components analysis. However, the factors obtained will not actually be the principal components (although the loadings for the k^{th} factor will be proportional to the coe□cients of the k^{th} principal component).

- **Principal axis factoring**
  This is a method which tries to find the lowest number of factors which can account for the variability in the original variables that is associated with these factors (this

4 Carrying out factor analysis in SPSS

– **Analyze**
– **Data Reduction**
– **Factor**
– Select the variables you want the factor analysis to be based on and move them into the **Variable(s)** box.
– In the **Descriptives** window, you should select **KMO and Bartlett's test of sphericity**. KMO is a statistic which tells whether you have sufficient items for each factor. It should be over 0.7. Bartlett's test is used to check that the original variables are sufficiently correlated. This test should come out significant ($p < 0.05$) — if not, factor analysis will not be appropriate. Click on **Continue**.
– In the **Extraction** window, you can select the extraction method you want to use (e.g. principal components, etc.). Under **Analyze** ensure that **Correlation Matrix** is selected (this is the default). The default is also to extract eigenvalues over 1 but if you want to extract a specific number of factors you can specify this. Click on **Continue**.
– In the **Rotation** window you can select your rotation method (as mentioned above, **Varimax** is the most common). You can also ask SPSS to display the rotated solution. Once you have selected this click on **Continue**.
– In the **Scores** window you can specify whether you want SPSS to save factor scores for each observation (this will save them as new variables in the data set). Under **Method** choose **Regression**. You can also ask SPSS to display the factor score coefficients (the a_is). Click on **Continue**.
– **OK**

5 References

- Manly, B.F.J. (2005), **Multivariate Statistical Methods: A primer**, Third edition, Chapman and Hall.
- Rencher, A.C. (2002), **Methods of Multivariate Analysis**, Second edition, Wiley.