



# Introduction to Quantitative Research

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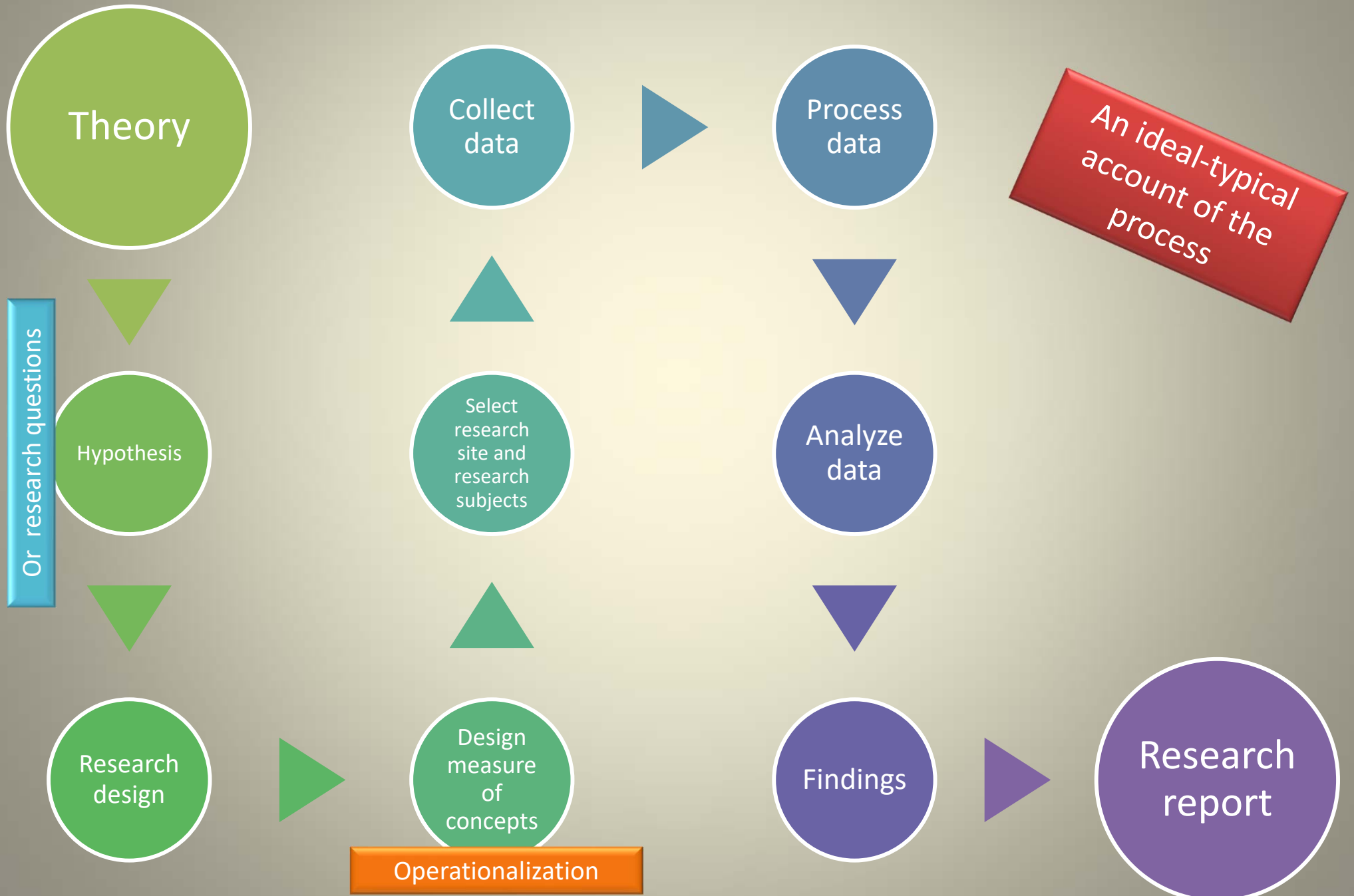
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# Quantitative research process



# Course outline

1. Introduction to Quantitative research strategy: Epistemological and ontological considerations, quantitative research process and research designs
2. Research questions and hypotheses, Sampling, Questionnaire
3. Introduction to SPSS: Data entry, defining variables, recoding, and computing variables
4. SPSS: Data analysis (Frequencies, measures of central tendency, measures of variability, charts)
5. SPSS: Data analysis (Chi-square, T-test, ANOVA, Correlation)
6. Writing up quantitative research: Research reports and dissertations

# *Today we will be discussing...*

- Research strategies differences
  - Deductive and inductive theory
- Epistemological considerations
  - Positivism
  - Interpretivism
- Ontological considerations
  - Objectivism
  - Constructionism
- Quantitative research process
- Research designs

# Research strategies differences

## Fundamental differences between quantitative and qualitative research strategies

	<b>Quantitative</b>	<b>Qualitative</b>
Theory and research	Deductive Testing the theory	Inductive Generation of theory
Epistemological orientation	Natural science model Positivism	Interpretivism
Ontological orientation	Objectivism	Constructionism
Data collection	Numerical data Measures	Text, narratives, textual representations of images, observations, etc.

*Mixed Methods: Combining qualitative and quantitative research designs and methods*

# Theory and research

- What is theory?

*“its most common meaning is as an explanation of observed regularities” (Bryman, 2012, p.21)*

- What type of theory?

## Grand theories

High level of abstraction

They offer few indications to research designs

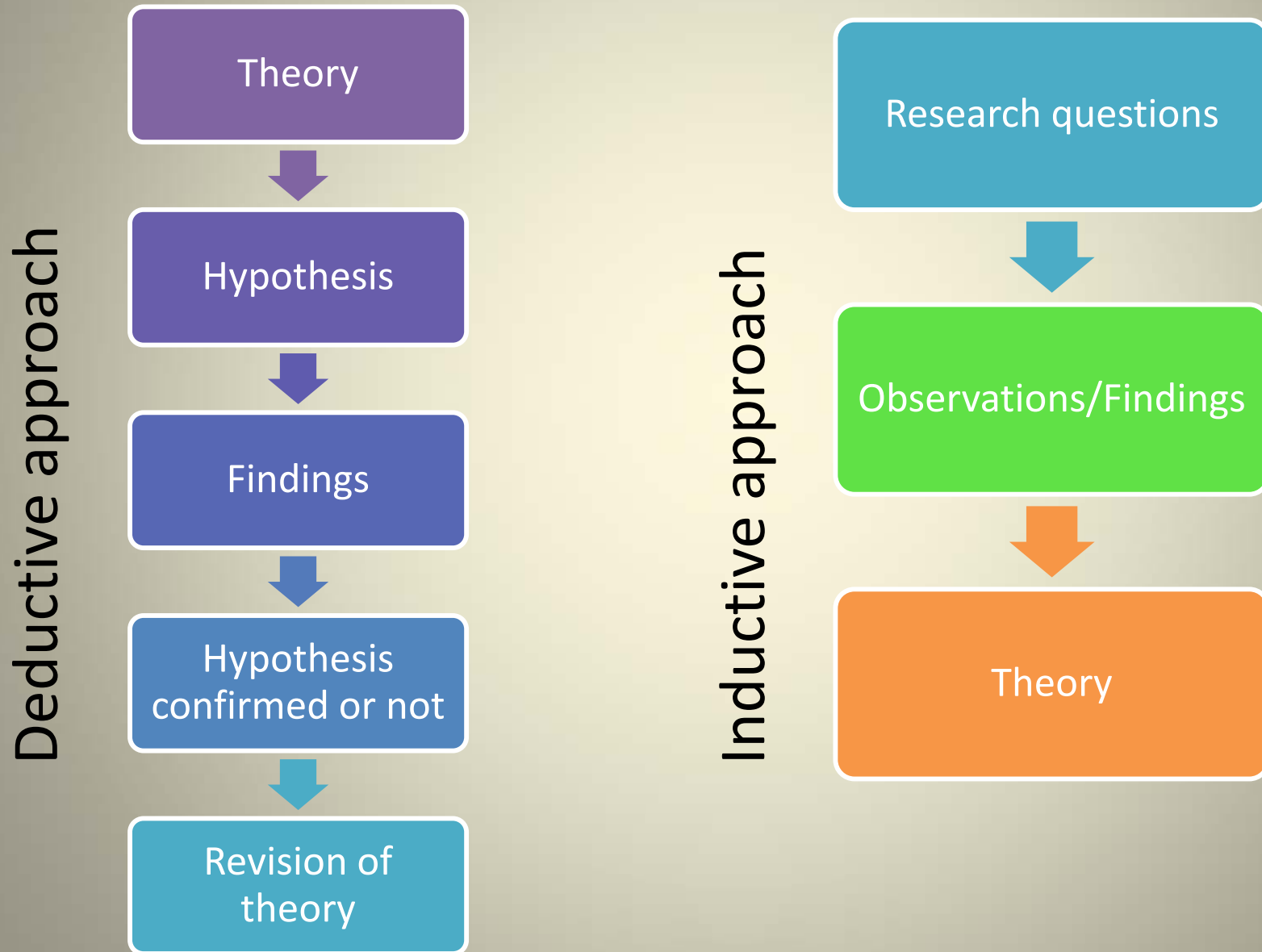
## Middle range theories

Offer more indications applicable to research designs

They facilitate the formation of hypotheses which they can be empirically investigated

Merton (1967)

# Deductive and inductive theory



# Epistemological considerations

An *epistemological issue* refers to the question of what is (or should be) regarded as acceptable knowledge in a discipline.

**Positivism:** the social world can and should be studied according to the same principles, procedures and ethos as the natural sciences.

**Interpretivism:** Research should respect the differences between people and scientists should try to understand the subjective meaning of social action.

Only phenomena and hence knowledge confirmed by the senses can genuinely be justified as knowledge (the principle of *phenomenalism*).

The purpose of theory is to generate hypotheses that can be tested and that will thereby allow explanations of laws to be assessed (the principle of *deductivism*).

Knowledge is reached through the gathering of facts that provide the basis for laws (the principle of *inductivism*).

Science must and can be conducted in a way that is value free (*objective*).

The research subjects of social sciences are fundamentally different from that of the natural sciences. Therefore a different logic procedure is needed.

*Hermeneutics:* the interpretation of human action through empathic understanding.



# Ontological considerations

*Ontology* refers to the nature of social entities

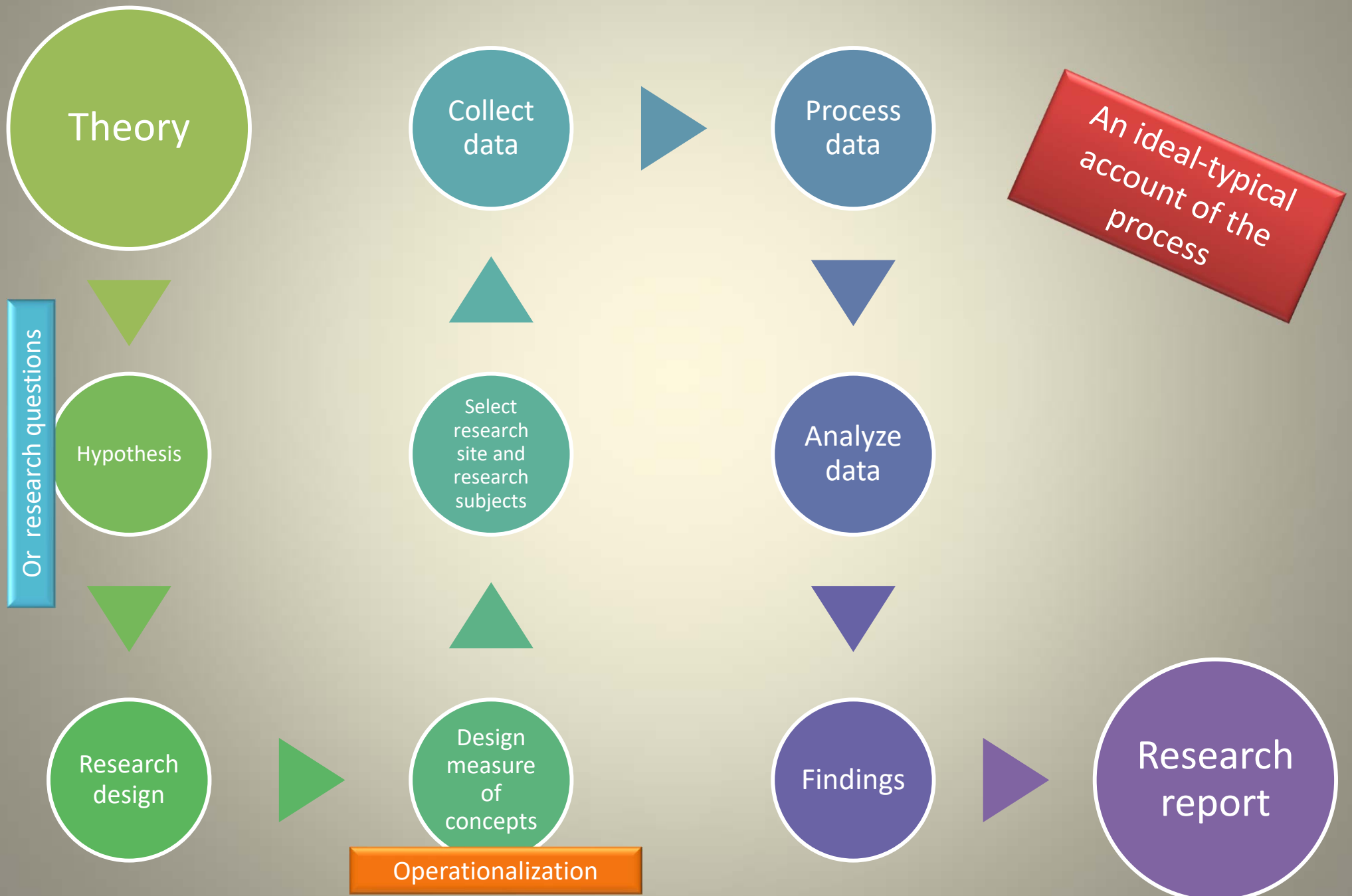
**Objectivism:** *social phenomena are external facts beyond our reach or influence. Their meaning is independent of social action.*

The phenomena have an almost tangible reality external to the subjects.

**Constructionism:** Individuals have an active role in the social construction of reality.

The categories people employ in understanding the world are social products. They are constructed through interaction.

# Quantitative research process



# Research designs

Provide a framework for the collection and analysis of data. Choosing a research design is highly associated with the priority given to one of the following research aims:

1. Expressing causal connections between variables
2. Generalizing to larger groups of individuals than those included in the sample
3. Understanding behavior and the meaning of that behavior in its social context
4. Having a temporal appreciation of social phenomena and their interconnections

**Types of research design:**

- **EXPERIMENTAL DESIGN**
- **CROSS-SECTIONAL DESIGN (OR SURVEY)**
- **LONGITUDINAL DESIGN**
- **CASE STUDY DESIGN**
- **COMPARATIVE DESIGN**

# EXPERIMENTAL DESIGN

Experimental design explores causal (cause & effect) relationship between the variables.

- Laboratory experiment
  - Field experiment
- Quasi-experiment
  - Natural experiment

# Laboratory experiment

Not always conducted in a laboratory but they always comply with these rules:

Manipulation

Allocation of participants to experimental and control groups

Random assignment

# *Manipulation*

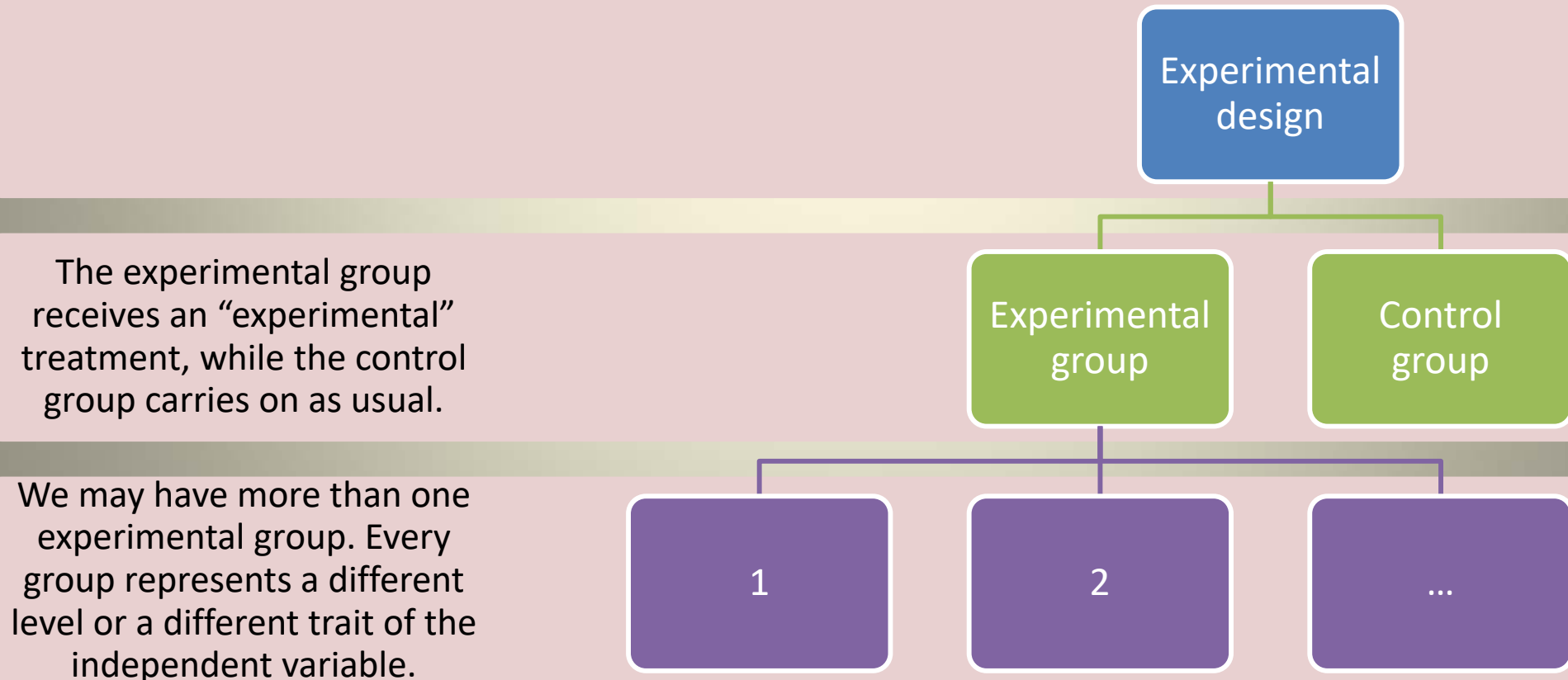
Is the process in which researchers **control** the independent variable in order to determine whether it does in fact have an influence on the dependent variable.

**Controlling the independent variable** means to have different types or levels of a trait or conditions.

However, a huge majority of variables of interest in social sciences cannot be manipulated (like gender, age or experiences).

# *Allocation to experimental and control groups*

Experimental subjects are allocated to one of two or more groups. The control group is a reference point for testing the manipulation and enables us to eliminate rival explanations of the findings.



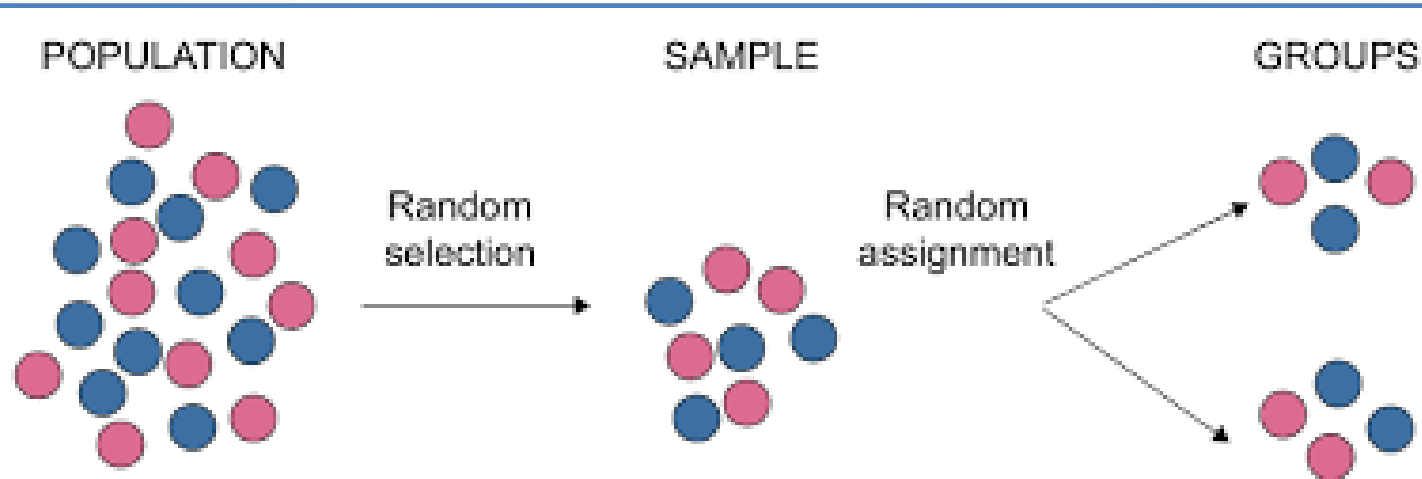
# Random assignment



All participants have the same chance to be in the experimental or the control group.

The groups do not differ in any other trait.

Enhance the confidence in the causal findings.





# Field experiment

Take place in real-life settings and it is more likely to be used in social sciences. Laboratory experiments and field experiments are called *real experiments*.

One of the most famous field experiments in social psychology is:

*The by-stander effect experiment*

<https://www.youtube.com/watch?v=OSsPfbup0ac>

In field experiments there is less control over extraneous variables that might bias the result.

# Quasi-experiment

Studies that have some of the characteristics of experimental design but do not fulfill all validity requirements.

## Manipulation

- Usually applied in the natural setting of an incident

## Random allocation to groups

- It is invariably not possible to randomly assign participants into groups. There is no control group as a reference point.

# Natural experiment

An observation study in which researchers have no control over the variables.

An important incident (natural disaster, political or financial reforms, etc) already takes place and is beyond the control of the researchers.

# CROSS-SECTIONAL DESIGN (OR SURVEY)

Entails the collection of data on more than one case and at a single point in time in order to collect a body of quantitative (or quantifiable) data in connection with two or more variables, which are then examined to detect patterns of association.

Cross-sectional design is interested in variation. Variation can be established when more than one case is being examined.

Data on the variables of interest are collected simultaneously. No period of time intervenes between the stages of the data collection.

In order to establish variation between cases and to examine association between variables, we need a systematic and standardized method for estimating variation.

Detected through the examination of the relationships between the variables.

Cross-sectional designs denote a relationship between the variables but not a causal relationship (cause & effect).

Research methods associated with cross-sectional design is:

- questionnaires
- structured interview
- structured observation
- content analysis
- official statistics and records
- diaries

# LONGITUDINAL DESIGN

*When a sample is surveyed **on more than one occasion over time**, sometimes several years.*

For example, studying the cognitive development of the same children from birth till school years.

When the focus of data collection is the same group of people (usually a randomly selected sample) is called a *panel type design*.

When the focus of data collection is a group of people who share a certain trait (like being born in the same week, or being unemployed, etc.) is called *cohort study design*.

# CASE STUDY DESIGN

A detailed and intensive analysis of a single *case*.



The researcher is interested in clarifying the unique features of the case.

*A person, a group of people, an event, a community or an organization.*

## Critical case

- A case that allows a better understanding of the circumstances in which something occurs.

## Extreme or unique case

- A case that highlights the most unusual variation of a phenomenon. Not a typical or average case.

## Representative or typical case

- A case that exemplifies a broader category of which it is a member. Not extreme or unusual case but a case that is common or “classic”.

## Revelatory case

- An opportunity to observe and analyze a phenomenon previously inaccessible to scientific investigation.

# COMPARATIVE DESIGN

Entails studying two cases using more or less identical methods.

*Logic of comparison:* We can understand social phenomena better when comparing in relation two or more meaningfully cases of situations.

Cases: Organizations, nations, communities, etc.)



## Research strategy and research design

Research design	Research strategy	
	Quantitative	Qualitative
Experimental	<p><i>Typical form.</i> Most researchers using an experimental design employ quantitative comparisons between experimental and control groups with regard to the dependent variable.</p> <p><i>Examples.</i> Research in focus 3.2, 3.4.</p>	<p>No typical form. However, Bryman (1988a: 151–2) notes a study in which qualitative data on schoolchildren were collected within a quasi-experimental research design.</p>
Cross-sectional	<p><i>Typical form.</i> Survey research or structured observation on a sample at a single point in time. Content analysis on a sample of documents.</p> <p><i>Examples.</i> Research in focus 2.9, 3.8, 8.1, 8.4, 12.4, 13.2, 14.1.</p>	<p><i>Typical form.</i> Qualitative interviews or focus groups at a single point in time. Qualitative content analysis of a set of documents relating to a single period.</p> <p><i>Examples.</i> Research in focus 2.3, 2.9, 3.9, 20.4 (see also Table 1.1); Thinking deeply 3.3.</p>
Longitudinal	<p><i>Typical form.</i> Survey research on a sample on more than one occasion, as in panel and cohort studies. Content analysis of documents relating to different time periods.</p> <p><i>Examples.</i> Research in focus 3.10, 3.11, 3.13.</p>	<p><i>Typical form.</i> Ethnographic research over a long period, qualitative interviewing on more than one occasion, or qualitative content analysis of documents relating to different time periods.</p> <p>Such research warrants being dubbed longitudinal when there is a concern to map change.</p> <p><i>Examples.</i> Research in focus 3.12, 17.4.</p>
Case study	<p><i>Typical form.</i> Survey research on a single case with a view to revealing important features about its nature.</p> <p><i>Examples.</i> The choice by Goldthorpe et al. (1968) of Luton as a site for testing the thesis of <i>embourgeoisement</i>; the study by Westergaard et al. (1989) of the effects of redundancy at a Sheffield steel plant (Research in focus 7.2).</p>	<p><i>Typical form.</i> The intensive study by ethnography or qualitative interviewing of a single case, which may be an organization, life, family, or community.</p> <p><i>Examples.</i> Research in focus 2.6, 3.14, 19.1, 20.4.</p>
Comparative	<p><i>Typical form.</i> Survey research in which there is a direct comparison between two or more cases, as in cross-cultural research.</p> <p><i>Examples.</i> Research in focus 2.4; Gallie (1978).</p>	<p><i>Typical form.</i> Ethnographic or qualitative interview research on two or more cases.</p> <p><i>Examples.</i> Research in focus 3.17, 3.18, 17.3.</p>