

D. 58.17

Ans: A

Learning Objective: Computing UB

30. Choose the correct interpretation of a 95% CI.

A. If we were to take 100 additional samples from the same population, 95 of the confidence intervals would contain the sample mean.

B. We can be 95% confident that the population mean is between the UB and the LB of the CI.

C. both of these

Ans: B

Learning Objective: Interpreting 95% CI

31. A physics instructor wants to determine how much test scores would increase if she assigned online chapter tests after she lectured on each chapter of the exam. The mean score of all her past students on unit test covering chapters 6, 7, and 8 is µ = 79. She took a sample of 100 students and required them to complete online chapter tests for chapters 6, 7, and 8. Then, this sample to the unit test. The mean score was *M* = 82, *SD* = 15. What is the point estimate for how much the test scores would increase if she assigned the online test for all her students?

A. 3

B. 15

C. −3

D. 79

E. 82

Ans: A

Learning Objective: Point estimate for mean difference

32. A physics instructor wants to determine how much test scores would increase if she assigned online chapter tests after she lectured on each chapter of the exam. The mean score of all her past students on unit test covering chapters 6, 7, and 8 is µ = 79. She took a sample of 100 students and required them to complete online chapter tests for chapters 6, 7, and 8. Then, this sample to the unit test. The mean score was *M* = 82, *SD* = 15. What is the 95% CI margin of error for how much the test scores would increase if she assigned the online test for all her students?

A. 1.9842

B. 1.5

C. 2.976

D. 1.65

Ans: C

Learning Objective: Computing margin of error

33. A physics instructor wants to determine how much test scores would increase if she assigned online chapter tests after she lectured on each chapter of the exam. The mean score of all her past students on unit test covering chapters 6, 7, and 8 is µ = 79. She took a sample of 100 students and required them to complete online chapter tests for chapters 6, 7, and 8. Then, this sample to the unit test. The mean score was *M* = 82, *SD* = 15. What is the 95% CI for how much the test scores would increase if she assigned the on-line test for all her students?

A. UB = 5.98; LB = 0.02

B. UB = 4.5; LB = 1.5

C. UB = 4.98; LB = 1.02

D. UB = 1.65; LB = −1.65

Ans: A

Learning Objective: Computing 95% CI

34. A researcher computed 95% CI for a mean difference and found the UB = 5.75 and the LB = 2.25. Based on this information you can conclude that

A. the sample mean and the population mean are NOT significantly different from each other.

B. the sample mean and the population mean are significantly different from each other.

C. you will have to do a significance test to determine if the sample mean and population mean are significantly different from each other.

Ans: B

Learning Objective: Relationship between CIs and significance testing

35. An industrial organizational psychologist wants to determine how much worker job satisfaction would change if workers were given 1.5 hr for lunch break rather than 45 min. Currently, the mean job satisfaction rating is µ = 17.8. A sample of 64 workers were given a 1.5 hr lunch break for 1 month. At the end of the month, this sample’s mean job satisfaction rating is *M* = 18.5, *SD* = 10. What is the margin of error for a 95% CI of the change in job satisfaction rating?

A. 1.9983

B. 1.25

C. 2.50

D. 3.12

Ans: C

Learning Objective: Computing margin of error

36. An industrial organizational psychologist wants to determine how much worker job satisfaction would change if workers were given 1.5 hr for lunch break rather than 45 min. Currently, the mean job satisfaction rating is µ = 17.8. A sample of 64 workers were given a 1.5 hr lunch break for 1 month. At the end of the month, this sample’s mean job satisfaction rating is *M* = 18.5, *SD* = 10. What is the 95% CI for the change in job satisfaction rating?

A. UB = .7; LB = −1.8

B. UB = 3.20; LB = −1.8

C. UB = 21; LB = 16

D. UB 20.3; LB = 15.3

Ans: B

Learning Objective: Computing 95% CI

37. An industrial organizational psychologist wants to determine how much worker job satisfaction would change if workers were given 1.5 hr for lunch break rather than 45 min. Currently, the mean job satisfaction rating is µ = 17.8. A sample of 64 workers were given a 1.5 hr lunch break for 1 month. At the end of the month, this sample’s mean job satisfaction rating is *M* = 18.5, *SD* = 10. Based on the 95% CI for the change in job satisfaction, which of the following is true?

A. We can be 95% confident that changing the lunch break to 1.5 hr would significantly increase job satisfaction.

B. We can be 95% confident that the amount of change in job satisfaction resulting from increasing the lunch break will be statistically significant.

C. We can be 95% confident that the amount of change in job satisfaction resulting from increasing the lunch break will NOT be statistically significant.

Ans: C

Learning Objective: Relationship between CIs and significance testing

## True/False

1. Assuming everything else is held constant, as the sample size increases, the width of the confidence interval decreases.

Ans: T

Learning Objective: Logic of CIs

2. Assuming everything else is held constant, as the amount of sampling error increases, the width of the confidence interval decreases

Ans: F

Learning Objective: Logic of CIs

3. Assuming everything else is held constant, as level of confidence increases, the width of the confidence interval decreases.

Ans: F

Learning Objective: Logic of CIs