SPSS Chapter 3 Example 2 - Sampling Distribution for N=25 and n=10

The notes describe a very non-normal population. The central limit theorem tells us that the sampling distribution of the mean from this non-normal population will be normal as the sample size increases. You can see this by performing the following simulation on SPSS.

Follow these steps to produce a sampling distribution of 25 samples (N=25) of size ten (n=10) from our population of $\mu = 2.0$:

- 1. Click File, click New, and click Syntax. The SPSS Syntax Editor window will appear (see Introduction).
- 2. Enter the following text, or *syntax*, as you see it below.

🐕 P64syn~1 - SPSS Syntax Editor 📃 🗖 🗙				
<u>File E</u> dit <u>V</u> iew <u>S</u> tatistics <u>G</u> raphs <u>U</u> tilities <u>R</u> un <u>W</u> indow <u>H</u> elp				
2				
INPUT PROGRAM.				
+ LOOP # = 1 TO 25.				
+ DO REPEAT RESPONSE = R1 TO R10.				
+ COMPUTE RESPONSE = UNIFORM(4).				
+ END REPEAT.				
+ COMPUTE AVG = MEAN(R1 TO R10).				
+ END CASE.				
I+ END LOOP.				
DESCRIPTIVES VARIARI ES=AVG				
/STATISTICS=MEAN STDDEV				
NPPLOT AVG				
<u> </u>				
📍 SPSS Processor is ready				

3. To run the program that you have entered, click **Run** and then click **All**. (You may also run the program after using the mouse to highlight all the syntax, and then clicking the ▶ button.)

The SPSS output for this example of a Sampling Distribution is the following:

Histogram



AVG

Note that the mean of our sampling distribution is 2.02, yet our population mean is 2.0.

Descriptive Statistics

			Std.
	N	Mean	Deviation
AVG	25	2.02	.36
Valid N (listwise)	25		

In order to assess the normality of our sampling distribution we produce a normal probability plot of the data.



Normal Q-Q Plot of AVG

The plot indicates that we have a reasonable normal distribution for this sample size.

Try this: Change N from 25 to 100 (second line in the syntax file) and see what happens. What is the mean of the sampling distribution?

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