Lecture 1

Empirical Research Methods
IN4304

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Today

- General information about the module
  - Programme
  - Assessment
  - Assigning students to topics
- An introduction to Research philosophy

Learning outcomes of lecture 1

After today's lecture you should :

- have better understanding of what this module is about
- know how your performance in this module will be assessed
- Know the difference between Rationalism and Empiricism
- have a concept of standard scientific approaches
- have a concept of alternative scientific approaches

Aim of the Module

To achieve understanding of empirical research methods and obtain practical experience with quantitative data analysis methods.

Module learning outcomes

1. Recognise and begin to utilise appropriate strategies for carrying out empirical research for answering research questions
2. Appreciate how empirical research is conducted and findings can be evaluated
3. Understand key principles underlying statistical data analysis
4. Develop and apply appropriate research strategy and measure instruments
5. Successfully use statistical software tools to analyse data.

Teaching Method

Lectures

Theories, principles and methods are presented and discussed. Demonstrations in the use of SPSS

Practicum

students work in small groups (2 to 3 students) on assignments and discuss them with an instructor. The instructors will also provide practical guidance on the use of SPSS.

Timetable

Quarter 3

- Lectures: EWI Lecture room C, Tuesday 13:45-15:45
- Practicum: Drebbelweg 1-150, Thursday 15:45-17:45

Quarter 4

- Lectures: EWI College room B, Tuesday 15:45-17:45
- Practicum: Drebbelweg 1-150, Thursday 10:45-12:45

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Lecture Program

Quarter 3

1. Introduction
2. Research Plan
3. Experimental Design
4. Surveys and Questionnaires
5. Observational methods
6. Data preparation
7. Qualitative data analysis I – Differences

Quarter 4

1. Qualitative data analysis II – Relations
2. Judgement measures in Visual Perceptions
3. Qualitative oriented research <no lecture>
4. <no lecture>
5. <no lecture>
6. <kept in reserve>
7. Exam training

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Practicum Program

Quarter 3

1. Register groups
2. Research plan
3. Experimental design
4. Measure instrument
5. Entering data, reliability
6. Explorative data analysis
7. Data analysis (chi-square, t-test…)

Quarter 4

10. Data analysis (ANOVA)
11. Data analysis (ANOVA with repeated measures)
12. Data analysis (MANOVA)
13. <no practicum>
14. Data analysis (Correlation and regression)
15. Power analysis and sample size
16. <kept in reserve>
17. <kept in reserve>

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Assessment

Written examination	(70%)
Coursework project (resulting in a report)	(30%)

An overall pass mark can only be obtained if a pass mark has been obtained for both the individual exam and the group coursework project.

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Coursework

- Students will work in small groups (2 to 3 students) on a coursework assignment which includes:
  - Part A: the design and set-up of empirical research study
  - Part B: the design of a measurement instrument
  - Part C: the statistical analysis of a dataset by using SPSS
- Assignment (and data sets) can be found on Blackboard including instructions on which version you should do.
- Everything should be submitted online in a single report by 11/6/2010.

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Coursework – Part A

The design and set-up of empirical research study

- Domain 0: Avatars, 1: Negotiation, and 3: Speaking in Public
- Domain = modulo 3 of the Sum of the student ID number of your group.

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Coursework – Part A

Research Plan should include at least:

- Motivation of the research
- Research questions considering at least two constructs
  - A research question with a focus on difference
  - A research question with a focus on relationship
- Conceptual models
- Operationalisation constructs
- Experimental Design
- Sample size
- Sampling method
- Experimental Procedure
- Recruitment Procedure of participants
- Material
- Measures
- Suggested Statistical Analyses

Coursework – Part B

The design of a measurement instrument

- Version 0: based on Likert Scales own domain
- Version 1: based on Semantic Differential Scales own domain
- Version 2: Thurstone's method of equal-appearing intervals based on domain of Part A
- Version = modulo 3 of the Sum of the age (in years) of the student member of your group.

Coursework – Part C

The statistical analysis of a dataset by using SPSS

- Fictitious Data set 0..9 about user perception of avatars
- Data set number = modulo 10 of the Sum of the student ID number of your group
- 17 data analysis questions
- All and **only appropriate** and relevant analysis output should be included in the report.

Reading Material

Primary reading list

- Robson, C., (2002) *Real world research: A resource for social scientists and practitioner-researchers* (2nd ed). Malden: MA, Blackwell.
- Brinkman, W.-P., (2009) Chapter 3: Questionnaire design, In *Handbook of Mobile Technology Research Methods*, Nova Publisher. *(draft version available on blackboard).*

Secondary reading list

- Field, A. (2005). *Discovering statistics using SPSS*. London, UK, SAGE.

Study hours

Lectures: 20 hours (10 × 2 hours lectures)
Reading time: 40 hours (10 × 4 hours reading time for each lecture)
Instruction/lab: 24 hours (12 × 2 hours Instruction)
Coursework project: 40 hours
Exam preparation and revision: 16 hours

Total = 140 hours

Class Question

- Write down what you think what is meant with scientific research.

A Scientific Attitude

Scientific Research is being carried out:

- Systematically
- Sceptically
- Ethically

(Robson, 2002)

Norms of the Scientific Community

- Universalism
- Organized skepticism
- Disinterestedness
- Communalism
- Honesty

(Neuman, 1997)

Some History - Rationalism

Rationalism:

- Knowledge is established from (intellectual and deductive) reasoning
- Independent of experience taking Mathematics as example aims at establishing universal systems
- **René Descartes** you can not trust your senses

Some History - Empiricism

- Knowledge is derived from experiences
- Don't belief knowledge can be obtained from innate "truths" (intuition)
- Theories must be tested with observations
- **Francis Bacon:** Inductive reasoning from fact to axiom to laws

Some History - Critical rationalism

- Scientific theories and knowledge claims should be rationally criticized
- If they have empirical content this should be subjected to tests which may falsify them
- Instead of looking for support of hypothesis, research should look for ways to falsify hypothesis (theories).

Positivism

- Standard view of science
- *"Positivism sees social sciences as an organized method for combining deductive logic with prices empirical observations of individual behaviour in order to discover and confirm a set of probabilistic causal laws that can be used to predict general patterns of human activity."* (Neuman, 1997, p, 63)
- Assumes that there is a single concrete reality out
- Scientist should be as objective and unbiased in their investigation in order to find the truth.

Assumptions of positivism

1. Objective knowledge obtain from direct observation is only knowledge available to science. (invisible or theoretical entities are rejected)
2. Science separates facts from values
3. Science is largely based on quantitative data, derived from the use of strict rules and procedures
4. All scientific propositions are founded on facts. Hypotheses are tested against these facts
5. The purpose of science is to develop universal causal laws.
6. Cause is established through demonstrating such empirical regularities
7. Explaining an event is simply relating it to a general law
8. It is possible to transfer the assumptions and methods of natural science from natural to social science

(Robson, 2002, p.20)

Class question

- Write down some critique on positivism
- (think about the subject of research)

Critiques of positivism

1. The claim that direct experience can provide a sound basis for scientific knowledge is open to question
2. The view that science should deal only with observable phenomena is rejected
3. It is impossible to distinguish between the language of observation and of theory
4. Theoretical concepts do not have a 1:1 correspondence with 'reality' as it is observed
5. Scientific laws are not based on constant conjunctions between events in the world
6. 'Facts' and 'values' cannot be separated (Robson, 2002, p.22)

Some critiques of positivism and social research

- Social phenomena exists not 'out there' but in the minds of people and their interpretations
- Reality cannot be defined objectively but only subjectively: reality is interpreted social action
- Standardization results in converting the social world under study into an artificial world which has nothing in common with the real world.

(Robson, 2002, p.23)

Other views – Relativistic approaches

- Qualitative approach (not the same as qualitative data) such as constructivist, naturalistic, interpretive, and ecological.
- Rejection 'truth' in social science can be established by using natural science methods because subject of research are **humans** .
- Humans are conscious, purposive actors, have ideas about the world and attach meaning to world. This influence their behaviour
- Example of woman going to kitchen

Relativistic approaches

- Research should focus on meanings of action in social context not on isolated, 'objective' unit behaviour
- Research is relationship between research and participants
- Focus not only on cause-effect relationships, but also people and and their perceptions and experience of the world
- To capture life as it is
- Induction is preferred to the hypothetico-deductive approach.

(Coolican, 2004, p.224-226)

Qualitative Approaches

- Open-ended questionnaires
- Unstructured and semi-structured interviews
- Qualitative observations
- Participant observation
- The diary method
- Role-play and simulations
- Individual case studies

(Coolican, 2004, p.226-227)

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Summary

- **Focus** on empirical research methods and obtain practical experience with quantitative data analysis methods
- **Assessment**: Written exam and coursework
- All details about module can be found in **syllabus** on blackboard

- **Rationalism**: Knowledge is established from reasoning
- **Empiricism**: knowledge is established from experiences
- **Positivism**: Use deductive logic and empirical observation in searching causal laws
- **Alternative scientific approaches**: can not apply natural science methods to study humans

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This week in practicum

- Forming groups
- Coursework assignment
- Assignment case study and data set

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Next time

(9/2/2010) **Research plan**

- Formulating research question (Robson ch. 3)
- Conceptual research models
- Type of research (Robson ch. 4)

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References

- Coolican, H., (2004). *Research methods and statistics in psychology* (4th ed). London, UK: Hodder Arnold.
- Neuman, W.L., (1997). *Social research methods; Qualitative and quantitative approaches.* (3rd ed). Boston, MA: Allyn and Bacon.
- Robson, C., (2002) *Real world research: A resource for social scientists and practitioner-researchers* (2nd ed). Malden: MA, Blackwell.

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