

# Introduction to Research Methods

Matthew Jones

# What is research?

- A form of systematic enquiry that contributes to knowledge
- Research vs scholarship
  - scholarship is knowledge of one's field
  - research develops new knowledge
  - scholarship is necessary for research
- Research may be:
  - progressive
  - synthetic
  - critical

# Is there just one way to do research?

- In the natural sciences (e.g. physics, chemistry) and most of Engineering there is generally common agreement about how to do research
  - “the” scientific method (more on this later)
- Much manufacturing research, however, will involve management problems
  - can we use methods from the natural sciences to do management research?
  - management researchers disagree about the answer

# One right way?

- Many management researchers say that we should use the methods of the natural sciences
  - gives findings “scientific” credibility
  - enables the production of reliable, replicable generalisable knowledge
- Other researchers argue that reliable, replicable, generalisable knowledge (equivalent to that offered by the natural sciences) is not possible because we are studying human social behaviour

# What difference does this make?

- Humans are not like bosons, birds or bridges
  - they have free will
    - so can behave in non-predictable ways
  - we can understand their behaviour by reference to our own experience (*verstehen*)
    - so we have access to insights on motivation/responses that is not available in the natural sciences
  - they can understand our accounts of their behaviour
    - so they can decide how to respond to them

# So ...

- Research in the natural sciences
  - Studies material objects
  - Objects not influenced by findings
  - Conditions can be manipulated
- Management research
  - Studies human subjects
  - Subjects respond to study & findings
  - Conditions often outside researcher control
    - Difficult to isolate specific effects

=> Need different methods

# Management researchers may therefore disagree about

- philosophical assumptions regarding
  - the nature of being (ontology)
  - what they can know about the phenomena they study (epistemology)
- the types of data best suited to understanding management phenomena
  - numbers (quantitative)
  - words and behaviours (qualitative)
- how research should be conducted
  - research design

# Two “Schools” of management research

- Positivism/functionalism/ objectivism/ mainstream, traditional or conventional
- Interpretivism/ subjectivism/ phenomenological or constructivism



# Positivism

- Applies natural science model to social sciences
  - Strictly speaking an epistemological position (view on what knowledge is possible about the world)
- Claims that we can establish law-like generalisations about (social) phenomena
  - Adopts hypothetico-deductive method
    - testing of a priori theory against data
    - or development of testable theory
- Typically adopts a realist ontology (view on what the world consists of)
  - “reality” exists independently of the perceiving subject
- Tends to use quantitative data (numbers), though can also use qualitative data (words, behaviours)

# “The” scientific/hypothetico-deductive method

- Observation
- Preliminary data gathering
- Theory formulation
- Hypothesising
- Further scientific data collection
- Data analysis
- Deduction

# THE METHODOLOGY OF CONVENTIONAL INQUIRY DOMAIN OF DISCOVERY (NON-SCIENCE)

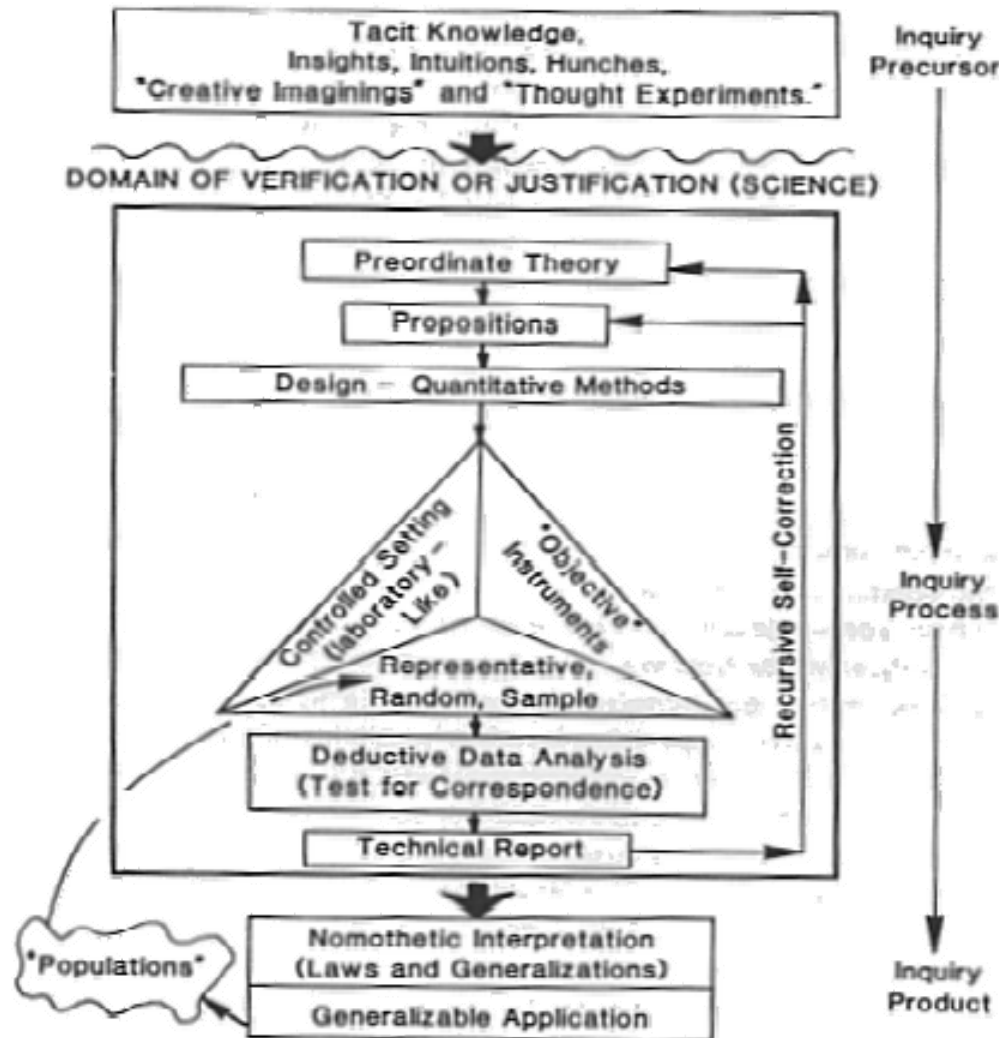


Figure 6.1 The Methodology of Conventional Inquiry

# Interpretivism/constructivism

- Rejects natural science model for social research
- An epistemological position
  - Claims we need to take social actors' ways of seeing the world into account to understand social phenomena
- Typically adopts a Subjective Idealist or Internal Realist ontology
  - social reality is in the mind of the individual or is created by people through their interaction)
- Tends to be inductive
  - Develop theory from observation of empirical reality
- Tends to use qualitative data (but not necessarily)
- Tends to study a few settings in depth
- Tends to focus on how (process) and why?

# What can interpretive research tell us?

- If it does not believe that there can be law-like generalisations about social phenomena, what insights can interpretive research offer?
- Conceptual (rather than statistical) generalisation
  - generation of concepts
  - generation of theory
  - drawing of specific implications
  - contribution of rich insights

## THE METHODOLOGY OF CONSTRUCTIVIST INQUIRY

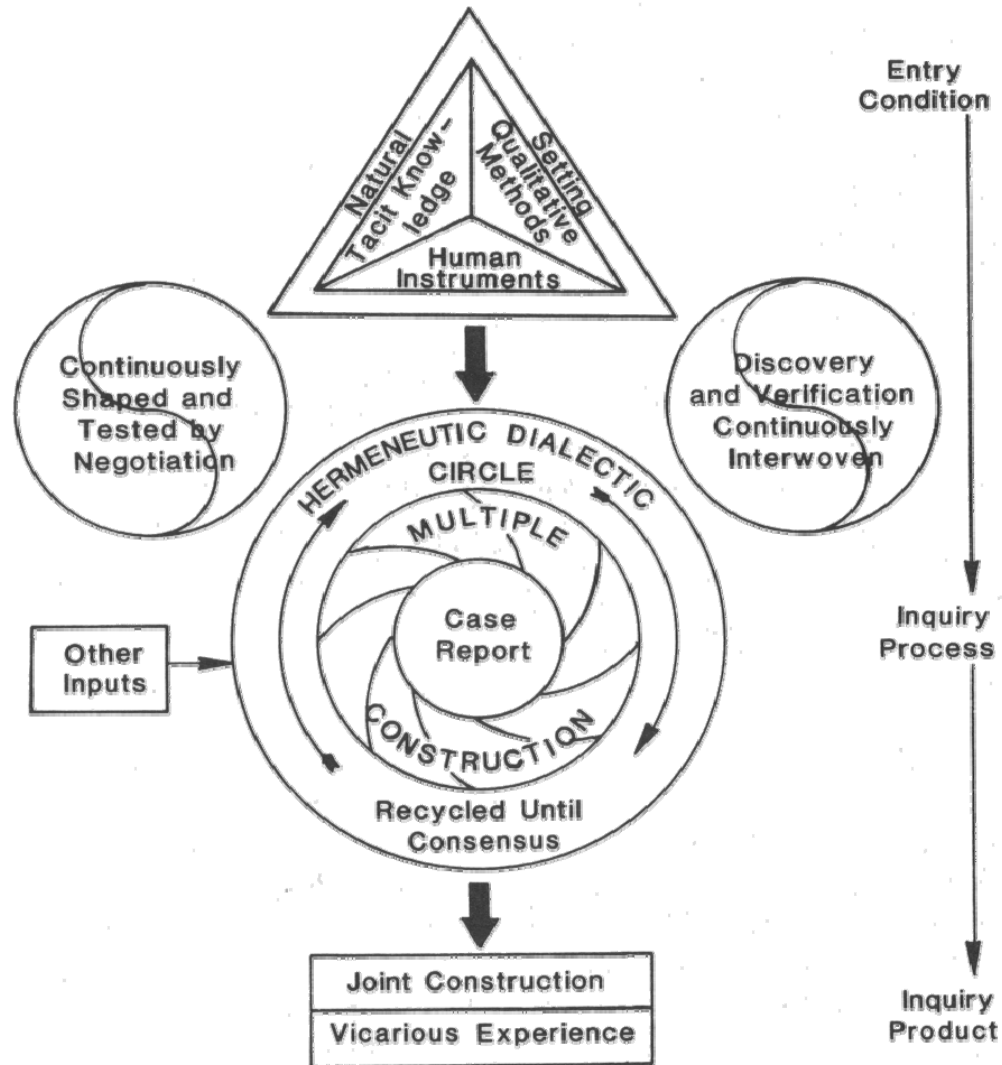


Figure 6.2 The Methodology of Constructivist Inquiry

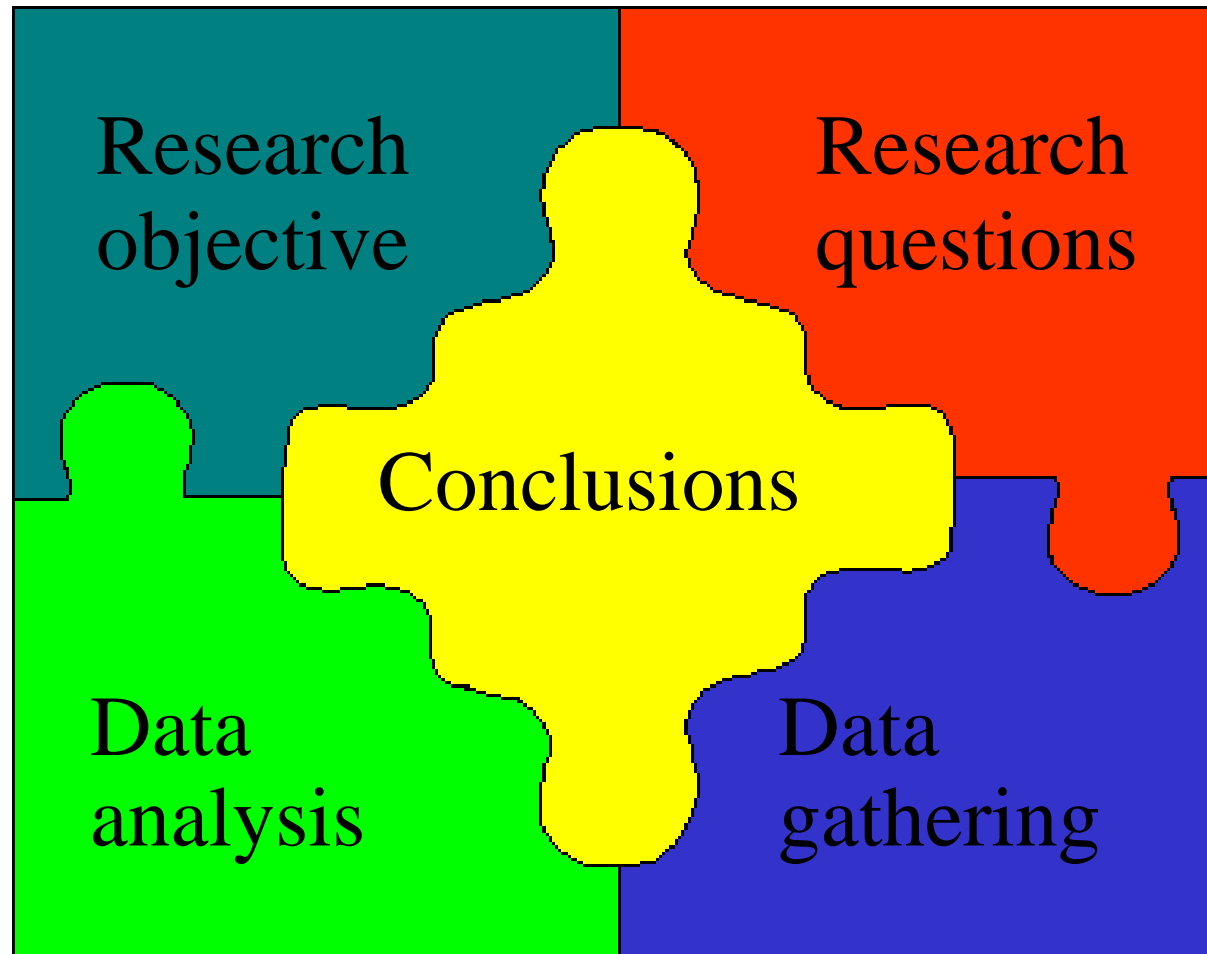
# So ...

- Positivist and interpretive researchers have different views about
  - The logic of research
    - deductive vs inductive
  - The goals of research
    - generalisable laws vs thick descriptions
  - Validity criteria
    - rigour/replicability/objectivity vs dependability/credibility/authenticity
  - Type of knowledge
    - breadth vs depth

# Elements of research design

- Whichever approach to research you choose to follow you need to develop an appropriate research design
  - Research objectives
    - “this research aims to ...”
  - Research question(s)
    - Follow from objectives
      - more specific, answerable by rest of design
    - [may be framed as propositions/hypotheses for positivist design]
  - Data gathering
  - Data analysis
  - Conclusions
    - What knowledge claims/contributions you expect to be able to make





Research design is about ensuring that the pieces fit together and produce a consistent and coherent picture

# Types of Research Design

- Formal/fixed designs
  - Tend to be associated with positivist perspective
  - Experiments
  - Quasi and field experiments
  - Non-experimental fixed designs
- Alternatives to formal designs
  - Not associated with a particular epistemology
    - Case studies
    - Action research
    - Observation
- Internal vs External validity

# Experimental design

- Important because underpins most positivist research designs
- The logic of experimental design
  - Deductive
  - Based on Mills' "method of difference"
    - If there are 2 or more cases and in one of them the observation O can be made, while in the other it cannot, and if variable C occurs when observation O is made and does not when observation O is not made; then it can be asserted that there is a causal relationship between C and O

# The logic of the method of difference

	<i>Variables</i>			<i>Outcome</i>
Condition 1	A	B	C	O
Condition 2	A	B	No C	No O

*Therefore C causes O*

*Independent variable*

*Dependent variable*

# Causality

- Evidence of causality
  - Covariation
  - Time order
  - No other possible causes

BUT

- difficult to demonstrate theoretically as theories inadequate for the isolation of causes
- difficult to demonstrate methodologically
  - survey methods usually do not give temporal sequences
  - => experiments

# True experiments

- Controlled
  - Include (an identical) group that do not receive the 'treatment'
  - Seeks to 'control for' effects of other variables on the dependent variable
  - Allocation to 'treatment' and control groups may be random or systematic
- Issues
  - Ability to control other variables
  - External validity

# Quasi/field experiments (*ex post facto*) design

- Quasi-experiments
  - experiments where random assignment to treatment and control groups has not been used
- Field experiments
  - observe effects of “naturally occurring” events using “natural” controls (groups who do not experience the “treatment”)
  - Non-randomised
  - Usually greater external validity than true experiments (because happened in natural setting)
- Risk of post hoc fallacy

# Non-experimental fixed designs

- Relational designs
  - Measurements made on a range of variables and relationships between scores on different variables are analysed
    - Cross sectional (surveys)
    - Prediction studies
- Comparative designs
  - Analyse differences between two groups
- Longitudinal designs
  - Repeated measures of one or more variables over a period of time
  - Analyse trends



# Surveys

- Often used to assess the incidence of behaviours/ attitudes/dispositions or prevalence of a phenomenon
  - Issues
    - sampling
      - representativeness => claims about population
      - accuracy (variance)
      - statistical power (Type I and Type II errors)
  - Question design
    - wording
    - open and closed questions
  - Question administration
    - online/telephone/postal/face-to-face
  - Response rates

# Analysis of published data

- In many areas of business research, data are published by governments and commercial organisations
  - industry data
  - company accounts/share prices
  - market research
- => Statistical analysis/modelling
- Content analysis of documents, images, video
  - e.g. government or company statements
  - draw inferences about the message, audience
  - appropriate sampling
  - develop robust coding categories and apply to corpus

# Case studies

- Investigate a contemporary phenomenon within its real-life context,
  - boundaries between the phenomenon and its context may not be clearly evident
  - can help to answer how and why questions
  - define topics broadly, not narrowly
  - cover contextual conditions, not just the phenomenon of study
  - multiple sources of evidence
- Single or multiple cases (replication or sampling)
  - Case selection (exemplification, criticality, topicality, feasibility and access)
- May be exploratory, descriptive or explanatory
- May be positivist or interpretivist

# Action research

- The researcher actively intervenes in the research context in order to try to achieve particular outcomes
  - Often used where a researcher has developed a particular technique/methodology and wishes to apply it in practice
  - Can be close to consultancy
- Different approaches (and terminology) e.g. Action science (Argyris, Schon), Soft Systems Methodology (Checkland) Cooperative/Participative Inquiry (Heron, Reason)
- High external validity (real world setting)
  - Can provide evidence of efficacy of intervention
- Issues
  - Risk of post hoc fallacy
  - Risk of researcher bias

# Observation

- Usually in-depth study of few sites
- Aims for “rich description” and understanding of social actors' behaviours and interpretations
  - In anthropology may be described as ethnography
  - May be long term => study processes
  - Enables observer to “get behind the scenes” and understand local meanings
- May be participant or non-participant
  - Researcher tries not to influence behaviour of those observed, and tries to be aware of possible influence
- Issues
  - access
  - personal involvement

# Summary

- Different schools of research
  - Different assumptions
  - Different criteria of what counts as good research
- Different types of design
  - Not necessarily aligned to a particular school of research
  - Need to develop a design that is
    - Complete
    - Consistent (in each of its elements) with assumptions and criteria of the school of research you choose to follow
    - Credible in terms of the norms of the research community to which your work seeks to contribute