



## ONLINE Ljubljana Doctoral Summer School 2021

### Quantitative Data Analysis: Issues & Applications

(ECTS: 4)

19 – 23 July

9.00 – 13.00 (CEST, Ljubljana)

Course leader:

Halkias Georgios, Technical University of Munich, Germany

#### Aims of the course:

Sound knowledge of quantitative analysis is an essential requirement in many disciplines – more than one would expect! This course seeks to equip students with a critical understanding of (a) key concepts of statistical inference (e.g., Type I and II error, statistical significance & NHST, effect size, statistical power) and (b) different methods of data analysis (e.g., analysis of (co)variance, linear and logistic regression, moderation, factor analysis).

The course integrates analytical theory with practical examples in a logical and straightforward manner in order to guide students through different techniques of quantitative data analysis. As such, it is targeted to doctoral students who either feel they lack a solid analytical background or simply want to refresh and improve their analytical and statistical inference skills.

After taking this course, students will be able to:

- Understand the logic and principles of quantitative data analysis.
- Improve statistical inference skills.
- Apply the appropriate analytical techniques to answer different research questions.
- Interpret and critically assess research results.
- Identify not-that-obvious information.
- Draw valid conclusions to improve decision-making.
- Familiarize themselves with the IBM SPSS interface.

#### Course syllabus:

Day 1	<ul style="list-style-type: none"> <li>● <b>What is statistics &amp; how does it work?</b> <i>Populations &amp; samples</i></li> <li>● <b>Statistical inference I</b> <i>Parameter estimation &amp; hypothesis formulation</i> <i>NHST &amp; everything you need to know about it</i></li> </ul>	<p><i>Reading</i> Field: Chapter 2 D/S: Chapter 2, 6, 9</p>
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Day 2	<ul style="list-style-type: none"> <li>• <b>Statistical inference II</b> <i>Effect size, Sample size, &amp; statistical power</i> <i>Beyond statistical significance...</i></li> <li>• <b>Data quality &amp; analysis bias</b> <i>Measurement, centrality, &amp; variability</i> <i>Statistical assumptions</i></li> </ul>	<i>Reading</i> Field: Chapter 2, 3, 5, 6 D/S: Chapter 1, 3, 8, 10
Day 3	<ul style="list-style-type: none"> <li>• <b>Making comparisons I</b> <i>Chi-square test</i> <i>Independent sample t-test</i> <i>Paired samples t-test</i> <i>One sample t-test</i></li> <li>• <b>Making comparisons II</b> <i>ANOVA</i> <i>ANCOVA</i> <i>Factorial ANOVA</i> <i>(Theory &amp; applications)</i></li> </ul>	<i>Reading</i> Field: Chapter 10, 12, 13, 14, 19 D/S: Chapter 11, 12
Day 4	<ul style="list-style-type: none"> <li>• <b>Investigating relationships I</b> <i>Correlation/Partial correlation</i> <i>Simple linear regression</i></li> <li>• <b>Investigating relationships II</b> <i>Multiple regression/Moderation</i> <i>Logistic regression</i> <i>(Theory &amp; applications)</i></li> </ul>	<i>Reading</i> Field: Chapter 8, 9, 11, 20 D/S: Chapter 13, 14
Day 5	<ul style="list-style-type: none"> <li>• <b>Finding structures</b> <i>Exploratory Factor Analysis</i> <i>Principal Component Analysis</i> <i>(Theory &amp; applications)</i></li> <li>• <b>Overview &amp; key issues</b></li> </ul>	<i>Reading</i> Field: Chapter 18 D/S: Chapter 14

### List of readings:

- Field, A. (2017), *Discovering Statistics Using IBM SPSS Statistics* (5th edition), Sage Publications: London. – Referred to as “Field” in course syllabus.
- Diamantopoulos, D. and Schlegelmilch, B. (2000), *Taking the Fear out of Data Analysis* (2nd edition), South-Western CENGAGE Learning: London. – Referred to as “D/S” in course syllabus.

### Examination:

Sessions combine theory, real-life examples, and (interactive) visual material in a way that enables effective understanding of different concepts/approaches of quantitative data analysis and statistics. Course evaluation is based on the following dimensions:





### Class participation (20%)

Participation in class is highly encouraged. Students are rewarded for their contribution to the class discussion by engaging in the issues discussed and raising relevant issues/concerns and suggestions.

### Individual assignment (40%)

The individual assignment refers to a project conducted by individual students and involves data analysis, interpretation, presentation, and reporting of results. Students are provided with a dataset and are asked to analyse it in order to address a series of managerial issues. The deliverable for the assignment is a brief written report of 8–10 pages submitted after the end of the course. More details will be provided in class.

### Case study (40%)

The case study quiz consists of ~3 mini cases that describe a research problem, present the results of the analysis, and invite students to interpret the output and critical assess the findings.

### **Prerequisites:**

This course covers all fundamental issues pertaining to quantitative data analysis. As such, it does not require prior knowledge of statistics. That said; having attended a general introductory course in research methods would benefit students in more effectively understanding the issues covered throughout.

### **Course leader's biographical note:**

*Georgios Halkias is Associate Professor at the TUM School of Management and Visiting Professor at the University of Vienna. His research has received several international distinctions and has been published in AJG 4/4\*, FT 50 and other leading journals including, among others, the Journal of International Business Studies, International Journal of Research in Marketing, British Journal of Management, Journal of Advertising, and Journal of Business Research. Georgios sits on the Editorial Review Board of the Journal of International Marketing and has been awarded with the "Outstanding Reviewer Award 2020" from the International Marketing Review). He teaches various courses on research methods, data analysis, and consumer behaviour and he is the recipient of the "Best Teaching Award 2017" for outstanding teaching at the graduate level (University of Vienna).*