An introduction to an Introduction

PSY544 – Introduction to Factor Analysis

Week 1

First off.....English!

- This course is taught in ***English*** (yay!) – for many reasons…
- All lectures, all homeworks, all e-mails, the exam...
- Even though I do speak Czech, please no Czech in class or in your coursework
- Am I too fast? Am I too slow? Do I mumble? Do I sound funny? Tell me.

Course logistics

- Lecture times are Mon (P22) + Wed (U34), 18:00 – 18:50
- 4 credits

Course logistics

- No official requirements, but…
- At least an elementary stats course (correlation, linear regression, partial correlation, multiple regression)
- Some knowledge of R is great (we'll need it later on, you have time)
- If you're not so sure, please catch up/refresh; I will assume you did

Course logistics

- Math!
- We will learn a bit of matrix algebra, it’s EASY (might be a review for some of you)

- But yes, this course will be more math-y than most PSYCH courses. Don’t worry, even if you think you suck at math.

Course logistics

- Usually, courses focus on ***how*** to use factor analysis, ***how*** to interpret it, ***how*** to report it – all the nitty-gritty of ***application***

- This course will, instead, put much more stress on ***how*** does factor analysis ***work*** and what is the (statistical) ***theory*** behind the model.

- While this course will not offer you a cookbook for doing factor analysis, it will empower you to understand the inner workings of factor analysis and will train you to be an informed factor analyst.

Course logistics

In other words, I won’t spend a lot of time teaching you how to drive…

…but I will spend a lot of time teaching you how does the car work.

Course logistics

Requirements:

- Participation (will be somewhat monitored, no strict rules…for the moment ☺)
- Homework (three short homework assignments, 20% of grade)
- Exam (take-home, 40% of grade)

Grading criteria in the syllabus

Course logistics

- Academic misconduct – **no** copying, **no** teamwork on assignments, **no** plagiarism. Pretty please.

Course materials:

- Notes (presentations) will be given ahead of time, bring them if you wish
- No other material is necessary, but feel free

- Please talk to me if you need anything or feel lost. Communication is key.

Course logistics

A slightly “different” course. Relatively speaking:

- More frequent
- More frontal
- Less time spent on assignments
- NO group projects (does anyone even like those?)
- Narrower scope, but much more in-depth

Any questions?

Course content

First:

- Factor analysis at-a-glance
- Definition and review of key terms, ideas and concepts
- A bit of history (a very tiny bit)
- Scalars, vectors and matrices
- Basic vector and matrix operations and functions

(Assignment 1)

+ Review your Greek / Γρεεκ ☺

Course content

Second:

- The model (The *Unrestricted [Exploratory] Common Factor Model)*
- The methodology (Fitting the model, Estimation, Rotation, Fit)
- The software! (CEFA)

(Assignment 2)

Course content

Third:

- Still the same old model (The *Restricted [Confirmatory] Common Factor Model)*
- The methodology (Constraints, Identification, Fit)
- The software! (lavaan)

(Assignment 3)

Course content

Further (if time permits):

- Special topics and „extras“

Course objectives

- At the end of the semester, you will:
    - Have a solid understanding of the theory behind EFA and CFA
    - Become an informed data analyst when performing FA
    - Be able to use major software for EFA and CFA
    - Be able to interpret and communicate EFA and CFA results
    - Be able to evaluate other people's work