



Interuniversity Graduate School of Psychometrics en Sociometrics  
Faculty of Social and Behavioral Sciences, Leiden University  
P.O. Box 9555, 2300 RB Leiden, the Netherlands  
Phone: + 31 (0)71 527 3829, Fax + 31 (0)71 527 3794  
E-mail: [iops@iops.nl](mailto:iops@iops.nl)  
Web: [www.iops.nl](http://www.iops.nl)

### **Seminar *Multi-way analysis in practice***

**Dates: 19-21 November 2007**

Final registration date: 5 November 2007

**Instructor(s):** Professor Pieter M. Kroonenberg (Leiden University)  
Dr Marieke Timmerman (University of Groningen)  
Dr Alwin Stegeman (University of Groningen)

**Location and how to get there:** Leiden University, room numbers will follow

#### **Short description of the seminar:**

This course is designed to introduce PhD students and post-doc to the, primarily exploratory, analysis of multi-way and multi-set data. Given that multi is in most cases three, the presentation will be primarily in terms of three-way data and models. The seminar is designed with the view of applying the methods, rather than as a mathematical exposition of the theory of multi-way and multi-set methods. During the course, there will be a number of practice sessions with multi-way software to gain a feeling of how analyses can be conducted and there is ample opportunity to analyse one's own data, if so desired.

In the seminar, the major models in the area will be discussed including those topics which are required to perform insightful analyses. Moreover, a variety of examples will be presented to give an idea of what is possible with multi-way data. Such topics as the analysis of semantic differential data, fMRI data, multi-set data will be discussed.

#### **Course format:**

**Language:** English

#### **Prerequisites:**

A prerequisite is a solid grasp of principal component analysis and a basic familiarity with linear algebra and matrices. A detailed knowledge of mathematical statistics is not necessary.

#### **Literature (suggested reading)**

Harshman, R. A. & Lundy, M. E. (1994). PARAFAC: Parallel factor analysis. *Computational Statistics and Data Analysis*, 18, 39-72.

Kroonenberg, P. M. (1994). The TUCKALS line: A suite of programs for three-way data analysis. *Computational Statistics and Data Analysis*, 18, 73-96.

Kiers, H. A. L., & Van Mechelen, I. (2001). Three-way component analysis: Principles and illustrative application. *Psychological Methods*, 6, 84-110.

**Minimum/maximum number of participants:** 10/25

**Certificate:** yes

**Number of European Credit Points:** 2

## Program Multi-way analysis in practice

	Day 1	Day 2	Day 3
<b>9:15 - 10:15</b>		Tucker Models	Rotation of Components and Core Array.
<b>10:30 - 11:15</b>	Introduction Three-Way Data	Tucker Example: Eve White, Eve Black and Jane	Parafac Example: fMRI data (Alwin Stegeman)
<b>11:45 - 13:00</b>	Three-Way Models	Preprocessing	Inference in three-way model using bootstrap techniques (Marieke Timmerman)
<b>13.00 - 14.00</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>
<b>14:00 - 15:00</b>	Parafac Model	Interpretation and Plotting	Multi-set and other three-way like models (Marieke Timmerman)
<b>15:15 - 16:00</b>	Parafac Example: Asthma Data	<b>Practice Session II:</b> 3WayPack Tucker models	Rounding-up
<b>16:15 - 17:30</b>	<b>Practice Session I:</b> 3WayPack Parafac model (Trilin)	<b>Practice Session III:</b> a. MatLab-demo b. Opportunity to analyse your own data or continuation of Practice Sessions I or II	

### Fees

IOPS PhD students	Free
PhD students appointed as AiO at a university	€ 300 and € 25 registration fees; additional costs for course materials
IOPS staff members, and IOPS alumni	€ 300 and € 25 registration fees; additional costs for course materials
Other participants	€ 900 and € 25 registration fees; additional costs for course materials

### Information and registration

Lidy van Everdingen (IOPS course administration)

Faculty of Social and Behavioral Sciences, P.O. Box 9555, 2300 RB Leiden - The Netherlands

E-mail: [iops@iops.nl](mailto:iops@iops.nl)

Voice: +31 (0) 71 527 3829

### Cancellation

No refund is made for cancellations after the final registration date of the seminar (5 November 2007).