Case Study Data Analysis and Interpretation

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Outline

- Data Analysis
- Interpretation
- Reporting Case Studies

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Data Analysis and Interpretation

- Quantitative
- Qualitative
- Validity

Quantitative

- Summarize the collected data using descriptive statistics
  - Mean values
  - Standard Deviations
  - Histograms
  - Scatter Plots
- Draw conclusions
  - Correlation analysis and predictive models
  - Hypothesis Testing
- Typically assumes there is a fixed research design

Qualitative

- Derives conclusions from data -> requires chain of evidence
  - Thus, must track sufficient information for each step of the study and each decision made
- Analysis may be carried out in parallel with data collection
  - Implies need for systematic analysis techniques
  - Often means over course of the study new instruments and data collection techniques must be used
- Often requires multiple researchers to reduce bias

General Techniques

- Qualitative techniques come in two general forms
  - **Hypothesis generation** -> find hypotheses from data
  - **Hypothesis confirmation** -> confirm if a hypothesis is really true
    - Triangulation
    - Replication
    - **Negative case analysis** -> attempts to reject hypotheses

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Qualitative Analysis Approach

1. Data is coded -> where codes represent themes, areas, constructs
   - Codes tend to form a hierarchy
2. The coded material is combined based on comments and reflections of the researcher
3. From this material an initial set of hypotheses is extracted
4. As more data is collected the hypotheses are revised
5. As steps 3 and 4 are iterated upon, generalizations are formed leading to a body of knowledge

- We should note that the progression is not linear but rather interleaved with each step potentially affecting the others
- Tool support ranges from simple tabulation in spreadsheets to advanced tools such as NVivo and Atlas.

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Formalism

- **Immersion approaches**: least structured and rely more on intuition and interpretive skill of the researcher
- **Editing approaches**: focus on codes discovered during analysis rather than a priori codes
  - Grounded Theory
- **Template approaches**: more formal and rely more upon a priori codes based on research questions
  - Similar to the approach used in SMS coding
- **Quasi-statistical approaches**: very formalized and utilize word/phrase frequency calculations.
  - Using NLP approaches rather than coding theory

Validity

Again, we need to discuss the concepts of

- Construct validity
- Internal validity
- External validity
- Reliability

At the level of reporting, rather than thinking about what could be issues with validity, we must instead address the actual issues with the study.

Reporting and Dissemination

- Reporting is integral to any study and thus we must discuss the different aspects of a report:
  - Why and what to report
  - Characteristics of the report
  - Report Structure
- Since different types of studies have different key characteristics, and reports may have different audiences, we need tailor the report.

Characteristics

The key characteristics of a Case Study report are the following

- Tells what the story was about
- Communicates a clear sense of the studied case
- Provides a “history of the inquiry”
- Provides basic data in focused form
- Articulates the researchers conclusions and sets them into a context they affect

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Report Structure

Section	Subsections
Title Authorship Structured Abstract	
Introduction	Problem Statement Research Objectives Context
Related Work	Earlier Studies Theory
Case Study Design	Research Questions Case and Subject Selection Data Collection Procedure(s) Analysis Procedure(s) Validity Procedure(s)

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Report Structure

Section	Subsections
Results	Case and subject descriptions, covering execution, analysis and interpretation issues Subsections, which may be structured e.g. according to coding scheme, each linking observations to conclusions Evaluation of validity
Conclusions and Future Work	Summary of findings Relation to existing evidence Impact / implications Limitations Future Work
Acknowledgments References Appendices	

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Are there any questions?

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