

CFA-Software – an overview

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Summary

The reader will find in this paper a limited overview of existing Configural Frequency Analysis (CFA) software. Six CFA-programs are compared with reference to set of criteria, including, but not limited to, operating system needed, programming language, options of application, special features, references.

Key words: CFA software, program characteristics, Lienert-Archive

1. Introduction

The present article provides an overview of a selection of CFA software. Included are programs that continue to be actively developed. Working exploratively using one of the known CFA base models, one can use any program package that contains the *loglinear model* or the *classical CFA base model*. Typically, however, the user will find a *custom tailored* CFA program more convenient. For example, if a researcher aims at detecting types or anti-types in two or more samples, programs written specifically for CFA, for example the programs CFA by von Eye (2001), KFA by Krauth and Hebben (1993), or DASY/SICFA by Lautsch and von Weber (1995) are suitable.

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In this article, we review six programs. For this review, we use the following criteria which should enable the user to identify a suitable program:

- Type of program (separate modules or program package)
- Operating system needed (e.g., DOS, UNIX, Windows)
- Programming language (e.g., Turbo Pascal, FORTRAN 90)
- Manual availability (e.g., as a file or online-help), latest release (year)
- Data input and data handling
- CFA-models available (e.g., classic base model, hierarchical CFA)
- Number of tests for types and antitypes
- Concepts of expectancy estimation (e.g., Victor-expectancies)
- Special features (e.g., possible orders of CFA, max. number of variables)
- References (concerning, e.g., program control)
- Reference address (mail and e-mail addresses).

It is important for a good selection of a program that users can judge the match between their scientific question and the mathematical-statistical concepts of the CFA. When this match has been established, researchers search for a software program. The following references are recommended for more information concerning the statistical foundations and methods of Configural Frequency Analysis and its application:

- von Eye, A. (2002). *Configural Frequency Analysis – Methods, Models and Applications*. Mahwah: Lawrence Erlbaum.
- Lautsch, E. & von Weber, St. (1995). *Methoden und Anwendungen der Konfigurationsfrequenzanalyse (KFA)*. Weinheim: Psychologie Verlags Union.
- Krauth, J. & Lienert, G.A. (1995). *KFA - Die Konfigurationsfrequenzanalyse und ihre Anwendung in Psychologie und Medizin* (reprint), Weinheim: Psychologie Verlags Union.
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2. CFA-Software

The program overview is given in a table that provides a quick orientation in the jungle of CFA-programs. Novices are recommended to read one of the above introductory texts. More literature can be found in these texts and in the database of the Lienert archive of the University of Kassel, Germany (<http://www.lienert-archiv.de>). This database is updated consistently, and it contains both technical and application-oriented papers. At the homepage of the Lienert archive, one can find not only information concerning CFA-programs, but also downloadable programs. In addition, there exists more software, based on a variety of operating systems and programs. For a selection of these programs see, for instance, von Eye (2002).

Table 1: Characteristics of CFA programs

	PROGRAM					
	KFA	KFA	CFA	DASY	BIAS 7.06	SPSS 11
[0]	[1]	[2]	[3]	[4]	[5]	[6]
Authors	Dunkl	Krauth & Hebben	von Eye	von Weber & Lautsch	Ackermann, Stolz, & Zelmer	SPSS Inc.
Type of program	independent modules	stand alone	stand alone	stand alone with module SICFA	software package with module KFA	software package with module LOGLINEAR
Operating system	DOS/ WINDOWS	DOS/ WINDOWS	DOS/ WINDOWS	DOS/ WINDOWS	DOS/ WINDOWS	UNIX, WINDOWS
Programming language	Turbo Pascal	Quick Basic	Fortran 90	Turbo Pascal	PowerBasic, C, Assembler	Fortran
Manual	none	readme.1st	yes	da_hf_*.doc online help	BIAS online help	yes, and online help
latest release	1998	1993	2001	2002	2002	2002
Data handling	raw data, interactive table input	table input interactively or from file	raw data from file, tables from file or interactively	raw data, tables from file or interactively	interactive table input	raw data as SPSS input
number of significance tests	8	5	8 (+ 9 for two- sample CFA)	6	3	1
CFA concepts	classical, Victor	classical	classical	classical, Victor	classical	classical

CFA base models						
[0]	[1]	[2]	[3]	[4]	[5]	[6]
first order (classical)	x	x	x	x	x	x
hierarchical		x		x (only in previous release)		
2-sample	x	x	x	x (only in previous release)	x	(x)
multiple sample CFA		x	x	x (only in previous release)	x	(x)
Interaction structure analysis (ISA)		x	x			(x)
Prediction CFA	(x)	x	x	x	x	(x)
zero order CFA			x		x	(x)
second order CFA			x			(x)
higher order CFA			x			(x)

Special features						
[0]	[1]	[2]	[3]	[4]	[5]	[6]
	modules exist for association structure analysis (ASA), overall independence, incomplete tables, multivariate symmetry, and there is a SAS macro for first order CFA	max. number of variables = 14, ISA (ascending, descending), exact tests	max. 10 variables, covariates can be taken into account, structural zeros, descriptive statistics, nine tests for 2-sample CFA, program can categorize raw data	α - and β -controlled type search, max. 5 variables, data split (hybrid CFA), bootstrap simulation, raw data management, χ^2 -controlled variable selection (max 20 variables)	max. 9 variables, discriminant CFA	

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