

Contents

1	Questions that Can Be Answered with CFA	1
	References	8
2	Elements of CFA	11
2.1	Lienert's Version of CFA	11
2.2	Log-Linear Models for the Estimation of Expected Cell Frequencies in CFA	14
2.3	CFA Base Models and Their Design Matrices	16
2.4	Base Models of CFA	19
2.4.1	A Classification of Base Models for CFA	22
2.4.2	Global CFA Base Models	22
2.4.3	Regional Models of CFA	26
2.4.4	Multi-Step CFA Models	28
2.5	CFA of Transformed Data	29
2.6	CFA Under Consideration of Special Variables	30
2.7	Testing Hypotheses in CFA	32
2.7.1	CFA Significance Tests	32
2.7.2	The Exact Binomial Test	33
2.7.3	Approximative Tests	34
2.7.4	Tests for Groups of Configurations	42
2.7.5	Protecting the Significance Level α	44
2.7.6	Methods for the Protection of α	46
2.8	The Four Steps of CFA	51
	References	55
3	Models of CFA	61
3.1	Global CFA Models	61
3.1.1	Zero Order CFA	62
3.1.2	First Order CFA	64
3.1.3	Second and Higher Order CFA	67
3.1.4	Global CFA After Removal of a Group of Effects	73

6	Special Variables in CFA	221
6.1	Covariates in CFA	221
6.2	CFA with Ordinal Variables	230
6.2.1	Iterative Proportional Fitting	231
6.2.2	The Linear-by-Linear Association Model	233
6.3	Moderator Variables in CFA	236
6.4	Mediator CFA	244
6.4.1	Significance Testing of the Indirect Effect	245
6.4.2	Evaluating Mediator Hypotheses	246
6.4.3	Causal Mediator Analysis	247
6.4.4	Mediator Models for Categorical Variables	249
6.4.5	Configural Mediation Analysis	252
6.4.5.1	Pattern-Specific Mediation Models	252
6.4.5.2	von Eye et al.'s (2009) Method of Mediation Analysis	253
6.4.5.3	Smyth and MacKinnon's (2020) Modifications	256
6.4.5.4	Wiedermann and von Eye's (2020) Method	257
	References	266
7	The Treasure Chest of CFA	269
7.1	Alternative Approaches to CFA	269
7.1.1	Victor's Alternative Exploratory CFA	269
7.1.2	von Eye and Mair's Alternative Sequential CFA	273
7.2	Functional CFA	280
7.2.1	Functional CFA I: The Ascending, Inclusive Strategy	280
7.2.2	Functional CFA II: The Descending Excluding Strategy	286
7.3	CFA and Tree Structures	289
7.4	Rater Agreement	296
7.5	CFA of Large Sparse Tables	301
7.6	CFA as Test of Multivariate Normality	303
7.7	Latent Class Analysis and CFA	308
7.8	CFA and Causality	315
7.8.1	Forms of Causal Relations	316
7.8.2	CFA and Granger Causality	322
7.9	CFA of Intensive Longitudinal Data	327
7.10	Bayes CFA	330
7.10.1	Bayes Definition of Types and Antitypes	331
7.10.2	Patterns of Types and Antitypes	332
7.11	Limits of CFA: Issues and Countermeasures	335
	References	338
8	Software for CFA	345
8.1	CFA Fortran Program	345
8.2	R Packages and Modules	352

3.2	Regional Models of CFA	75
3.2.1	Finding Groups of Variables for CFA	76
3.2.2	Prediction CFA	80
3.2.3	Bi-Prediction CFA	86
3.2.4	Comparing Groups of Data Carriers	89
3.2.4.1	Two-Group CFA	90
3.2.4.2	Descriptive Measures for Two-Group CFA	95
3.2.4.3	Three Ways to Deviate from Independence	97
3.2.4.4	CFA for the Comparison of Multiple Groups	101
	References	107
4	Models of Longitudinal CFA	111
4.1	CFA of Differences	112
4.1.1	Difference Scores	112
4.1.2	CFA of Differences	115
4.1.3	Expected Frequencies in the Analysis of Difference Variables	119
4.2	Level, Variability, and Shape of Series of Measures	121
4.2.1	CFA of Change in Level of Series of Measures	122
4.2.2	CFA of Variability of Series of Measures	125
4.2.3	CFA of Polynomial Parameters	130
4.2.4	Series of Scores that Differ in Length	138
4.3	CFA in Quasi-Experimental and in Experimental Designs	143
4.3.1	CFA and Designs with no Control Group	143
4.3.2	CFA of Data from Control Group Designs	149
4.4	Confirmatory CFA of Longitudinal Data	150
4.5	CFA of Longitudinal Correlations or Distances	155
4.6	Prediction in Longitudinal Data	158
4.6.1	Predicting the End Point of a Series of Scores	158
4.6.2	Predicting a Trajectory with CFA	161
4.6.3	Predicting One Trajectory from another	164
4.7	Auto-Association CFA	166
4.8	Predicting the Shape of a Curve: The Case of Multiple Predictors	173
4.9	CFA of Lags: Intra-Individual Series of Scores	176
4.10	Functions as CFA Base Models	182
	References	188
5	Designs for CFA	191
5.1	Fractional Factorial Designs for CFA	192
5.1.1	Fractional Factorial Designs: An Introduction	194
5.1.2	Creating Fractional Factorial Designs	198
5.1.3	Fractional Factorial Designs in CFA	202
5.2	Structural Zeros in CFA	206
5.2.1	Incomplete Tables and Separability	210
5.2.2	Design-Specific Structural Zeros	215
	References	219

8.2.1	Global CFA Base Models	352
8.2.2	Prediction CFA	359
8.2.3	Two-Group CFA	362
8.2.4	Bayes CFA	363
	References	366
	References	367
	Index	383