

# Research Design

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## Research Design

- There is no ONE research design
- It all depends on your:
  - Purpose
  - Research Question
  - Resources
  - Audience/material to be researched
  - Other...

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## Research Design: Main Steps

- Nature of the study
- Research Question
- Do your homework (literature review)
- What is your time table/budget?
- Define the concepts, variables and their measurement levels.
- **Now what?**

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## Research Design: Main Steps

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## Research Design: Nature of Study

- Things to think about:
  - Theoretical vs. Situational Design
  - Feasibility
  - Efficiency
  - Timeline

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## Research Design: Nature of Study

- Cross-sectional vs. Longitudinal study
  - Cross-sectional:
    - one time
  - Longitudinal:
    - Trend: Different people
    - Panel: same people
    - Cohort: common characteristics

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## Research Question

- **Three basic types:**
  - **Descriptive**
  - **Relational**
  - **Causal**

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## Research Question

- **Descriptive:**
  - Finds out what is going on
  - We are interested in describing a phenomenon
  
  - Example:
    - How will Americans vote in 2006?
    - How did the Washington Post cover the Hezbollah-Israeli war of summer 2006?

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## Research Question

### □ **Relational:**

- Examines the relationship between two or more variables or concepts.
- What happens to one of the variables when the other variable changes
  
- Example:
  - What is the relation between gender and voting behavior?
    - We are comparing gender (C1) to voting behavior (C2).
  - What is the relationship between the country of the newspaper (C1) and its coverage (C2) of the Hezbollah-Israel war of summer 2006?

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## Research Question

### □ **Causal:**

- Know if one variable affects or causes a change or a certain outcome in another variable.
- Mostly in EXPERIMENTS!
  
- Example:
  - Does political advertising cause major changes in voter preference?
  - Did the foreign policy of a country affect the way its newspapers covered the Hezbollah-Israel war of summer 2006?

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## Understanding Relationships

- A relationship refers to the correspondence between two variables.
  
- There are several types of relationships and can be viewed in two ways:
  - The nature of the relationship
  - The direction of the relationship
  - The pattern of the relationship

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## Understanding Relationship: Nature

- **Correlation (covariation)**
  - Two or more variables perform in a certain synchronized manner.
  - This is a probability relationship.
  - Example:
    - The more you drink, the more cool you think you are.
    - The more you drink, the less cool she thinks your are.
- **Causation**
  - Causation: one variable caused a change in the other.
  - Hard to test; mostly experiments.
  - Example:
    - Drinking causes liver disease

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## Understanding Relationships: Direction

- **Positive**
- **Negative**
- **No relationship**

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## Understanding Relationships: Direction

- **Positive**
  - HIGH values in one variable are associated with HIGH values in the other,
  - Or LOW values in one variable are associated with LOW values in the other variable(s).
  - Example:
    - The more you drink, the more cool you think you are.
    - The less you drink, the less cool you thinks your are.

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## Understanding Relationships: Direction

- **Negative**
  - HIGH values in one variable are associated with LOW values in the other,
  - Or LOW values in one variable are associated with HIGH values in the other variable(s).
  - **Example**
    - The more you drink, the less cool she thinks your are.
    - The less you drink, the more cool he thinks your are.

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## Understanding Relationships: Direction

- **No Relationship:**
  - Knowing the value of one variable doesn't tell us anything about the other.
  - **Example:**
    - There is no relationship between drinking and love.

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## Understanding Relationships: Pattern

- **Linear:**
  - Straight line.
- **Non-linear:**
  - Not a straight line
- **Other:**
  - Example: curvilinear
  - The relationship changes direction at certain points.

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### Research Design: Main Steps

- Nature of the study
- Research Question (theory, hypotheses...)
- **Do your homework (literature review)**
- **What is your time table/budget?**
- Define the concepts, variables and their measurement levels.
- **Now what?**

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### Research Design: Your Homework!

- Literature Review & Background Search (ex: p.40)
  - Main theories related to this topic
  - What others have found on this topic
    - Major agreements
    - Major disagreements
  - What has not been done (gap in literature)
  - Also:
    - Justifying different aspects of the study
    - Conceptualization (theoretical and operational)
    - Methodology and instrument

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### Research Design: Main Steps

- Nature of the study
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## Research Design: Concepts/Variables

### □ Defining Concepts and Variables

- A label
- A theoretical definition
- An operational definition
  
- RQ: Does media literacy improve women's self-confidence?
  - Concepts:
    - C1: media literacy
    - C2: women's confidence
  - Relationship: improve (cause to improve = causal RQ)

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## Research Design: Concepts/Variables

### □ Defining Concepts and Variables

- A label:
  - "media literacy"
  
- A theoretical definition:
  - "The extent to which a person can access, analyze and utilize information..."
  
- An operational definition (measurement):
  - "Measured by a current affairs test (V1) and a Computer literacy test (V2)..."

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## Research Design: Concepts/Variables

### □ Defining Variables:

- After defining concepts (operationally), define variables and measures:
- Independent and dependent variables
  
- Example: Media Literacy measured by a current affairs test (V1) and a Computer literacy test (V2)
  - How will we measure the V1 and V2?
    - On a scale of 0-100? Scale of A-F? Pass/Fail?

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## Levels of Measurement

### ▣ Levels/Scales of measurement:

- Four levels also called "scales" (Fig 3.5, p.47.)
  - ▣ **Nominal** (least precision/least information)
  - ▣ **Ordinal**
  - ▣ **Interval**
  - ▣ **Ratio** (most precision/most information)
- Depends on your Research Question
- Depends on your Concept Definition

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## Levels of Measurement

### ▣ **Nominal: Name only; a simple categorization**

- Assigning items to groups or categories.
- No ordering
- Qualitative rather than quantitative.
- Often referred to as categorical or qualitative variables.
- Ex: Gender, race, country of birth...

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## Levels of Measurement

### ▣ **Ordinal: Name with Ranking**

- Ordered in a way that higher numbers represent higher values. Larger than, Smaller than...
- Intervals between the numbers are not necessarily equal.
- Ex: A class line-up from taller to shorter.
  - ▣ We don't know how tall each person is or what the difference in height between two people is.

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## Levels of Measurement

### Interval: Name with equal ranking and arbitrary zero point

- Same as Ordinal but with equal "distance" between values
- Has no "real" zero. Zero is arbitrarily chosen.
- CAN add and subtract. Can NOT multiply or divide.
- Can NOT say double, triple, half, etc...
- Example: Thermometer scale (Fahrenheit)
  - The difference between 80 and 85 is the same as the difference between 40 and 45, but a temperature of 30 is not twice as warm as 15.



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## Levels of Measurement

### Ratio: name with equal ranking plus a "true" zero

- Same as Interval but with "real" zero
- True Zero: I make \$0 per year...
- We CAN add, subtract, multiply, or divide
- CAN say double, triple, half, etc...
- Highest precision.
- Example: weight, salary, test score...

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## Levels of Measurement

### Quick tool:

- Does the variable have ranking?
  - No: **NOMINAL**
  - Yes: next question:
- Is there 'equal' ranking?
  - No: **ORDINAL**
  - Yes: next question:
- Is there a 'true zero'?
  - No: **INTERVAL**
  - Yes: **RATIO**

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## Levels of Measurement

- You can sometimes change a variable's scale
  - RULE: you can go "up" scale but not "down."
  - Can go from the most precise to least but NOT the opposite.

Wrong: Nominal → ordinal → interval → ratio

Correct: Ratio → interval → ordinal → nominal

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## Levels of Measurement

- Levels are not always clear cut
- What level would 'year at college' be?
  - Nominal
  - Ordinal
  - Interval
  - Ratio
- It depends on your research question and how you are trying to measure the concept.

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## Research Design

- We chose the nature of the research.
- We defined the problem (RQ...)
- We did our homework (literature review)
- We have a time table/budget
- We defined the concepts, variables and their measurement levels
- **Now what?**

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## Methodology

- What systematic method(s) to use?
  - Survey (W2,3)
  - Content Analysis (W4,5)
  - Experiment (W12)
  - Focus Group (W11)
  - In-depth Interview (W11)
  - Case study
  - Other...

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## Other steps in Research Design

- Determine the population to survey.
  - WEEK 2
- Establish budget and timetable.
- Who will conduct the study? Train them.
  - WEEK 3

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## Exercise 1: Research Design

- Theory
- Research Question
- Hypothesis
- Concepts
- Variables



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### Exercise example

- Theory: Education is Key to Success
- RQ1(Caus): Does success in college affect future income?
- RQ2(Corr): Is there a relationship between success in college and future income?
- RQ3(Disc): What do College Graduates make on average?

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### Exercise example

- RQ1(Caus): Does success in college affect future income?
- Hypothesis: The more successful a person is in college, the higher that person's future income

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### Exercise example

- Hypothesis: The more successful a person is in college, the higher that person's future income
- Concept 1: "success in college"
- Concept 2: "future income"

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## Exercise example

- **Concept 1: "success in college"**
- **Concept definition:**
  - **Label:** success in college
  - **Theoretical Definition:** the level of success an undergraduate student has achieved in an average U.S. university.
  - **Operational Definition:** the level of success is measured by the standardized GPA system
- **Variable:** V1 = GPA

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## Exercise example

- **Concept 2: "future income"**
- **Concept definition:**
  - **Label:** future income
  - **Theoretical Definition:** the annual income a person makes 5 years after receiving his/her undergraduate degree.
  - **Operational Definition:** the annual income measured in U.S. dollars
- **Variable:** V2 = salary in U.S. dollars

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## Exercise example

- **Theory:** Education is Key to Success
- **RO1(Caus):** Does success in college affect future income?
- **RO2(Corr):** Is there a relationship between success in college and future income?
- **RO3(Disc):** What do College Graduates make on average?
- **Hypothesis:** The more successful a person is in college, the higher that person's future income
- **Concept 1:**
  - **Label:** success in college
  - **Theoretical Definition:** the level of success an undergraduate student has achieved in an average U.S. university.
  - **Operational Definition:** the level of success is measured by the standardized GPA system
  - **Variable:** V1 = GPA
- **Concept 2:**
  - **Label:** future income
  - **Theoretical Definition:** the annual income a person makes 5 years after receiving his/her undergraduate degree.
  - **Operational Definition:** the annual income measured in U.S. dollars
  - **Variable:** V2 = salary in U.S. dollars

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## Final Project and Groups

- ▣ Project Description
- ▣ Groups



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