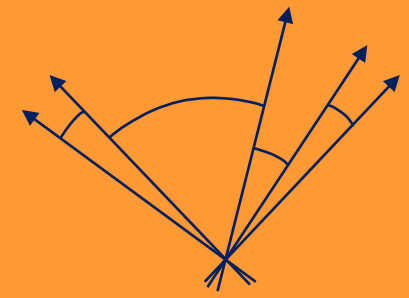
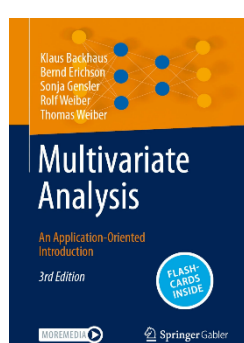


# FACTOR ANALYSIS



MAIN RESEARCH QUESTION	CAN VARIOUS VARIABLES BE COMBINED TO (LATENT) FACTORS?
EXAMPLE	REDUCE THE DIFFERENT TECHNICAL ATTRIBUTES OF VEHICLES TO A FEW DIMENSIONS, SUCH AS PERFORMANCE OR SAFETY
TYPE OF ANALYSIS	STRUCTURE-DISCOVERING METHOD
MEASUREMENT LEVEL	METRIC
RECOMMENDATIONS	<ul style="list-style-type: none"><li>▪ THE NUMBER OF OBSERVATIONS SHOULD BE AT LEAST THREE TIMES THE NUMBER OF VARIABLES, AND AT LEAST 50 OBSERVATIONS.</li><li>▪ ASSESS THE SUITABILITY OF THE DATA WITH THE HELP OF DIFFERENT MEASURES. THE BARTLETT TEST SHOULD BE SIGNIFICANT.</li><li>▪ DECIDE WHETHER TO PERFORM A PRINCIPAL COMPONENT ANALYSIS OR A PRINCIPAL AXIS FACTORING. NEXT TO PRINCIPAL AXIS FACTORING, THE MAXIMUM LIKELIHOOD METHOD IS FREQUENTLY USED TO ESTIMATE THE COMMUNALITIES AND FACTOR LOADINGS.</li><li>▪ USE THE KAISER CRITERION AND SCREE TEST TO DECIDE ON THE NUMBER OF FACTORS.</li><li>▪ THE VARIMAX ROTATION IS FREQUENTLY USED TO EASE THE INTERPRETATION OF THE FACTOR SOLUTION SINCE IT KEEPS THE ASSUMPTION OF ORTHOGONAL (UNCORRELATED) FACTORS.</li><li>▪ VARIABLES THAT BELONG TO A FACTOR SHOULD HAVE A FACTOR LOADING ABOVE 0.5.</li><li>▪ SUMMATED SCALES ARE FREQUENTLY USED IN ACADEMIC LITERATURE SINCE THE ORIGINAL SCALE IS KEPT.</li></ul>
KEYWORDS	ANTI-IMAGE COVARIANCE MATRIX, BARTLETT TEST, COMMUNALITY, CONFIRMATORY FACTOR ANALYSIS, CROSS-LOADINGS, EIGENVALUE (CRITERION), (ROTATED) FACTOR LOADING MATRIX, FACTOR LOADINGS, OBLIQUE FACTOR ROTATION, RECTANGULAR (VARIMAX) ROTATION, FACTOR SCORE COEFFICIENTS, SUMMATED SCALES, SURROGATES, FACTOR SCORES, GLS METHOD, IMAGE FACTORING, KAISER CRITERION, KAISER-MEYER-OLKIN (KMO) CRITERION, MEASURE OF SAMPLING ADEQUACY (MSA), PRINCIPAL AXIS FACTORING (PAF), PRINCIPAL COMPONENT ANALYSIS (PCA), SCREE PLOT/TEST, UNIQUE VARIANCE



BACKHAUS, KLAUS; ERICHSON, BERND; GENSLER, SONJA; WEIBER, ROLF; WEIBER, THOMAS (2025)  
MULTIVARIATE ANALYSIS – AN APPLICATION-ORIENTED INTRODUCTION, SPRINGER: BERLIN

[WWW.MULTIVARIATE-METHODS.INFO](http://WWW.MULTIVARIATE-METHODS.INFO)