# Confidence Interval Interpretation

As a graduate statistics student, I need to carefully consider the correct interpretation of confidence intervals, which are fundamental tools in statistical inference.

The correct answer is \*\*(B) To show the effect sizes that are most compatible with the data under the given model\*\*.

## Explanation:

Confidence intervals provide a range of plausible values for a parameter estimate based on the observed data and specified confidence level. They offer crucial information about:

1. \*\*Precision\*\*: The width of the interval indicates the precision of our estimate

2. \*\*Compatibility\*\*: They show which parameter values are most compatible with our observed data

3. \*\*Effect size estimation\*\*: They focus on the magnitude of effects rather than just binary decisions

Answer (A) is incorrect because confidence intervals aren't merely "another measurement of uncertainty" like p-values. They provide fundamentally different information by emphasizing estimation rather than hypothesis testing.

Answer (C) is problematic because it reduces confidence intervals to binary decision tools (equivalent to significance testing), which modern statistical practice discourages. While we can observe whether a null value falls within an interval, the primary purpose of confidence intervals is estimation, not hypothesis testing.

Answer (D) is incorrect because confidence intervals are valuable tools that actually help address many limitations of p-values by shifting focus from dichotomous thinking to estimation and uncertainty quantification.

The correct interpretation focuses on confidence intervals as ranges of values that are most compatible with our data, given our model assumptions and sampling procedures.