

Factor Analysis in SPSS Using a Correlation Matrix as Input

In SPSS, factor (or component) analysis can be estimated by inputting a correlation (or covariance) matrix rather than the raw data as input. This can be useful when rerunning an analysis from data supplied in an article or a report.

To read in a correlation matrix for input to SPSS, use syntax such as that shown below.

```
MATRIX DATA VARIABLES=x1 x2 x3 x4 x5 x6/CONTENTS=CORR N.  
BEGIN DATA.  
1.00  
0.70 1.00  
0.65 0.75 1.00  
0.20 0.05 0.25 1.00  
0.15 0.10 0.15 0.65 1.00  
0.10 0.20 0.20 0.75 0.60 1.00  
100 100 100 100 100 100  
END DATA.
```

In the syntax above, the command **MATRIX DATA** indicates that data in the form of a matrix (rather than raw data) is to be read in.

The subcommand **VARIABLES =** specified the names of the variables. There must be as many names as there are variables in the matrix (here, there are 6).

The subcommand **CONTENTS = CORR N** specifies that a correlation matrix and a vector of sample sizes will be read in. When reading in matrix data, sample sizes must be supplied as these cannot be obtained from the correlation matrix,

The **BEGIN DATA** command indicates that the data will begin on the next line.

After the **BEGIN DATA** command, enter the lower diagonal of the correlation matrix, including the 1's on the diagonal.

On the line after the correlation matrix, enter the sample sizes. If using listwise deletion, these should be the sample size after listwise deletion, and the resulting sample size will be the same for each variable. Even though the sample size value is the same for each variable, it must be entered for each. Here, I have entered the value "100" for each variable.

The **END DATA** command indicates the end of matrix data entry.

Running this set of commands will cause the data window below to appear in SPSS:

ROWTYPE	VARNAME	x1	x2	x3	x4	x5	x6
N		100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
CORR	x1	1.0000	.7000	.6500	.2000	.1500	.1000
CORR	x2	.7000	1.0000	.7500	.0500	.1000	.2000
CORR	x3	.6500	.7500	1.0000	.2500	.1500	.2000
CORR	x4	.2000	.0500	.2500	1.0000	.6500	.7500
CORR	x5	.1500	.1000	.1500	.6500	1.0000	.6000
CORR	x6	.1000	.2000	.2000	.7500	.6000	1.0000

These data can now be used in SPSS analyses such as **FACTOR** that accept matrix data. The usual commands are used with one exception.

In the **FACTOR** command, include the syntax **MATRIX = IN(CORR = *)**. This indicates that matrix data should be used. The specification **IN(CORR = *)** indicates that the input matrix is a correlation matrix and that the current active file (indicated by an asterisk) should be used.

```
FACTOR matrix=in(corr=*)
/ANALYSIS x1 x2 x3 x4 x5 x6
/PRINT INITIAL CORRELATION REPR EXTRACTION ROTATION
/CRITERIA FACTORS(1) ITERATE(25)
/EXTRACTION PAF
/ROTATION OBLIMIN
/METHOD=CORRELATION .
```