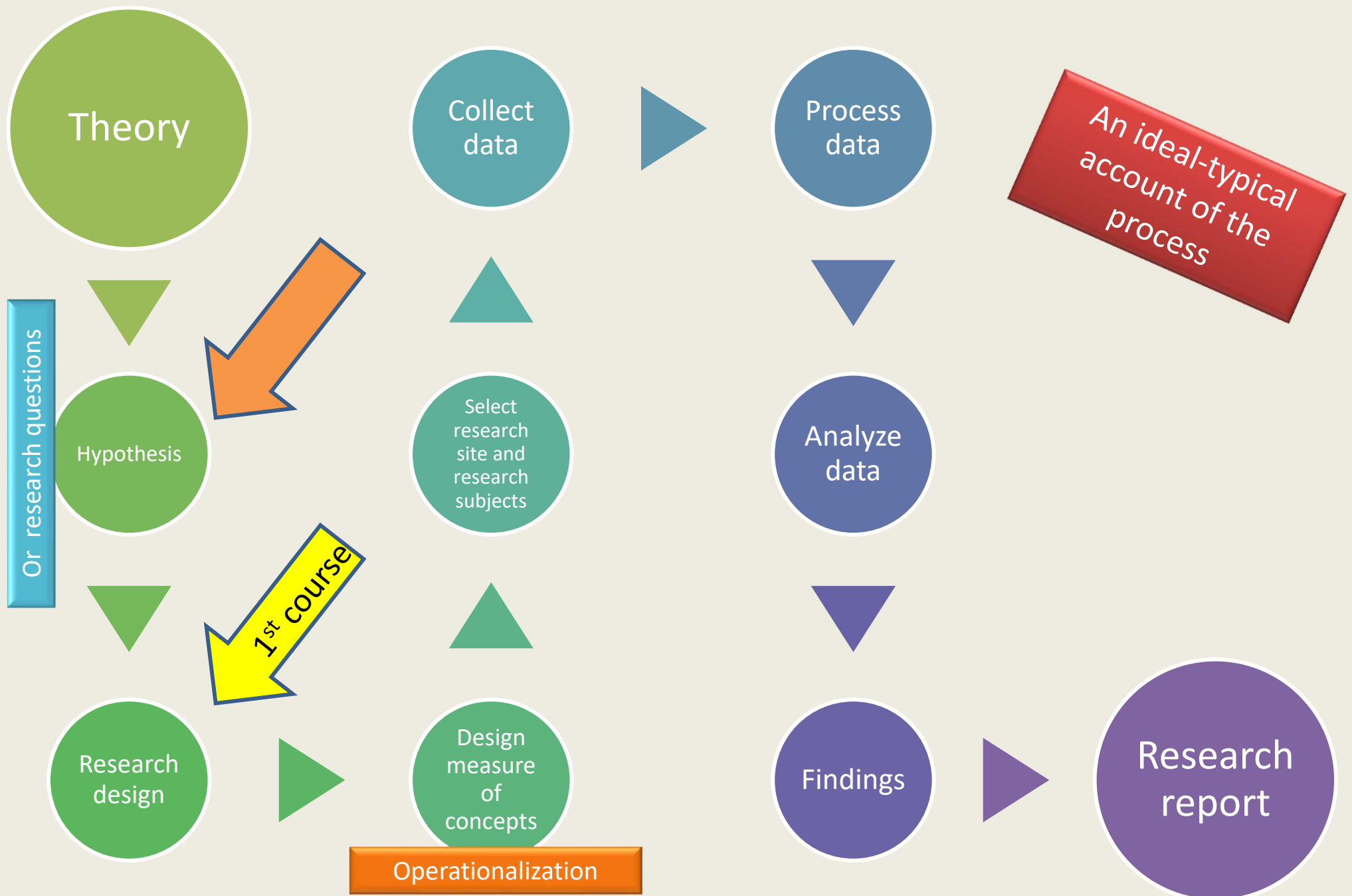


**Quantitative Research:  
Research questions and hypotheses,  
Sampling, Questionnaire**

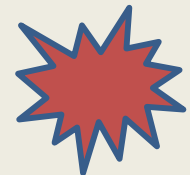
# Quantitative research process



# The importance of research questions and hypotheses

- ✓ They provide guidance in the processing and analyzing of data and the interpretation of the findings.
- ✓ An open-ended research without specific research questions entails a great risk of confusion during the data collection or writing up research.

When formulating a research question or a hypothesis the important question is *“What do I want to find?”*



- What is a research problem?

An interrogative sentence that states the relationship between two variables.

*Example: Can a group induce a person to deliver punishment of increasing severity to a protesting individual? (Milgram, 1964).*

Group pressure

Person's behavior

Criteria of good research problems (Kerlinger, 1973):

1. The variables in the problem should express a relationship.
2. The problem should be stated in question form.
3. The problem statement should be such as to imply possibilities of empirical testing.

- What is a research question?

A specific statement on an aspect of the research problem, that helps the researcher to make decisions on sampling, data collection and analysis.

*Example: Does group pressure have an impact on a person's behavior regarding punitive/aggressive actions?*

Let's think...



Can we derive information about the participants or the means of collecting data from the example?



**Probably no...**

*Example: What are the main opinions of parents regarding group pressure and its impact on adolescents' aggressive behavior?*

The degree of specificity required is dependent on the purpose of the problem statement.

## Sources of research questions:

- The existing literature: Unsolved or contradictory issues
- New methods and theories
- New social trends and technological developments
- Social problems & Practical issues
- Replication of previous research
- Personal experience/interests
- Funding

- What is a research hypothesis?

Hypothesis is a prediction of the relationship between two variables. The hypothesis must be stated in such a way that it can either be confirmed or refuted.

*Example: Group pressure increases the severity of punishment that participants will administer (Milgram, 1964).*

**Null hypothesis:**

A statement of no relationship among the investigated variables.

A null hypothesis is used in statistical analysis.

*Example: Group pressure has no impact on the severity of punishment that participants will administer.*

In statistical terms the research hypothesis is called **alternative hypothesis**.

## Research questions

- Usually precede hypothesis' formulation.
- They apply both in quantitative and qualitative research.

## Hypothesis

- Derived from knowledge obtained from the literature review and previously conducted research.
- When the research hypothesis is confirmed, the null hypothesis is rejected.
- The confirmation of a hypothesis is based on statistical hypothesis testing procedures.



# Criteria for evaluating research questions

## Research questions should:

Be clear and comprehensible

Be neither too narrow nor too broad

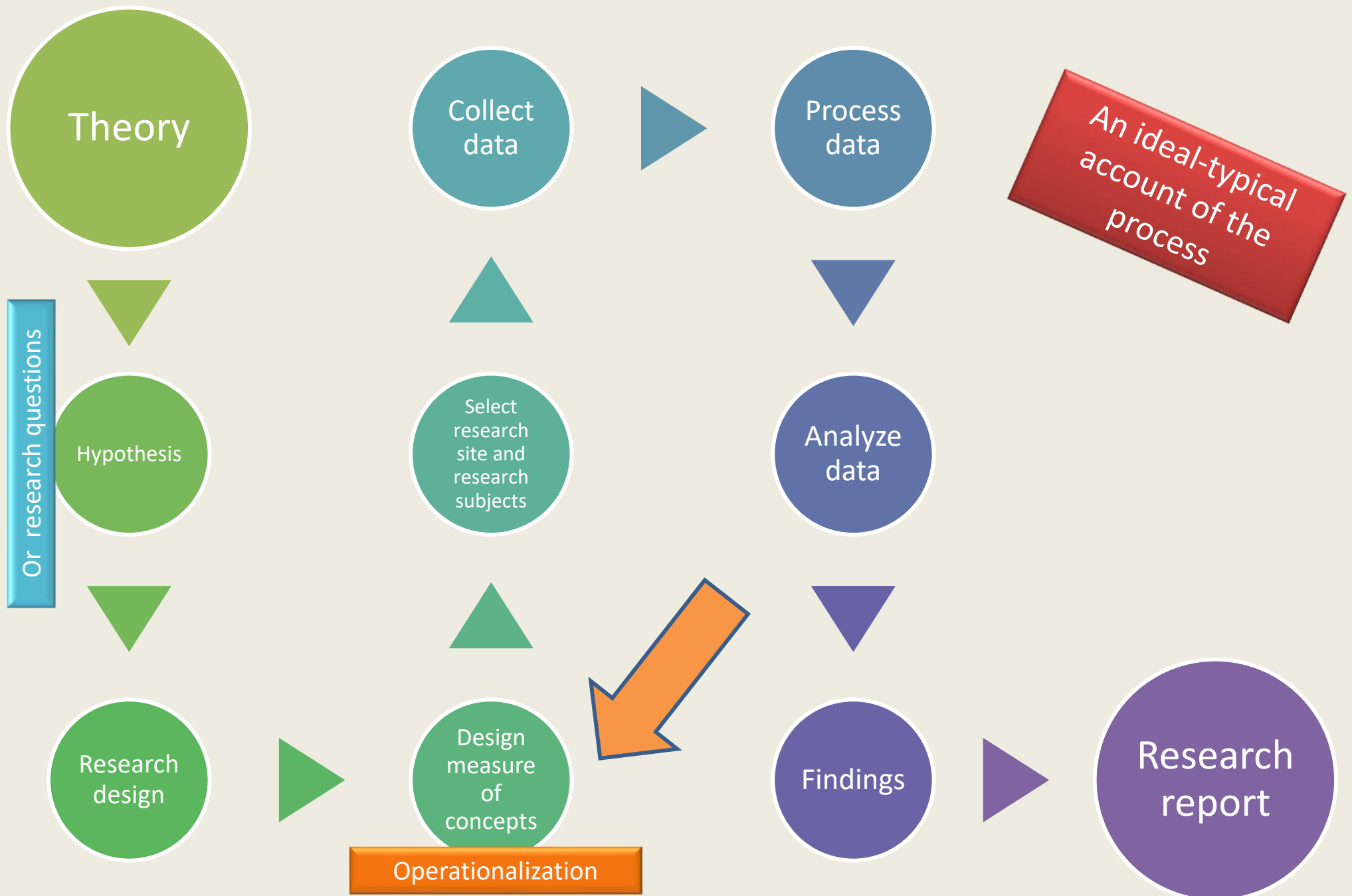
Have some connection with established theory and previously conducted research. This connection has to be obvious.

Be linked to each other as they are parts of a argument

Reveal the contribution of the current study to the topic or field

Be justified, meaning how they came up and why they are important

# Quantitative research process



# Operationalization

Is the process of identifying indicators to accurately measure a concept.



Measurements allow researchers to accurately describe differences between people by means of consistent instruments .



Labels we give to elements of the social world in order to organize and explain ideas and observations.



Stand for a concept and are employed as a measure for that concept.

*Operational definition:* a statement of procedures the researcher is going to use in order to measure a specific concept.

# Let's operationally define...

Depression



- Hopelessness/Negative thoughts
- Irritability
- Feelings of guilt
- Fatigue/weight lost/lack of interest in sex

Beck Depression  
Inventory

Aggression



- Throwing objects
- Kicking/hitting/biting
- Shouting/ foul language (verbal aggression)
- Feelings of fear, anger, stress, etc.

Academic  
performance



- Grade point average

# Why we need operational definitions?

## *Validity*

Construct validity (or measurement validity) is concerned with the extent to which operationalization accurately represents the concept it describes.

## *Replicability*

Research should be designed so it can be replicated by other researchers. Replicability validates the findings of previous research and offers grounds for establishing theories.

## *Generalizability*

Operational definitions allow generalization to the whole population (population validity), to different settings than the one in the current study (ecological validity), or across time (temporal validity).

## *Dissemination*

Operational definitions allow application of new knowledge to the field.