

Confidence Intervals

We've just seen what the mean GCSE scores are for the boys and girls in our survey sample. What are the potential GCSE mean scores for boys and girls in Year 11 in the entire population of England?

Another way to look at mean GCSE scores is to calculate confidence intervals. Our dataset, while quite comprehensive, only includes information about our sample, the people who participated in the YCS. We can calculate the means of variable values in our dataset, but we cannot say that these means are indicative of the true means across the entire population of England. We can, however, calculate a range of values within which the mean across the entire population is likely to fall. This range of values is called a confidence interval. It is possible to calculate a 95% confidence interval and a 99% confidence interval. These intervals are simply a way of giving a range of values that we are fairly (either 95% or 99%) confident includes the true population mean.

A 99% confidence interval will allow you to be more confident that the true value in the population is represented in the interval. However, it gives a wider interval than a 95% confidence interval. For most analyses, it is acceptable to use a 95% confidence interval to extend your results to the general population.

So, let's begin by calculating a 95% confidence interval for the mean GCSE score.

Select **Analyze, Descriptive Statistics**, and then **Explore**.

Move **s1gcseptsnew** to the **Dependent List** box and then click **OK**.

Your output should look like this:

Descriptives			Statistic	Std. Error
ks4 pts score on new basis not capped	Mean		394.3568	1.07192
	95% Confidence Interval for Mean	Lower Bound	392.2557	
		Upper Bound	396.4579	
	5% Trimmed Mean		397.8043	
	Median		406.0000	
	Variance		15821.926	
	Std. Deviation		125.78524	
	Minimum		8.00	
	Maximum		857.00	
	Range		849.00	
	Interquartile Range		159.25	
	Skewness		-.427	.021
	Kurtosis		.186	.042

You can see in the table above that the Lower Bound of our 95% Confidence Interval is 392.2557 and the Upper Bound is 396.4579. We can interpret these results by saying that we are 95% confident the mean GCSE score for all young people in Year 11 in England will fall between 392.2557 and 396.4579. This is a simple interpretation of the interval – there are more nuances to the actual interpretation – but this will be adequate for now!

Now we can calculate a 99% confidence interval for mean GCSE score.

Select **Analyze, Descriptive Statistics**, and then **Explore**.

Our variable **s1gcseptsnew** should still be in the **Dependent List** box. Click on the **Statistics** tab on the upper right. In the dialogue box that opens, make sure **Descriptives** is marked and change the **Confidence Interval for Mean** from 95% to **99%**. Click **OK**.

Your output should look like this:

Descriptives			Statistic	Std. Error
ks4 pts score on new basis not capped	Mean		394.3568	1.07192
	99% Confidence Interval for Mean	Lower Bound	391.5953	
		Upper Bound	397.1183	
	5% Trimmed Mean		397.8043	
	Median		406.0000	
	Variance		15821.926	
	Std. Deviation		125.78524	
	Minimum		8.00	
	Maximum		857.00	
	Range		849.00	
	Interquartile Range		159.25	
	Skewness		-.427	.021
	Kurtosis		.186	.042

What is the 99% confidence interval for mean GCSE score?

How would you interpret this confidence interval?

Summary

You've just calculated 95% and 99% confidence intervals using the data in our continuous variable, s1gcseptsnew. Confidence intervals allow us to generalize our findings from the samples from which our data was taken to the population from which our survey sample was drawn. This ability to generalize one's findings is often very helpful in social science research.