



6. Research Onion

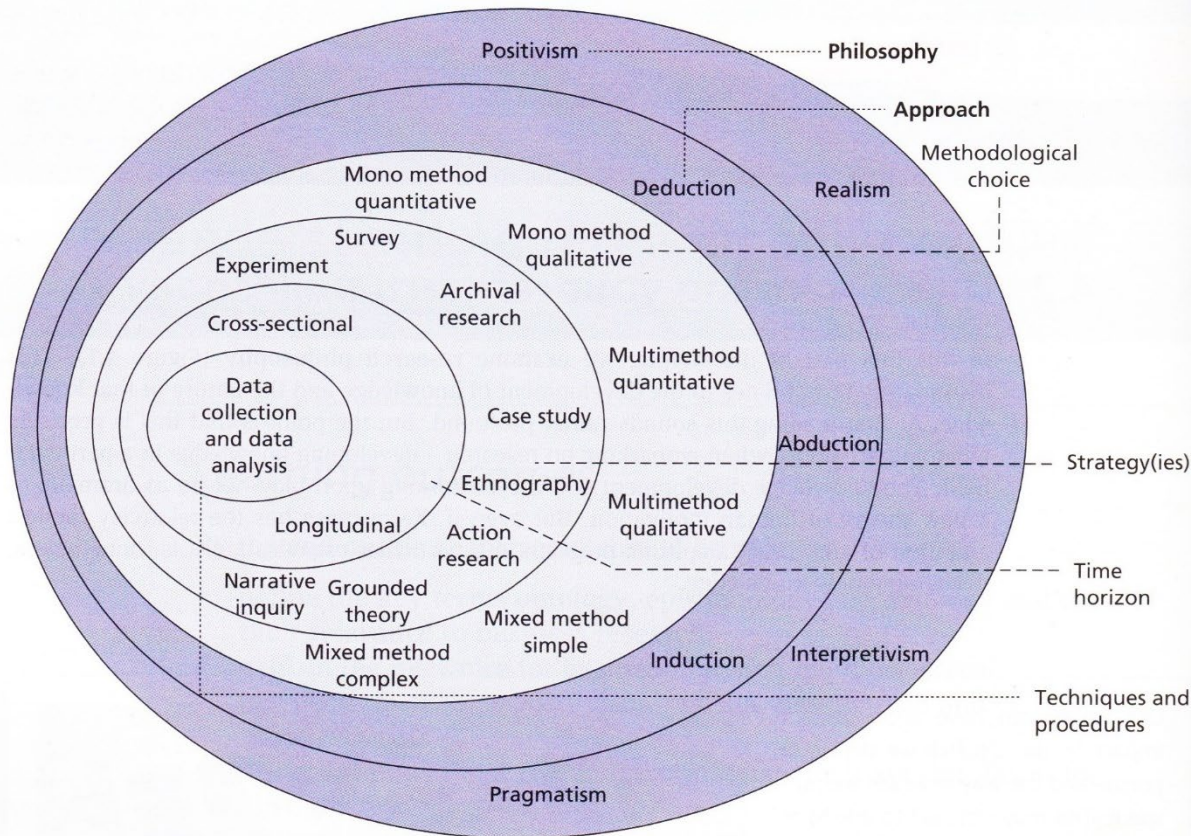
Knut Hinkelmann

(based partly on slides from Prof. Alta van der Merwe)



The Research Onion - Introduction

- Proposed by Saunders, Lewis and Thornhill



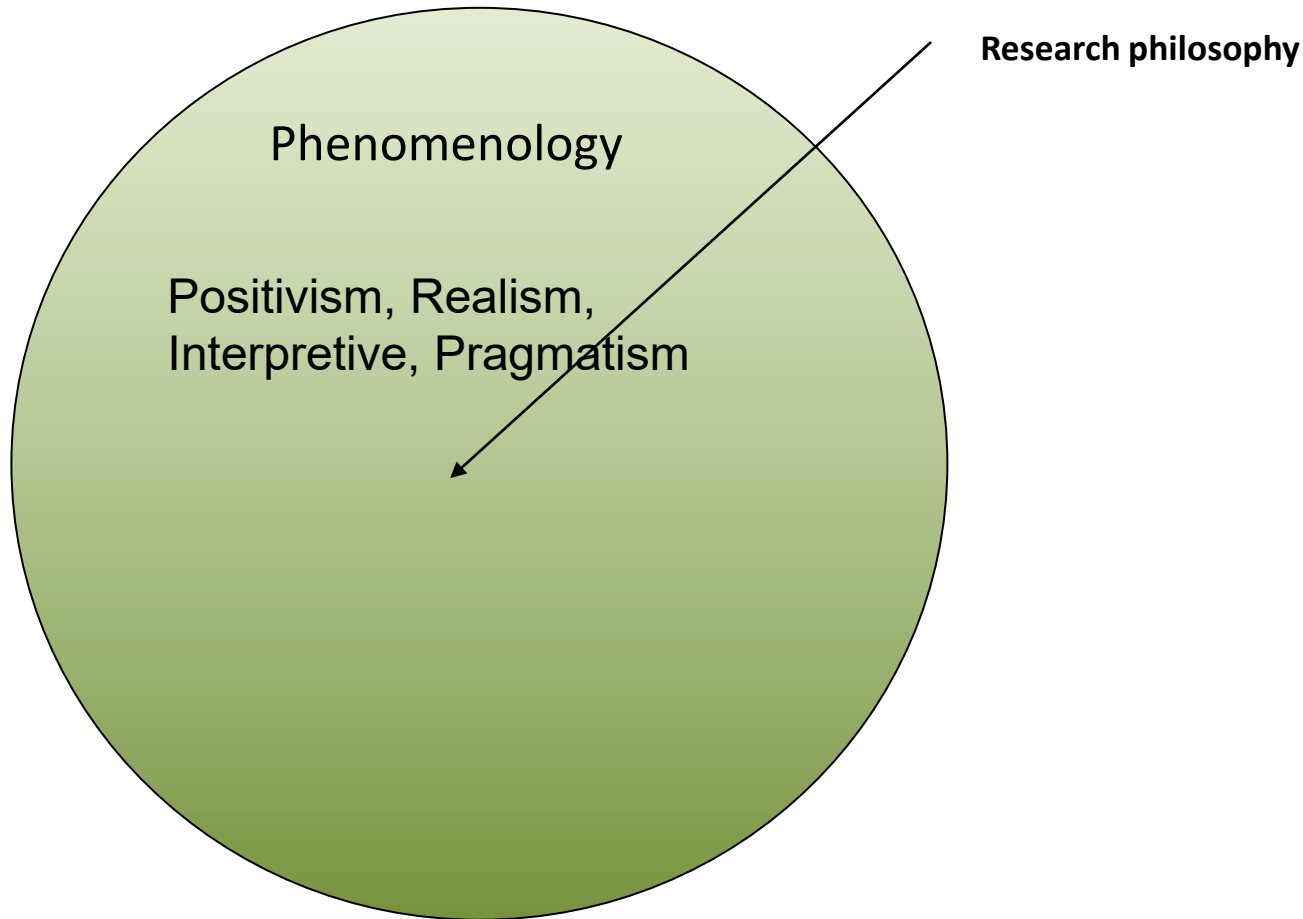
The model symbolized the research design as an onion, consisting of various layers:

- the research philosophy,
- research approach,
- methodological choice
- research strategy,
- time line
- techniques for data collection and analysis.

According to this model, the centre of the research design is the collection of data

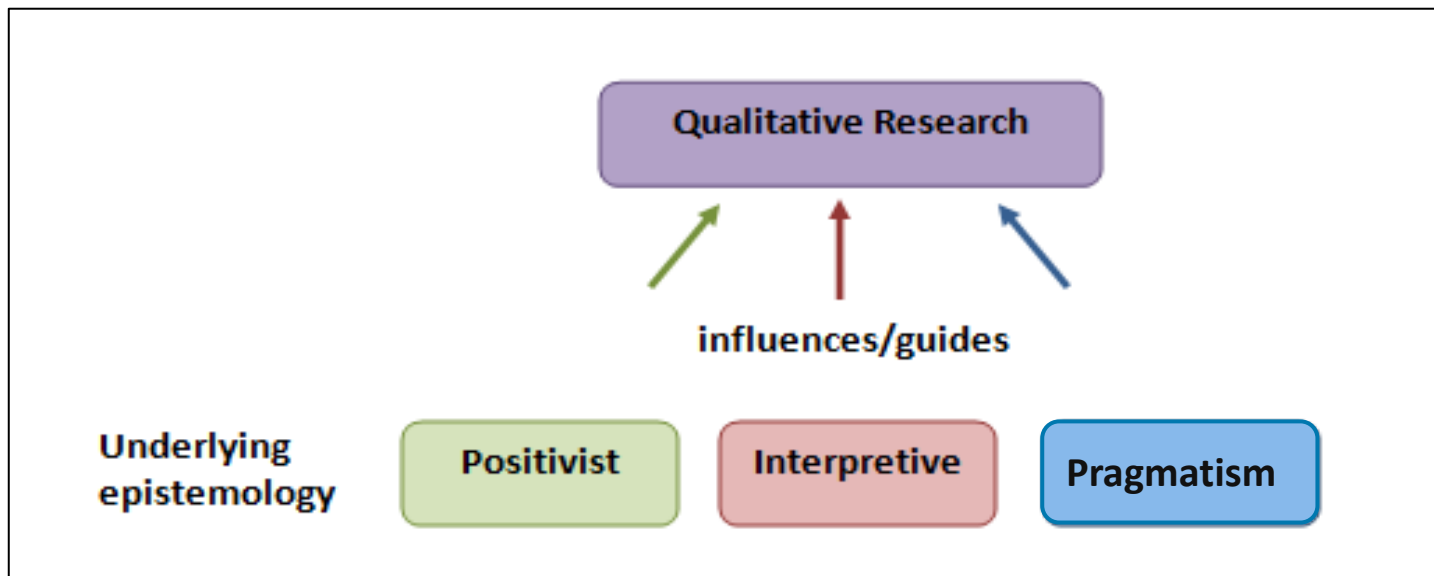
Source: © Mark Saunders, Philip Lewis and Adrian Thornhill 2011

The Research Onion – Research Philosophy



The Research Onion – Research Philosophy

- All research (whether quantitative or qualitative) is based on some underlying assumptions about what constitutes 'valid' research and which research methods are appropriate.



The Research Onion – Research Philosophy

- **Positivists** generally assume that **reality is objectively given** and can be described by measurable properties which are independent of the observer (researcher) and his or her instruments. Studies in information systems is referred to as positivist if there was evidence of formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from the sample to a stated population.
- **Interpretive** researchers start out with the assumption that **access to reality is only through social constructions** such as language, consciousness and shared meanings.
- **Pragmatism** is a practical approach to problems -> typical for Design Science Research

Pragmatism

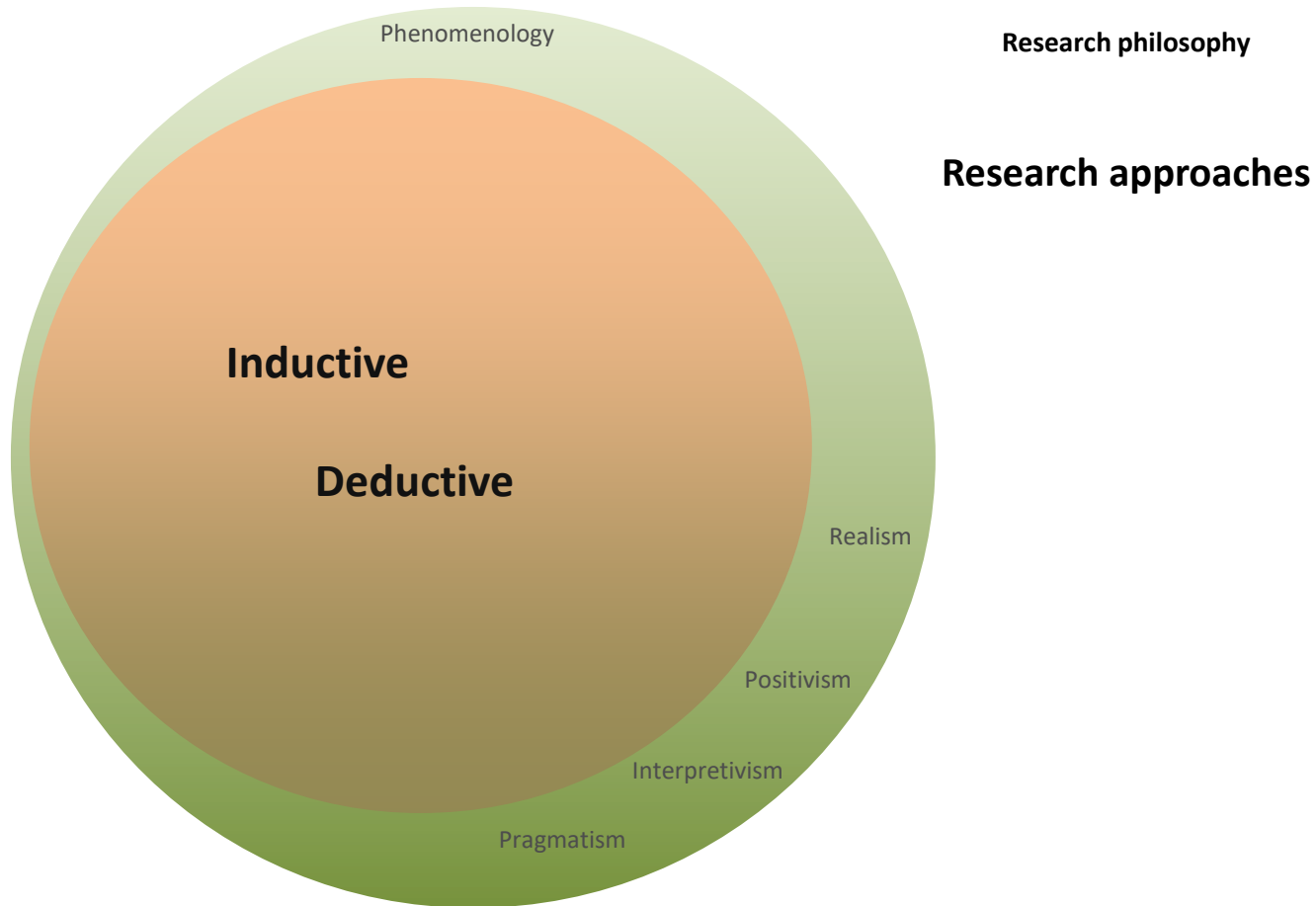
■ Definition of PRAGMATISM

- **1:** a practical approach to problems and affairs <tried to strike a balance between principles and *pragmatism*>
- **2:** an American movement in philosophy founded by C. S. Peirce and William James and marked by the doctrines that the meaning of conceptions is to be sought in their practical bearings, that the function of thought is to guide action, and that truth is preeminently to be tested by the practical consequences of belief

<https://www.merriam-webster.com/dictionary/pragmatism>

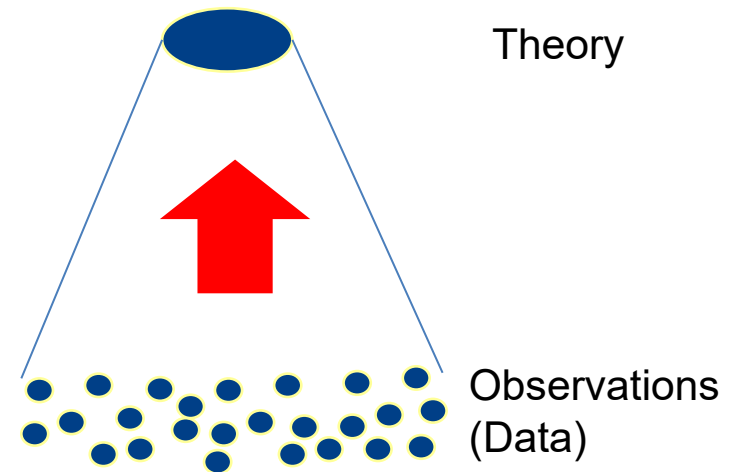
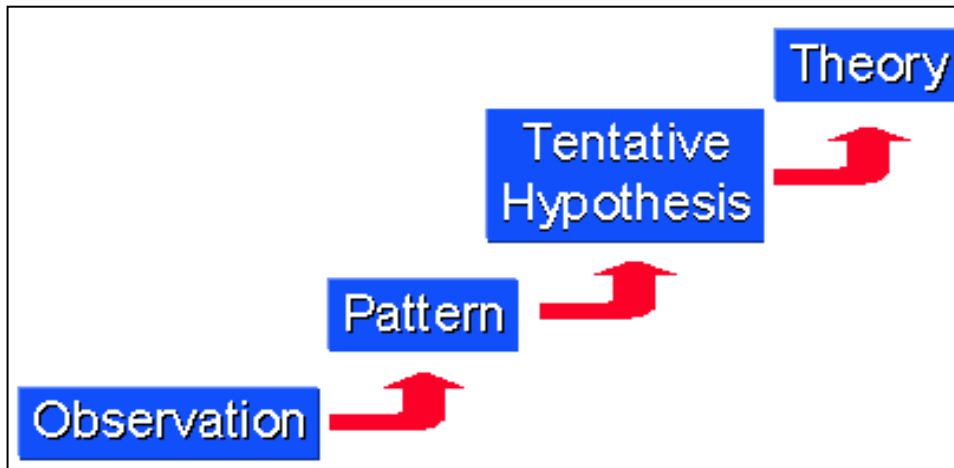


The Research Onion - Approach



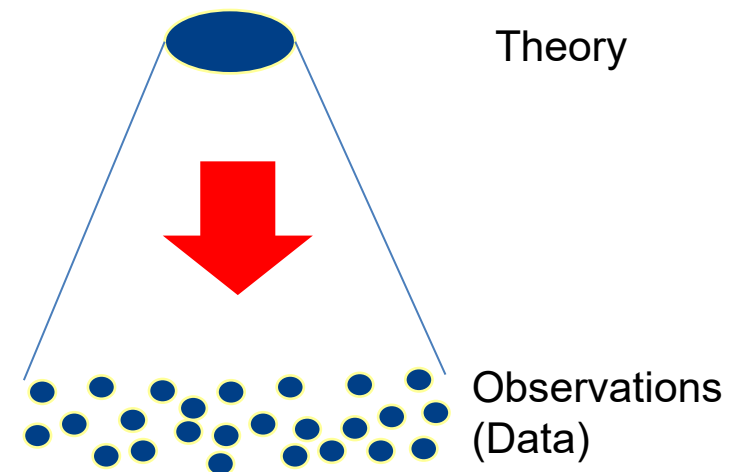
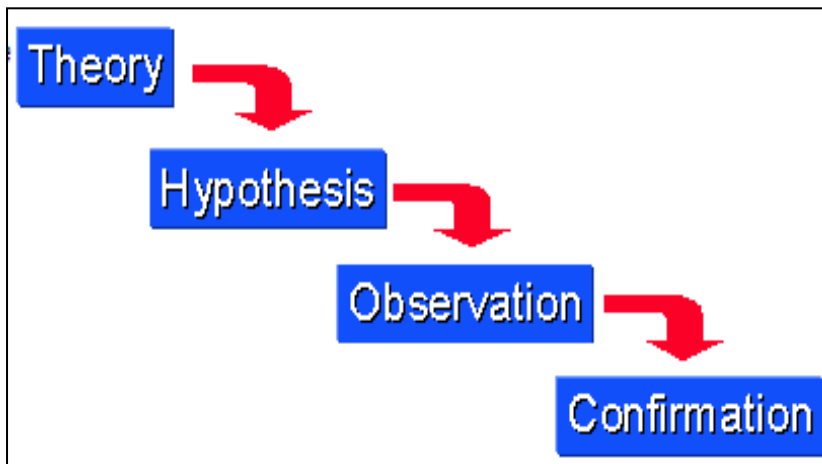
Inductive Reasoning

- In **inductive reasoning**, the research study begins with specific observations and measures, it detects patterns and regularities, formulates some tentative hypotheses (research questions/goals) that can be explored, and finally ends up **developing** some **general conclusions or theories**.

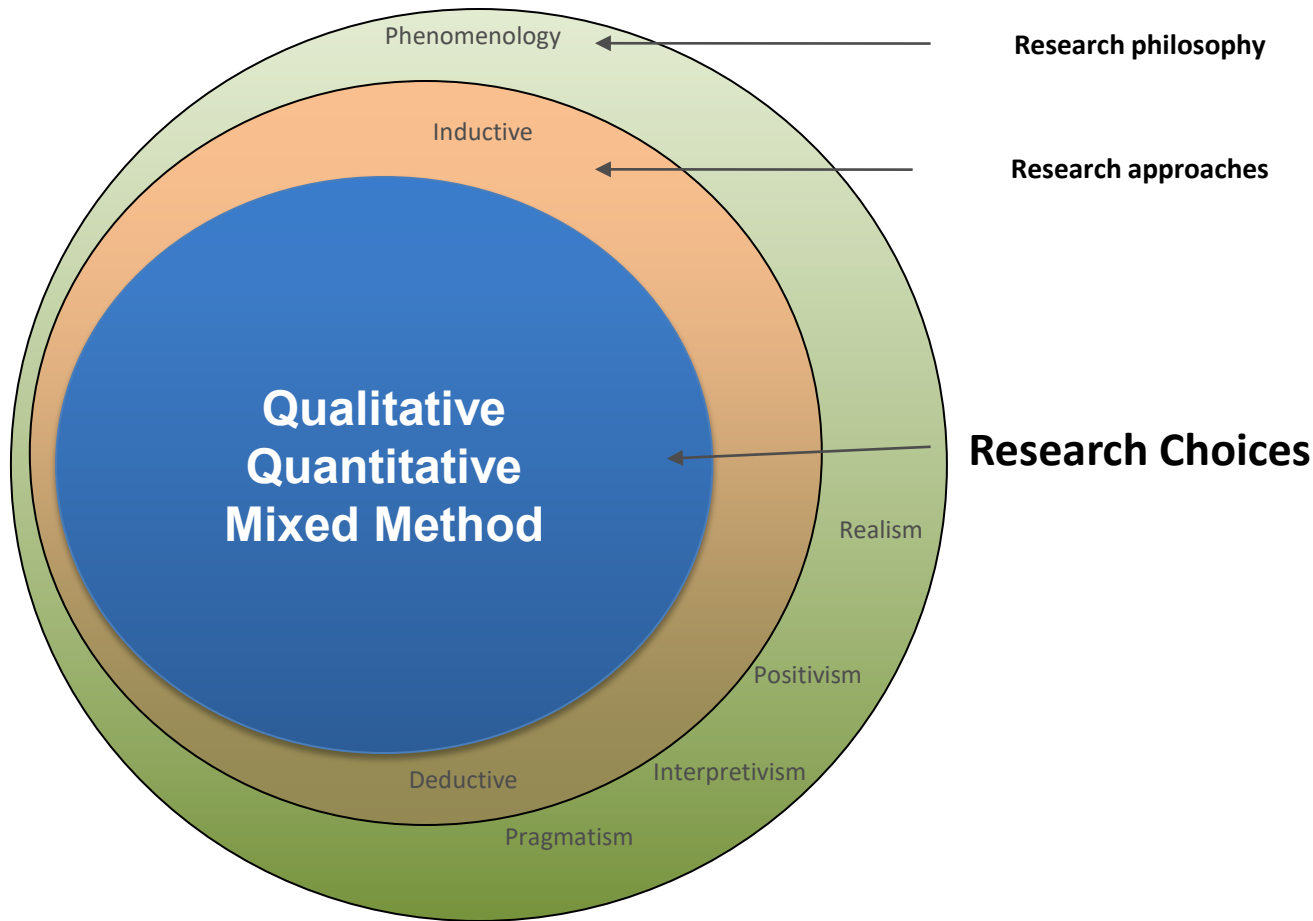


Deductive Reasoning

- **Deductive reasoning** is often referred to as a ‘top-down’ approach. The research study may begin with a *theory* about a topic of interest. It is then narrowed down into more specific *hypotheses* (*research questions/goals*) that can be **tested**. It is then narrowed down even further to collect *observations* to address the hypotheses. This ultimately leads to the test of the hypotheses with specific data - a **confirmation** (or not) of the original theories.



The Research Onion – Research strategies

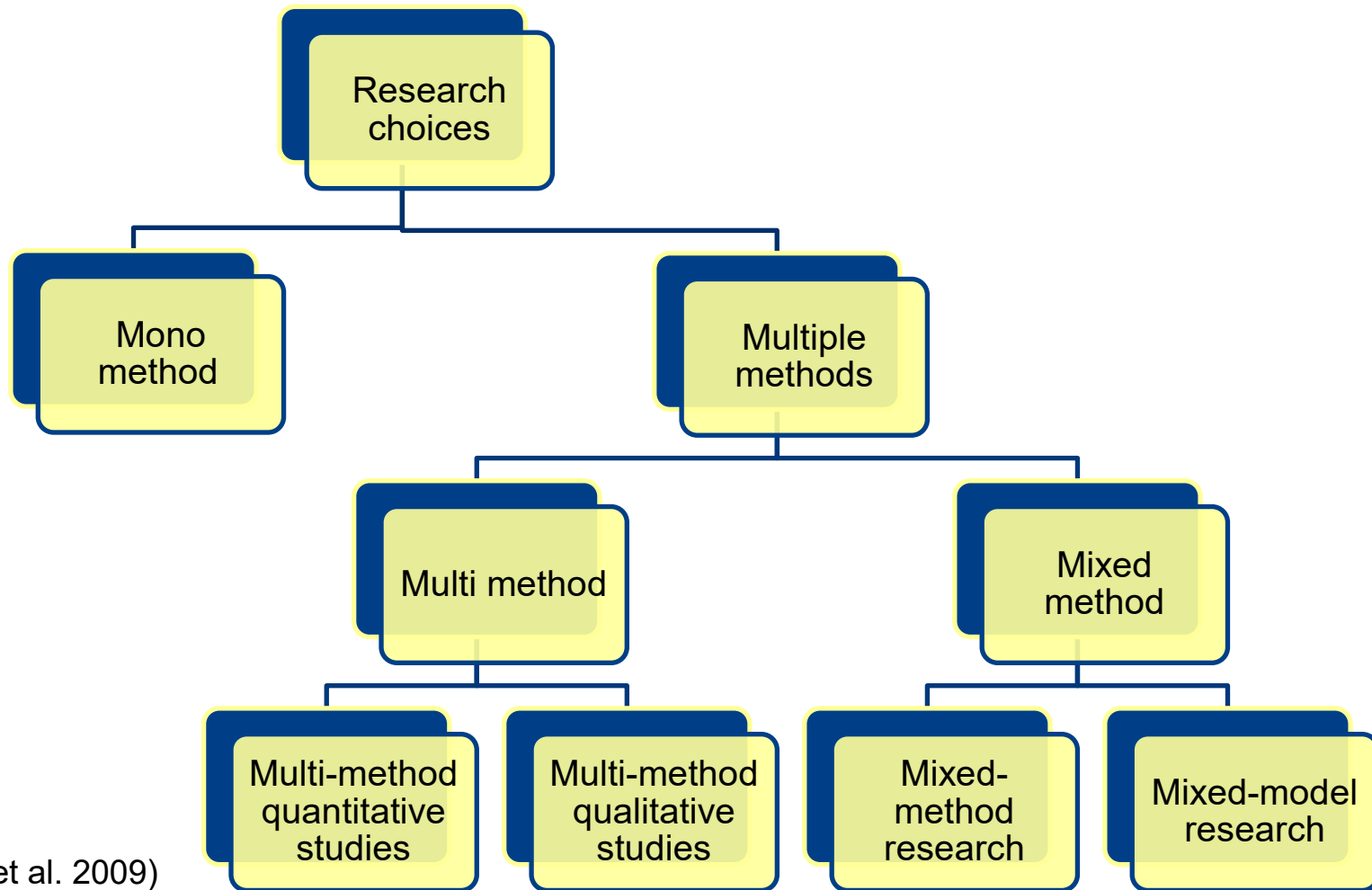


Quantitative vs. Qualitative

- **Quantitative research:**
 - ◆ focuses on verifying hypotheses (deductive) or finding patterns (inductive) using typically *large amounts of data*
- **Qualitative research:**
 - ◆ focuses on understanding the important characteristics of typically *small samples of data*
- **Example:** investigate users' response to an interface
 - ◆ quantitative approach: collect ratings, verify user acceptance, sensor data, test results,
 - ◆ qualitative approach: understand *why* users interact with the interface in certain ways

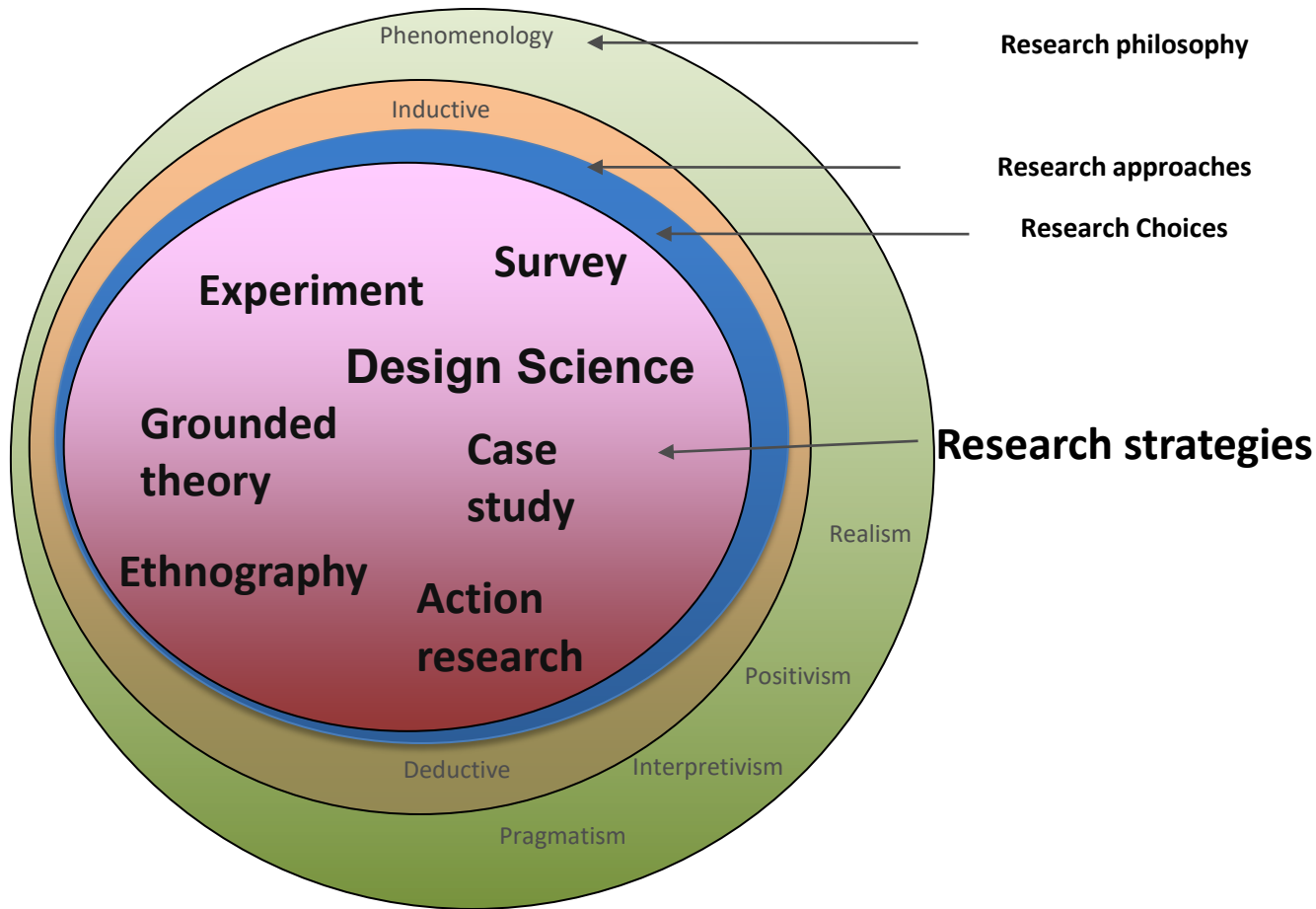
Research Choices

Both qualitative and quantitative methods may be used appropriately with any research paradigm and they can be combined



(Saunders et al. 2009)

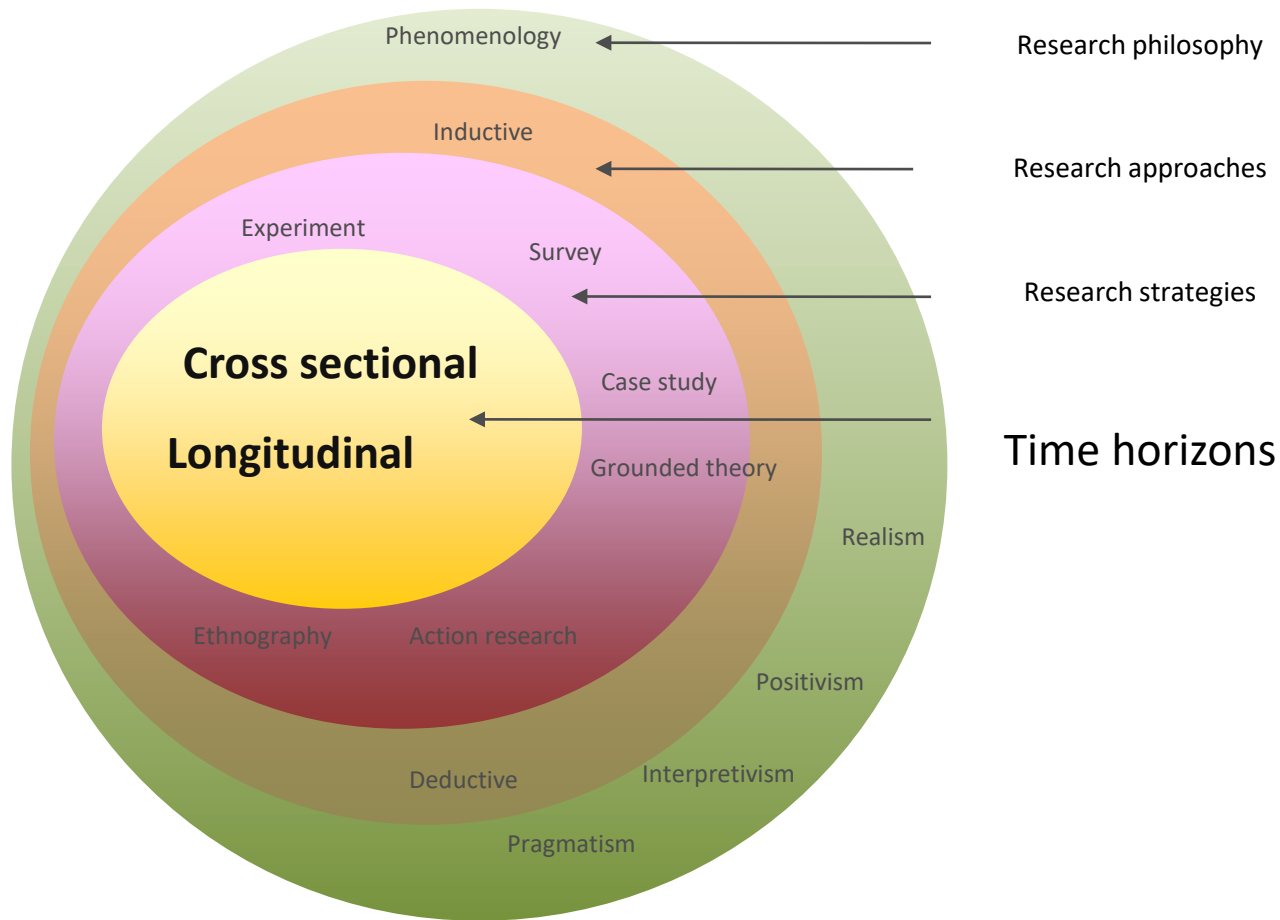
The Research Onion – Research strategies



Research Strategy

- A research strategy is a method of inquiry which moves from the underlying philosophical assumptions to research design and data collection.
- The choice of research method influences the way in which the researcher collects data [Meyers, 2004]. Specific research methods also imply different skills, assumptions and research practices.

The Research Onion – Time Horizons



Time Horizons

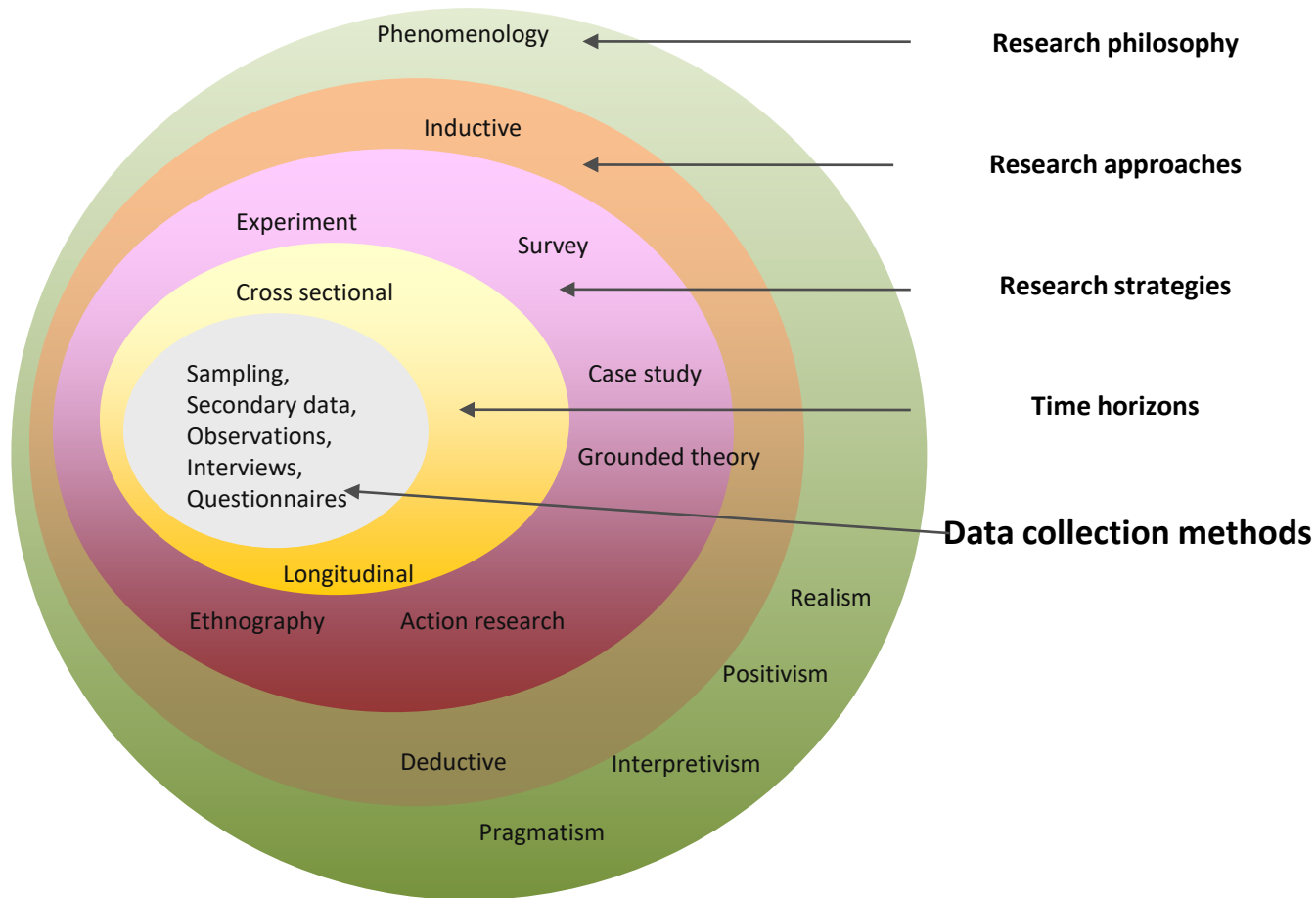
□ Cross-sectional studies

- Snapshot of constructs at a single point in time
- Data is collected just one time it could be over a period of days, weeks, or months in order to answer a research question.
- Use of representative sample

□ Longitudinal studies

- Constructs measured at multiple points in time
 - Eg. The researcher might want to study employees' behaviour before and after a change in the top management.

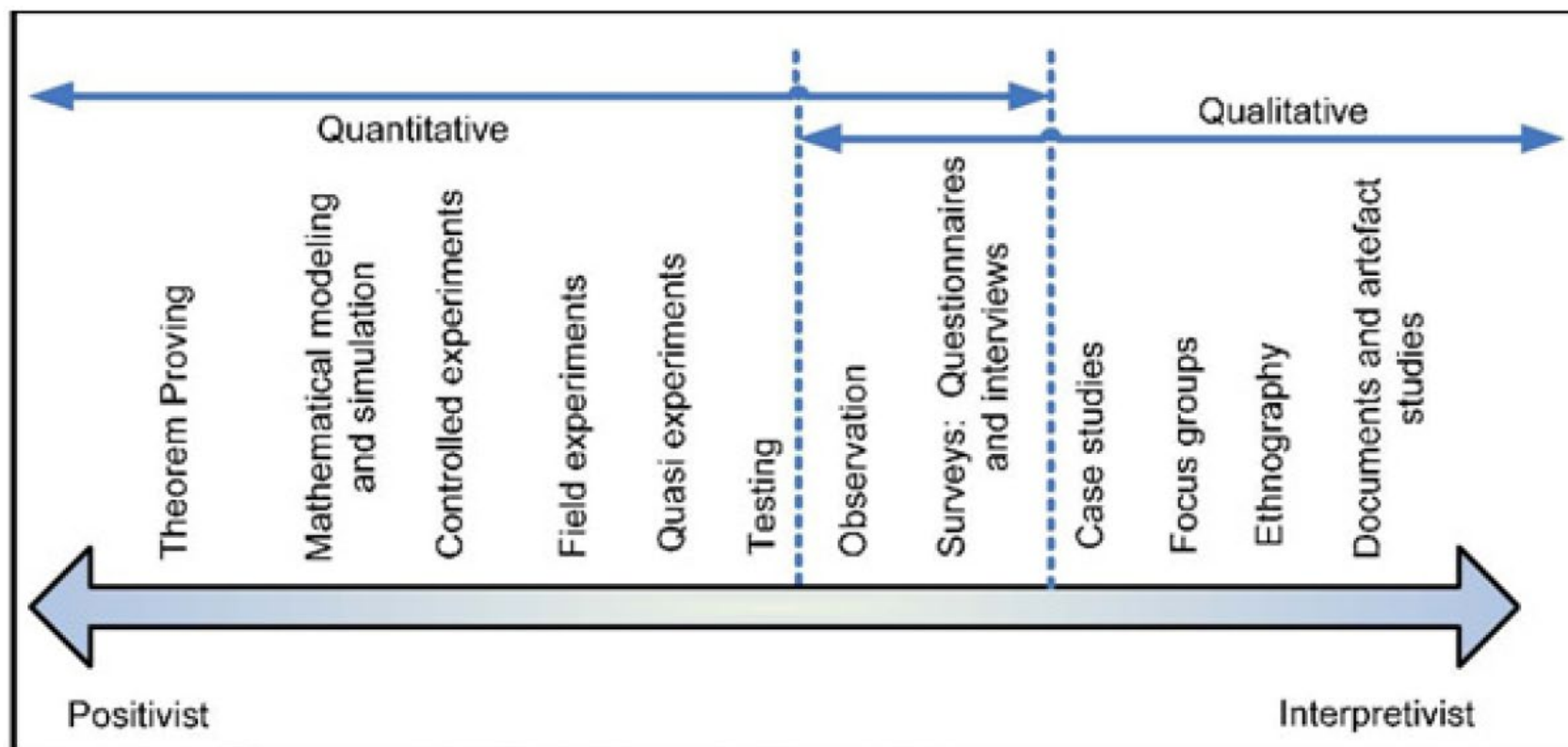
The Research Onion – Data Collection



Data Collection

- **Data collection** is the process of **gathering** and measuring information on targeted variables in an established systematic fashion, which then enables one to answer relevant questions and evaluate outcomes.

Data Collection, Choices and Philosophy



(De Villiers 2005)