

4. Confidence Interval Concept Checks Continued

Confidence Interval Concepts Review Continued

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⋮ (Caption will be displayed when you start playing the video.)

So here's a new experiment in which there are 150 participants. So basically, think of your 124. Now, it's 150. It turns out that exactly half of them turn their head to the left and half of them turn their head to the right. And now, I'm giving you a bunch of candidates

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Confidence Interval Concept Check 4

0/1 point (graded)
If $[0.34, 0.57]$ is a **realization** of a (non-asymptotic, for some fixed n) 95% confidence interval for an unknown parameter p , then which of the following is true?

The probability that the unknown parameter p is in this interval is

- ☐ ≥ 0.025
- ☐ ≥ 0.05
- ☒ ≥ 0.95 ✖
- ☐ None of the above, because p and $[0.34, 0.57]$ are both deterministic. ✔

Solution:

Given some unknown but fixed parameter $\theta \in \mathbb{R}$ for a parametric model and random variables X_1, \dots, X_n distributed i.i.d. P_θ , recall that the non-asymptotic 95% Confidence Interval of p is an interval $\mathcal{I} = \mathcal{I}(X_1, \dots, X_n)$ such that $\Pr(\mathcal{I} \ni \theta) \geq 0.95$. It is important to note that there is randomness here, given by the randomness of \mathcal{I} .

A realization of a random variable is *deterministic*. The interval $[0.34, 0.57]$ either contains the parameter p , or it doesn't. In other words, the expression $\Pr([0.34, 0.57] \ni p)$ is equal to 1 or 0. Hence, the correct choice is "None of the above, because p and $[0.34, 0.57]$ are both deterministic."