Lecture One: Introduction to Research Methodology and Design

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Overview

• Lecture One: Introduction to Methodology
• Lecture Two: Overview of Research Design
  – QUANT and QUAL
• Lecture Three: Mixed Methods
Lecture One: Introduction to Research Methodology and Design

- Definition of key terms
- The structure of knowledge
- Essential attributes of research
Antonio Gramsci

- An Italian political scientist (Marxist), most well known for his theories on civil society vs. political society.
  - he said “the point of modernity is to live a life without illusions while not becoming disillusioned”.
  - modernity is a rejection of the traditional in favour of the principles of the Enlightenment (reason and analysis)
  - why is this relevant to research methodology?
    - what is research?
    - what is (scientific) knowledge?
    - what is reality?
Outline of Dissertation Process

Lecture 1
- Theories of Knowledge
  - Research Problem & Proposal
    - Ethical Issues
    - Background & Literature
      - Research Design
        - Data Collection
          - Data Analysis
            - Report Writing
Key Definitions

• What is RESEARCH?
  – An activity whose purpose is the generation of new knowledge by means of scientific method(s)

• In more detail ...
  – Frascati Manual (OECD); research and experimental development comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man (sic), culture and society, and the use of this stock of knowledge to devise new applications
The Construction of Knowledge

Deduction

- Theory
- Hypothesis
- Research Design

Induction

- Analysis and Interpretation
- Data Collection
- Observation
- Research Questions
Theory and Practice

• Theory is when you know everything but nothing works
• Practice is when everything works but no one knows why
• In our lab, theory and practice are combined. Nothing works and no one knows why.
Induction vs. Deduction

• Induction is the development of argument from the specific to the general (or theoretical)
• Deduction is the development of argument from the general to the specific
Key Definitions 2

• What is RESEARCH METHODOLOGY?
  – body of knowledge which attempts to explain/understand (and hence develop structure for) ‘how research is done’
  – the various steps that are generally adopted by a researcher in studying his research problem (method) together with the associated logic (what and why)

• What is RESEARCH METHOD?
  – the specific process or steps followed by researchers in undertaking research (experimental design, data collection, etc)

• What is RESEARCH DESIGN?
  – the overview or plan of the actual steps (c.f. the architect’s drawings of a house vs. the builders steps)
Key Definitions 3

• What is ONTOLOGY?
  – the (philosophical) study of the categories of being (reality) and the relationships between them (ontology of NSI or knowledge)

• What is EPISTEMOLOGY?
  – the philosophical study of the nature and scope of knowledge (e.g. traditional vs. scientific)

• What is TELEOLOGY?
  – the notion of root cause or objectives; it is an account of a given activity’s or object’s purpose OR a definition of an object or activity based on its purpose (e.g. a car is a form of transport)
Hierarchy of Categories

- Ontology
- Epistemology
- Methodology
- Method
- Teleology
- Process
Ontologies

• The dominant ontological claims:
  – positivism; that there exists a single reality which is constant in time and independent of human experience or the observer
  – constructivism; that there exist multiple realities dependant on the observer (in the extreme form there is no such notion as an objective reality)
  – critical realism; that there exist multiple versions of the ‘knowledge of reality’ but only a single reality
Philosophical Origins of the Bifurcation

- Ludwig Wittgenstein (1889-1951); “scientific evidence”
  - all knowledge claims must be verifiable in experience independent of the observer
  - founder of logical positivism

- Martin Heidegger (1889-1976); “being in the world”
  - research cannot be conducted independent of the observer
  - founder of constructivism
Assumptions of the Experimental Scientific Method (Positivist)

• A belief that there is some kind of ORDER which will be revealed (come to understand) through research
• External reality exists which is a shared or public reality
• Human perception and intellect is reliable (our senses can record and measure)
• Parsimony or simplicity is the ultimate aim
• Generality is possible; we can generalise from the particular to the world at large
## A Comparison of Epistemological Paradigms

<table>
<thead>
<tr>
<th>Positivist</th>
<th>Constructivist</th>
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</thead>
<tbody>
<tr>
<td>Reality is single, objective and apart from the observer</td>
<td>Reality is subjective and multiple</td>
</tr>
<tr>
<td>Quantitative data derived from experiment</td>
<td>Qualitative data derived from observation</td>
</tr>
<tr>
<td>Reliability is most important (repeatable results)</td>
<td>Validity is important (improved by triangulation)</td>
</tr>
<tr>
<td>Deductive</td>
<td>Inductive</td>
</tr>
<tr>
<td>Location is artificial; all variables held constant except the independent variable</td>
<td>Location is natural; not possible to control any variables</td>
</tr>
<tr>
<td>Mainly experimental, preferably with control</td>
<td>Type of research includes ethnographic, participant observation, case studies</td>
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The Praying Mantis

• Observation: in certain conditions (laboratory), the female mantis will eat her mate
• Interpretation:

  – male researchers: the praying mantis, with its forelegs folded as if in prayer, may look pious, but its mating ritual is truly a macabre affair. Once the smaller male is attached to the female's body, she decapitates him, but he continues the act of conjugation for several more days before he dies and is eaten by his voracious mate.
Female Researchers

• Yes, the female praying mantis does sometimes eat her mate. In fact, male mantises will often offer themselves up as food to the female during the mating process, and from a biological standpoint this action makes sense. There's no point to mating with a female who might die from a lack of food before she can lay her eggs and pass the father's genes onto the next generation.

• In some instances, she'll even behead the poor chap before they've consummated their relationship. As it turns out, a male mantid is an even better lover when his brain, which controls inhibition, is detached from his abdominal ganglion, which controls the actual act of copulation. But most instances of sexual suicide in mantids occur in the confines of a laboratory setting. In the wild, scientists believe the male partner gets eaten less than 30% of the time.
Several Types of Research Design

- Qualitative vs quantitative vs mixed methods (see Lecture 2)
- Types of designs
  - Experimental
  - Surveys
  - Case studies
  - Ethnographic studies
  - Evaluation research
  - Participatory action research (actually a separate paradigm)
Essential Attributes in Research

• Marais defines three necessary dimensions of research:
  – Teleological (describe, explore, explain/understand)
  – Constituent (conceptualisation, hypothesis, observation and communication)
  – Epistemic (internal and external validity, reliability, ‘replicability’, objectivity)

• Most research can be judged on the extent to which the three dimensions have been satisfied (was the objective clear; has the due process been follow; is the knowledge of a suitable quality?)
Reference

Epistemic Attributes (Positivist)

- **Internal Validity**: the degree to which the changes in the dependent variable are indeed due to the independent variable (is the relationship causal?)
- **External Validity**: the extent to which the results are generally applicable (outside the sample population)
- **Reliability**: the extent to which the research finding can be repeated by the same researcher/experiment
- **Replicability**: the extent to which the findings can be repeated by another researcher (also objectivity)
## Attributes (Modern)

<table>
<thead>
<tr>
<th>Traditional construct</th>
<th>Underlying issue</th>
<th>Replace with</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal validity</td>
<td>Truth value</td>
<td>Credibility</td>
</tr>
<tr>
<td>External validity</td>
<td>Applicability</td>
<td>Transferability</td>
</tr>
<tr>
<td>Reliability</td>
<td>Consistency</td>
<td>Dependability</td>
</tr>
<tr>
<td>Objectivity</td>
<td>Neutrality</td>
<td>Confirmability</td>
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# Academic Research vs. Management Study

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Academic Research</th>
<th>Management Study</th>
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</thead>
<tbody>
<tr>
<td>External validity</td>
<td>The results can be applied more widely than the unit of research (company or individuals)</td>
<td>The results are only valid to the specific company or individual</td>
</tr>
<tr>
<td>Theory</td>
<td>Builds new theory or tests existing theory</td>
<td>Applies theory but at a simplistic level</td>
</tr>
<tr>
<td>Source of background knowledge</td>
<td>Mostly recent peer-reviewed literature</td>
<td>Mostly trade articles and other management studies</td>
</tr>
<tr>
<td>Teleology</td>
<td>Seeks causative relationship</td>
<td>Focussed on improvements and results</td>
</tr>
<tr>
<td>Methodology</td>
<td>Seeks novelty (insights)</td>
<td>Replication of proven formulas for success</td>
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Class Work

- Fill in three dimensions of the line below

Scientific Knowledge → Evidence is important ← Objectivity is important

Faith

Sentiment (how it makes you feel) is important
Test Yourself

- There appear to be two opposing epistemological positions on the relationship or interdependence between science, society and the individual:
  - relativism which situates science as merely one socially constructed way of knowing among others of equal validity
  - realism, which accords science a greater status as a universally true body of knowledge.

- Realism has been cast as ignoring the influence of social factors on science. Relativism has been pronounced to be impractical and ignorant of the existence of many fundamental laws which are observable independent of the observer.

- Explain the debate between the two epistemological viewpoints, why relativism is considered impractical and suggest how a compromise may be possible.