INTERMEDIATE STATISTICS USING SPSS SPRING, 2024

DEPARTMENT OF PSYCHOLOGY AND BEHAVIOURAL SCIENCES AARHUS UNIVERSITY



Dates:	1-2 February, 2024 7-8 March, 2024 18-19 April, 2024 6-7 May, 2024 13-14 June, 2024		
Time:	10.00-15.30: 01.02 / 07.03 / 18.04 / 06.05 / 13.06 09.00-15.30: 02.02 / 08.03 / 19.04 / 07.05 / 14.06		
Venue:	Aarhus University (see details on page 3)		
Lectures:	Ali Amidi (AA; <u>ali@psy.au.dk</u>)		
	Bobby Zachariae (BZ; <u>bzach@psy.au.dk</u>)		
	Mia Skytte O'Toole (MSO; <u>mia@psy.au.dk</u>)		

Sergio Pirla (SP; sergio.pirla@psy.au.dk)

Course description

Objective: The aim of this course is to provide participants with a broad, intermediate-level competence in carrying out common quantitative psychological analyses using IBM SPSS Statistics software as well as to introduce a few subjects on more advanced statistics using IBM SPSS Statistics software.

Content: The course begins with a brief review of basic statistical concepts and tests followed by more detailed instruction on: (i) Multiple regression including mediation/moderation; (ii) Factorial ANOVAs, (iii) Logistic regression, (iv) Multi-Level Modelling; and (v) Systematic Review and Meta-analyses. Please note that this course assumes previous undergraduate knowledge of introductory statistics. It is recommended that if you need a brush-up, you review the suggested readings for the first two days of class before the course begins.

Format and Evaluation: The course includes a combination of lectures and practical instruction using SPSS. Focus will be on giving participants hands-on experience with each type of analysis. Practical exercises will be assigned for each session; some of these exercises will be done collectively during the teaching day and others must be completed independently.

The course consists of five modules in total. In order to receive a certificate of completion and ECTS points for a module, participants must submit and receive approval of the corresponding assignment. The specific number of ECTS points awarded is determined as follows: 1 assignment + 2 days of attendance = 3 ECTS (1 module); 2 assignments + 4 days of attendance = 6 ECTS points (2 modules); 3 assignments + 6 days of attendance = 9 ECTS points (3 modules), 4 assignments and 8 days of attendance = 12 ECTS points (4 modules), all 5 assignments + full attendance (10 days) = 15 ECTS points (5 modules).

Priority will be given to students who can attend all of the course, but it is possible to attend specific modules if space is available. Notice that certification for a module only is awarded if the corresponding assignment is submitted and approved, and that certificates are not sent out, until the whole course is finished.

Expected workload: 100-150 pages per course day as well as homework assignments.

The due dates for the homework assignments are as follows:

Assignment 1: February 23, 9am Assignment 2: March 29, 9am Assignment 3: May 3, 9am Assignment 4: May 24, 9am Assignment 5: June 21, 9am

Please email your assignment in word document or PDF format to the relevant instructor (see email addresses on the cover page).

Getting in Contact with Us

Open dialogue and co-operation is important to us, and we encourage you to use us to your best advantage. If you have questions about the class, special needs, or require clarification regarding the course requirements, please ask! Similarly, if you are having difficulty understanding something, don't stay quiet. We can't help you if you don't let us know that you're having trouble!

Readings and Resources: The core reading material is Field, A. (2018). *Discovering Statistics Using SPSS, 5th Edition.*

An 'Additional Reading' list is also outlined in this booklet. These readings are not part of the core curriculum for this course but are listed here for your information, as some of you may find it helpful to consult a secondary or more advanced resource if and when you have to run these analyses on your own.

A Brightspace webpage will be made for the course where we will upload PowerPoint slides, answers for the assignments, links to additional materials, etc. Announcements will also be posted on the course website throughout the semester, so please ensure you can receive emails from the system.

A detailed schedule and core/additional reading lists for the course are provided on the following pages. Please note that minor modifications to the schedule may be required as the course progresses.

Venue

Aarhus University, Bartholins Allé 10, building 1325, room 440.

Module 1: (1/2-2/2). Module 2: (7/3-8/3). Module 3: (18/4-19/4). Module 4: (6/5-7/5). Module 5: (13/6-14/6).

Please note that the start time on DAY 1 of each teaching block is **10:00** to 15:30. On DAY 2 of each teaching block the start time is **09:00** to15:30

Detailed Course Schedule and Reading List

	Date		Content	Literature
1.	01.02.23	SP	Fundamentals I Review of the SPSS, statistical assumptions, correlation.	Field, A. (2018) chapters 1 - 7, 10
2.	02.02.23	SP	Fundamentals II T-tests, effect sizes, confidence intervals, missing data, sample size and power analysis, introduction to Bayesian statistics, bootstrapping.	Field, A. (2018) chapters 12,15
3.	07.03.23	AA	Linear regression I Simple and multivariate regression	Field, A. (2018) chapters 8 - 9
4.	08.03.23	AA	Linear regression II Mediation and moderation in regression	Field, A. (2018) chapter 11
5.	18.04.23	SP	ANOVAs I One way and repeated measures ANOVA, Factorial ANOVA	Field, A. (2018) chapters 14 - 16
6.	19.04.23	SP	ANOVAs II & Categorical data analysis Mixed ANOVA, X ² , logistic regression	Field, A. (2018) chapters 19 - 20
7.	06.05.23	MSO	Multi-Level Modelling I	Field, A. (2018) chapter 21
8.	07.05.23	MSO	Multi-Level Modelling II	Field, A. (2018) chapter 21
9.	13.06.23	BZ	Systematic Review and Meta- analyses I	Zachariae, R. (2022): A brief introduction to systematic review and meta-analysis (unpublished handout)
10.	14.06.23	BZ	Systematic Review and Meta- analyses II	Zachariae, R. (2022): A brief introduction to systematic review and meta-analysis (unpublished handout)

Core Readings:

- Field, A. (2018). *Discovering Statistics Using SPSS, 5th Edition.* Sage Publications.
- Field, A., Miles, J. & Field, Z. (2012). Discovering Statistics using R (chapter 3, pp. 62-115). Sage Publications

Additional Readings

- American Psychological Association (2009). *Publication manual of the American Psychological Association (6th ed.)*. Washington, DC: American Psychological Association.
- Baguley, T. (2012). *Serious stats: A guide to advanced statistics for the behavioural sciences*. New York, NY: Palgrave MacMillan.
- Bandalos, D. L. & Finney, S. J. (2010). Factor analysis: Exploratory and confirmatory. In G. R. Hancock & R.O. Mueller (Eds.). *The reviewer's guide to quantitative methods in the social sciences* (pp. 93-114). New York, NY: Routledge.
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research.* New York, NY: Guilford.
- Byrne, B. (2016). *Structural equation modeling with Amos: Basic concepts, applications, and programming (3rd ed.)*. New York, NY: Routledge.
- Camerer, C. F., Dreber, A., Holzmeister, F., Ho, T.-H., Huber, J., Johannesson, M. et al., (2018). Evaluating the replicability of social science experiments in Nature and Science between 2010 and 2015. *Nature: Human Behaviour, 2*, 637-644.

Cummings, G. (2014). The new statistics: Why and how? *Psychological Science*, 25, 7-29.

Cummings, G., & Calin-Jageman, R. (2017). *Introduction to the New Statistics: Estimation, Open Science, and Beyond.* New York: Routledge.

- Field, A., & Hole, G. (2003). *How to report and design experiments*. London: Sage.
- Gamst, G., Meyers, L.S., & Guarino, A.J. (2008). *Analysis of variance designs.* Cambridge: Cambridge University Press.
- Hayes, A. F. (2013). Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach: Guilford Publications.
- Heck, R.H., Thomas, S.L., Tabata, L.N. (2014). *Multilevel and longitudinal modelling with IBM SPSS* (2nd ed). New York, NY: Routledge.

- Hoekstra, R., Kiers, H.A.L., Johnson, A. (2012). Are assumptions of well-known statistical techniques checked, and why (not)? *Frontiers in Psychology*, *3*, 1-9.
- Kline, R. B. (2011) *Principles and practices of structural equation modeling* (3rd ed.). New York, NY: The Guilford press.
- Lance, C. E., & Vandenberg, R. L. (2010). *Statistical and methodological myths and urban legends*. Routledge: New York, US.
- Mueller, R. O. & Hancock, G. R. (2010). Structural equation modeling. In G. R. Hancock & R.O. Mueller (Eds.). *The reviewer's guide to quantitative methods in the social sciences* (pp. 371-384). New York, NY: Routledge.
- Pallant, J. (2010). SPSS survival manual (4th ed). Maidenhead, England: McGraw Hill.
- Palij, M. (2012). Review of Cummings Understanding the new statistics: Effect sizes, confidence intervals, and meta-analysis. *PsycCRITIQUES*, *57* (24).
- Simonsohn, U., Nelson, L. D., & Simmons, J. P. (2014). P-curve: A key to the filedrawer. *Journal of Experimental Psychology: General, 143*, 534-547.

Tabachnick, B.G., & Fidell, L.S. (2012). Using Multivariate Statistics (6th ed.). Pearson.

Wagenmakers, E.-J. (2007). A practical solution to the pervasive problem of *p* values. *Psychological Bulletin & Review, 14*, 779-804.