

Confidence Intervals Wording Quiz

Name _____

Assume a 95% confidence interval has been calculated for the proportion of orange Reece's Pieces from a bag of 121 candies. The interval is (.32, .49). Forty-nine pieces were orange.

Answer each sample with C(orrect) or I(ncorrect).

- _____ 1. "if this method were used to generate an interval estimate over and over again with different samples, in the long run, 95% of the resulting intervals would capture the true value of the characteristic being estimated."
- _____ 2. There is a 95% chance that the true proportion lies between .32 and .49.
- _____ 3. I have 95% confidence in my methods.
- _____ 4. 95% of the time, the true proportion will lie between .32 and .49.
- _____ 5. 95% of the sample proportions lie in this interval.
- _____ 6. There is a 95% chance that the sample proportion lies in this interval.
- _____ 7. If we computed repeated random sample proportions, about 95% of them would lie in this interval.
- _____ 8. In the long run, 95% of all sample proportions will yield an interval that contains the true population parameter.
- _____ 9. It is probably true that 40.5% of Reece's Pieces are orange.
- _____ 10. 95% of the population will be contained in this interval.
- _____ 11. When I behave in the way in which I am behaving (using statistically correct methods) I expect to be right about 95% of the time and wrong about 5% of the time.
- _____ 12. The interval (.32, .49) will be correct 95% of the time and wrong 5% of the time.
- _____ 13. 95% of samples this size will produce confidence intervals that capture the true proportion of orange Reece's Pieces.

- _____ 14. According to my sample bag, 95% of all Reece's Pieces bags of this size will have between 32% and 49% orange candies.
- _____ 15. According to my sample bag, between 32% and 49% of Reeces' Pieces are orange.
- _____ 16. We are 95% sure that bags of Reece's Pieces will contain between 32% and 49% orange pieces.
- _____ 17. For a given sample size, lower confidence means a larger margin of error.
- _____ 18. For a fixed margin of error, larger samples provide greater confidence.
- _____ 19. For a certain confidence level, you can get a smaller margin of error by selecting a bigger sample.
- _____ 20. For a given confidence level, a sample twice as large will make a margin of error twice as big.

ANSWERS to Confidence Interval Wording #1

1. CORRECT: “if this method were used to generate an interval estimate over and over again with different samples, in the long run, 95% of the resulting intervals would capture the true value of the characteristic being estimated.” (POD p. 443)
2. WRONG: The true population proportion is either IN there or it is NOT in there (100% chance or 0% chance). We just don’t know which.
3. CORRECT: The confidence comes from doing correct methods. We will be right 95% of the time we do these methods correctly.
4. WRONG: There is nothing magical about the numbers .32 and .49. If many additional CI’s were generated from the same sample size, the true proportion will fall within 95% of these intervals.
5. WRONG: Additional SAMPLE proportions do not have to land within this particular CI. We’re pretty sure the TRUE proportion lies in this CI.
6. WRONG: I am 100% sure that my sample proportion lies in this interval!!
7. WRONG: Focus on the true proportion. Our confidence is not about future sample proportions, but on where the true proportion lies.
8. WRONG: This is *almost* a good one! The word “all” could imply different sample sizes or confidence levels, which would make it false. A completely correct answer should include “95% of samples conducted in the SAME manner...”
9. WRONG: This was only OUR sample proportion. Another sample proportion would likely produce a different p-hat. There is nothing magical about our ONE p-hat.
10. WRONG: 95% of the population will be contained in this interval.
11. CORRECT: When I behave in the way in which I am behaving (using statistically correct methods) I expect to be right about 95% of the time and wrong about 5% of the time.
12. WRONG: The interval will be correct 95% of the time and wrong 5% of the time. (it isn’t the interval that is wrong, it is *my* error for choosing to make a decision in this way (Paul Velleman).
13. CORRECT: Same reasoning as #1, 8, 11 (see BVD, p. 374)

14. **WRONG:** The interval isn't about sample proportions, but about the population proportion. (BVD, p. 373)
15. **WRONG:** This statement asserts that the population proportion cannot be outside that interval. We cannot be absolutely sure about that (just pretty sure). (BVD, p. 373)
16. **WRONG:** Again, the focus of a CI should not be on future sample proportions, but rather on the true proportion. (BVD, p. 376, #6c.)
17. **WRONG:** A larger margin of error would give you more confidence. Think about hitting a target. If the target is bigger (larger MOE), then you will have more confidence that you will hit it. Also, check out the formula. Your algebra background should be able to prove this.
18. **CORRECT:** Think back to the target again. If the target stays the same size (same MOE), but you have more chances to throw at the target, then your confidence that you will hit is once increases. You can also do the algebra with the CI formula.
19. **CORRECT:** Do the algebra on the CI formula.
20. **WRONG:** You will need a sample four times as big—see the formula.