

COMPARING THE DURABILITY OF TIRES

5. Describing Data

In this section we will use numerical summaries to compare the durability of the two brands of tires. In particular, we will describe the data by obtaining the basic measures of center, spread, and shape for the distribution of differences.

5.1 Paired Differences Descriptive Statistics

5.2 Paired Samples Descriptive Statistics

5.1 The *Explore* command in SPSS produces the following summary statistics for the distribution of differences. The outputs are also displayed in the *SPSS Instructions* module. For your convenience, we summarized the output in the form of the following table:

	STATISTICS	DIFFERENCES D=A-B
MEASURES OF CENTER	MEAN	0.2765
	MEDIAN	0.3650
	5% TRIMMED MEAN	0.2833
	95% CI FOR MEAN	(0.1486, 0.4044)
MEASURES OF SPREAD	STANDARD DEV.	0.2734
	STANDARD ERROR	0.0611
	VARIANCE	0.0747
	IQR	0.4400
	MINIMUM	-0.2300
	MAXIMUM	0.6600
	RANGE	0.8900
MEASURES OF SHAPE	SKEWNESS	-0.5952
	ST. ERROR SKEWNESS	0.5121
	KURTOSIS	-0.9362
	ST. ERROR KURTOSIS	0.9924
COUNT		20

The above numerical results confirm our conclusions reached in the previous section about the graphical displays for the data. All displayed measures of center indicate that the typical difference in the tread depth between the brand A and brand B tires is positive indicating that the tread depth of brand A tires tends to exceed the tread depth of brand B tires. The average difference is estimated to be between 0.1486 and 0.4044 with 95% confidence. The magnitudes of the standard deviation and the interquartile range indicate that the spread of the data about the center is large compared to the magnitude of the differences. The negative sign of the skewness coefficient confirms our observation that the distribution is skewed to the left.

5.2

The *Explore* command in SPSS produces also the summary statistics for both distributions. The outputs are displayed in the *SPSS Instructions* module. We summarized the outputs in the form of the following table:

	STATISTICS	BRAND	
		A	B
MEASURES OF CENTER	MEAN	6.4370	6.1605
	MEDIAN	6.4950	6.0300
	5% TRIMMED MEAN	6.3867	6.1033
	95% CI FOR MEAN	(6.1461, 6.7279)	(5.8722, 6.4488)
MEASURES OF SPREAD	STANDARD DEV.	0.6215	0.6159
	STANDARD ERROR	0.1390	0.1377
	VARIANCE	0.3863	0.3794
	IQR	0.6275	0.5250
	MINIMUM	5.3200	5.3000
	MAXIMUM	8.4600	8.0500
	RANGE	3.1400	2.7500
MEASURES OF SHAPE	SKEWNESS	1.5528	1.4671
	ST. ERROR SKEWNESS	0.5121	0.5121
	KURTOSIS	5.5777	3.7314
	ST. ERROR KURTOSIS	0.9924	0.9924
COUNT		20	20

The above numerical results confirm our conclusions reached in the previous section about the graphical displays for the data. Note that the variation for each brand is much larger than the variation for the differences.