Experiments

GLCb1008 Introduction to Methodology of Social Sciences

Aim of this lecture

- Logic of experiments
- Experimental designs
- Strengths and weaknesses of experiments
- Practical issues

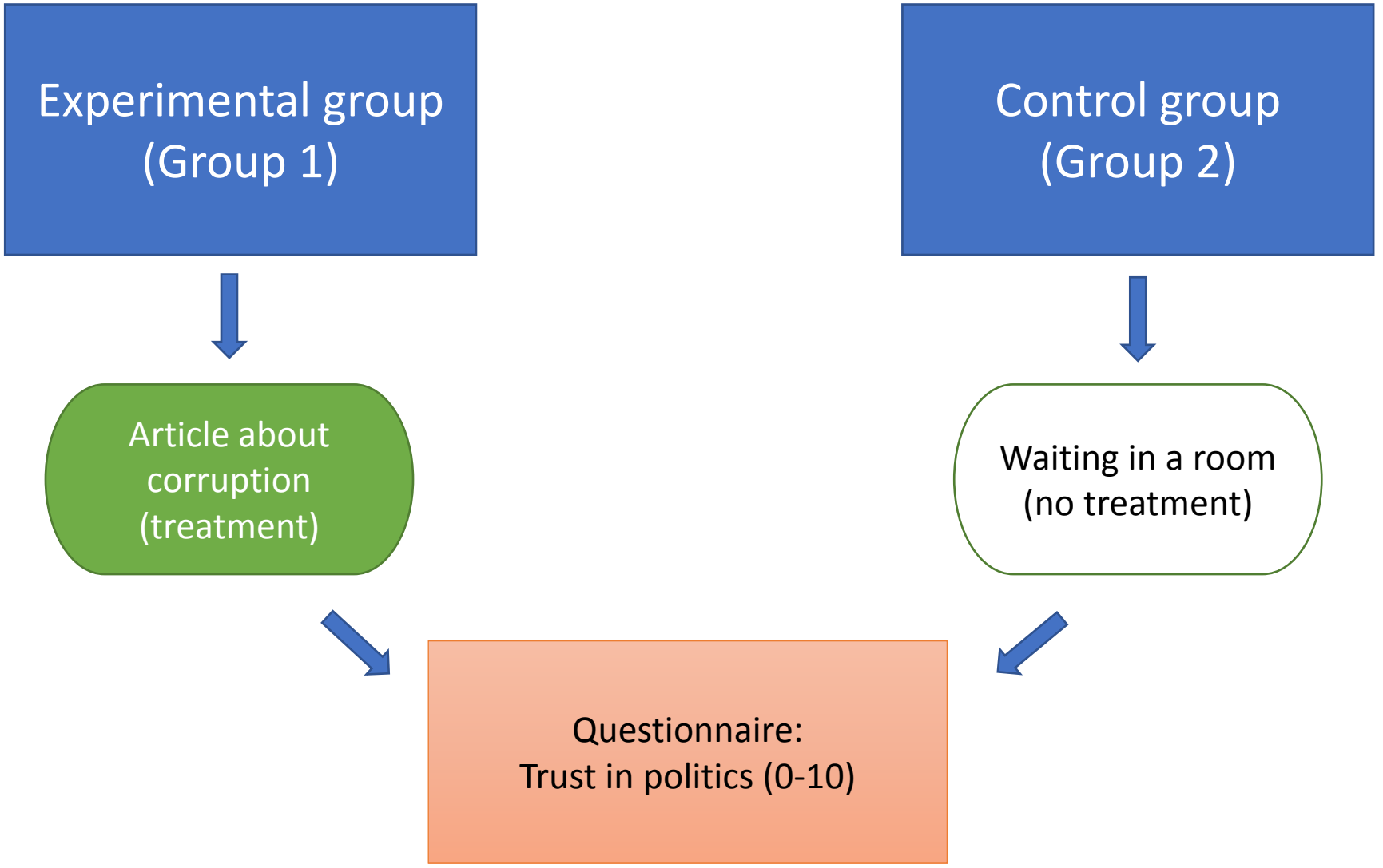
Testing theories

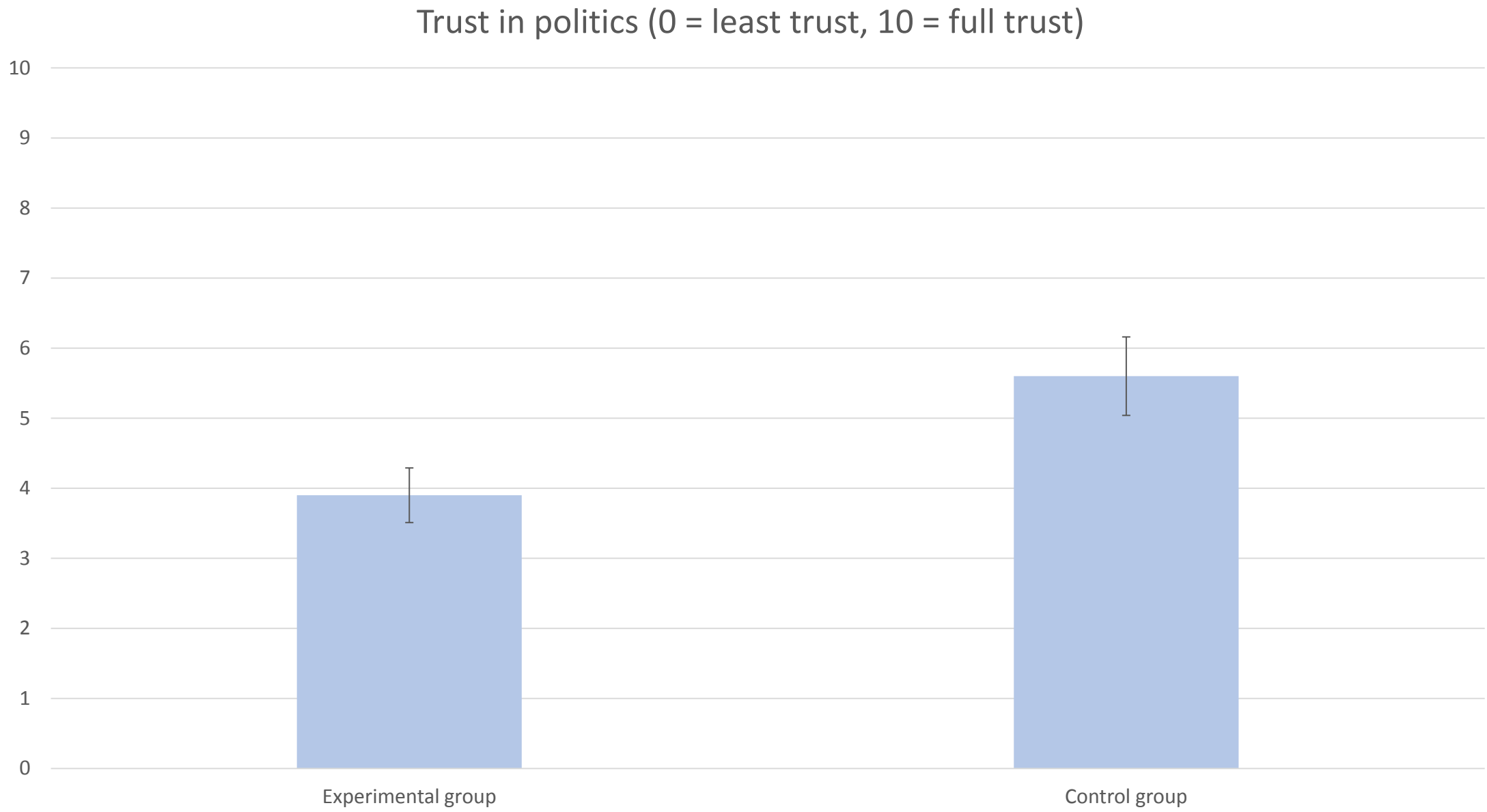
- Limits of observational studies
- We cannot save and load reality
- Ask a political party to go back in time and do a different campaign
- Experiments help us to overcome this impossible scenario

Experiment - basics

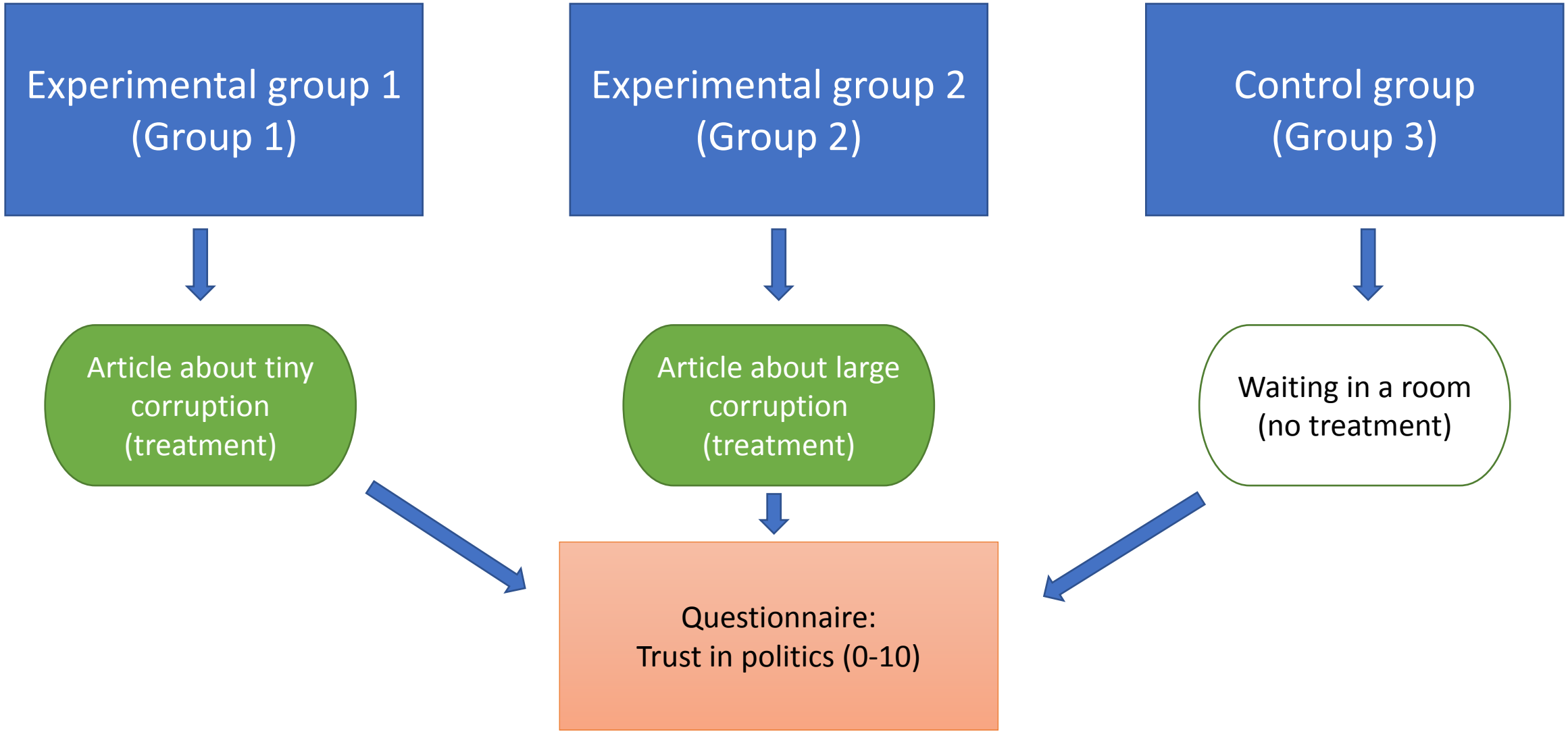
- Main role:
  - To estimate effect of independent variable on dependent variable
  - Almost perfect control for effects of all other variables
- The researcher manipulates with the independent variable
- Participants are split into at least two groups:
  - Each group obtains a different treatment (or no treatment at all)
- The analysis compares results for each group to estimate the effect of IV
- Many modifications

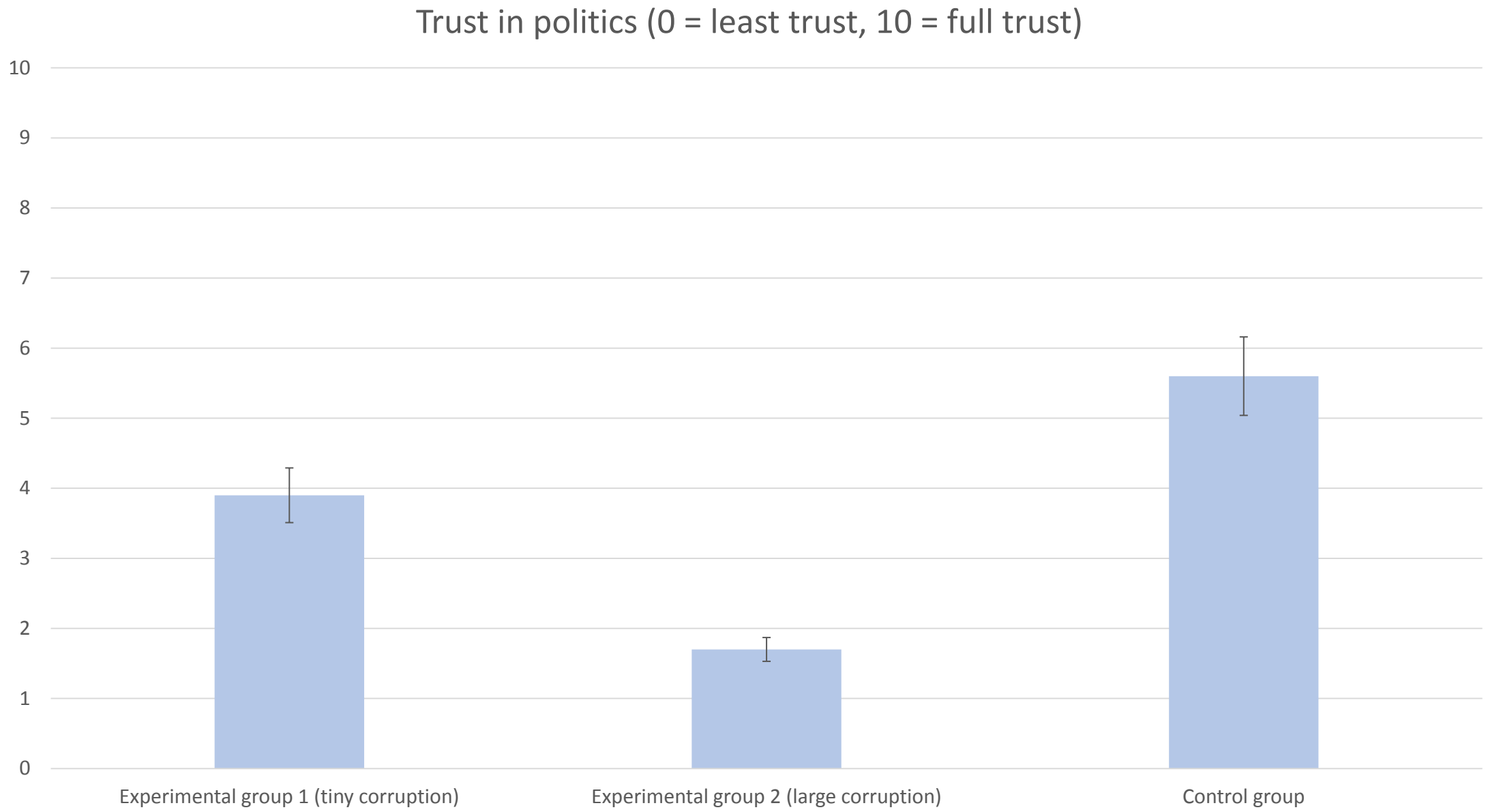
A simple two group design




Trust in politics (0 = least trust, 10 = full trust)
10
9
8
7
6
5
4
3
2
1
0
Experimental group
Control group

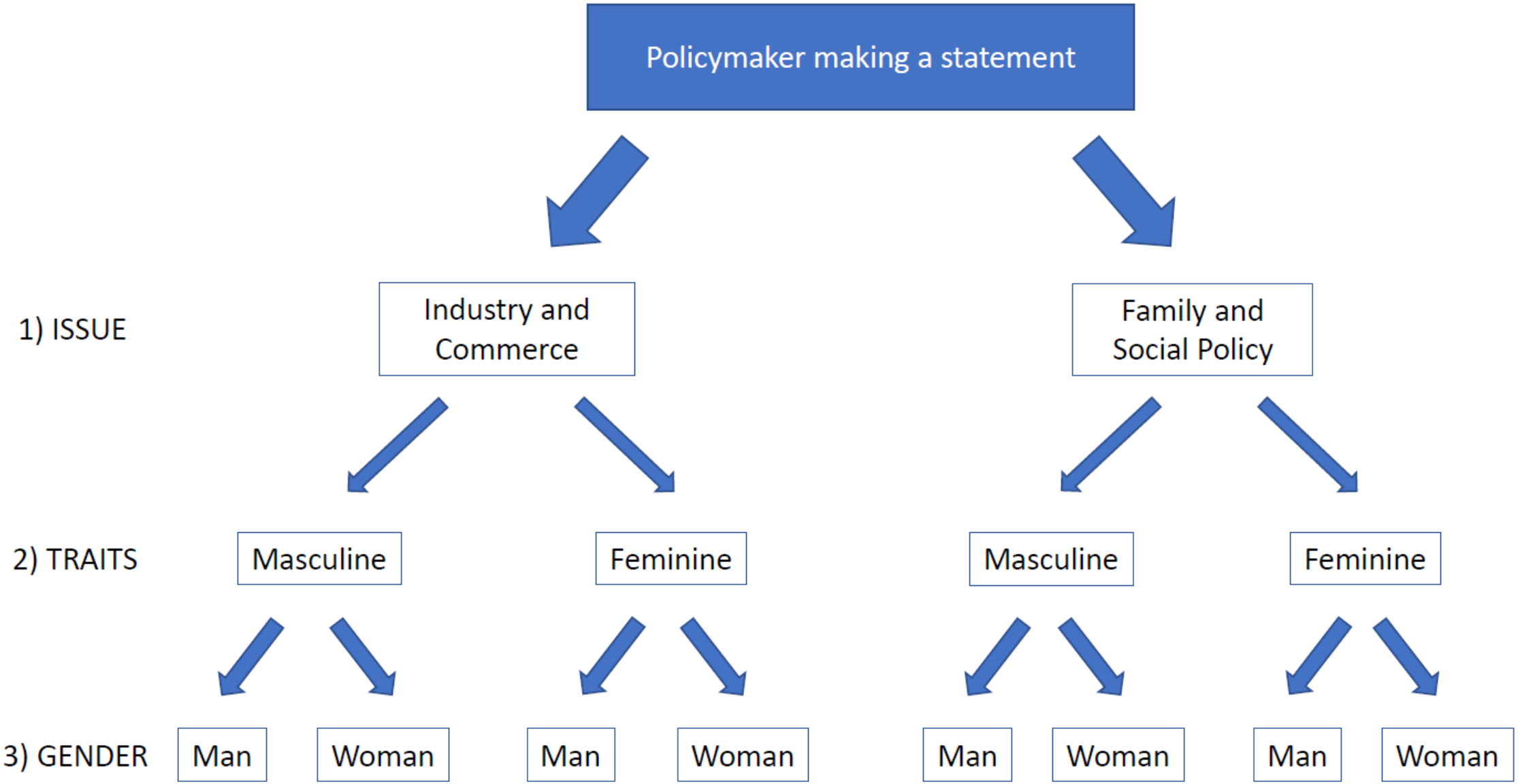
A three group design




Trust in politics (0 = least trust, 10 = full trust)
10
9
8
7
6
5
4
3
2
1
0
Experimental group 1 (tiny corruption)
Experimental group 2 (large corruption)
Control group

Groups

- Theoretically unlimited number of groups
- Beware of too complicated designs (especially if you have less experience)
- Costs of more groups (each groups needs participants)
- Control group is not a necessary feature
- Control group may receive a meaningless treatment (article about weather)


Policymaker making a statement
1) ISSUE
Industry and Commerce
Family and Social Policy
2) TRAITS
Masculine
Feminine
Masculine
Feminine
3) GENDER
Man
Woman
Man
Woman
Man
Woman
Man
Woman

How to divide participants into groups?

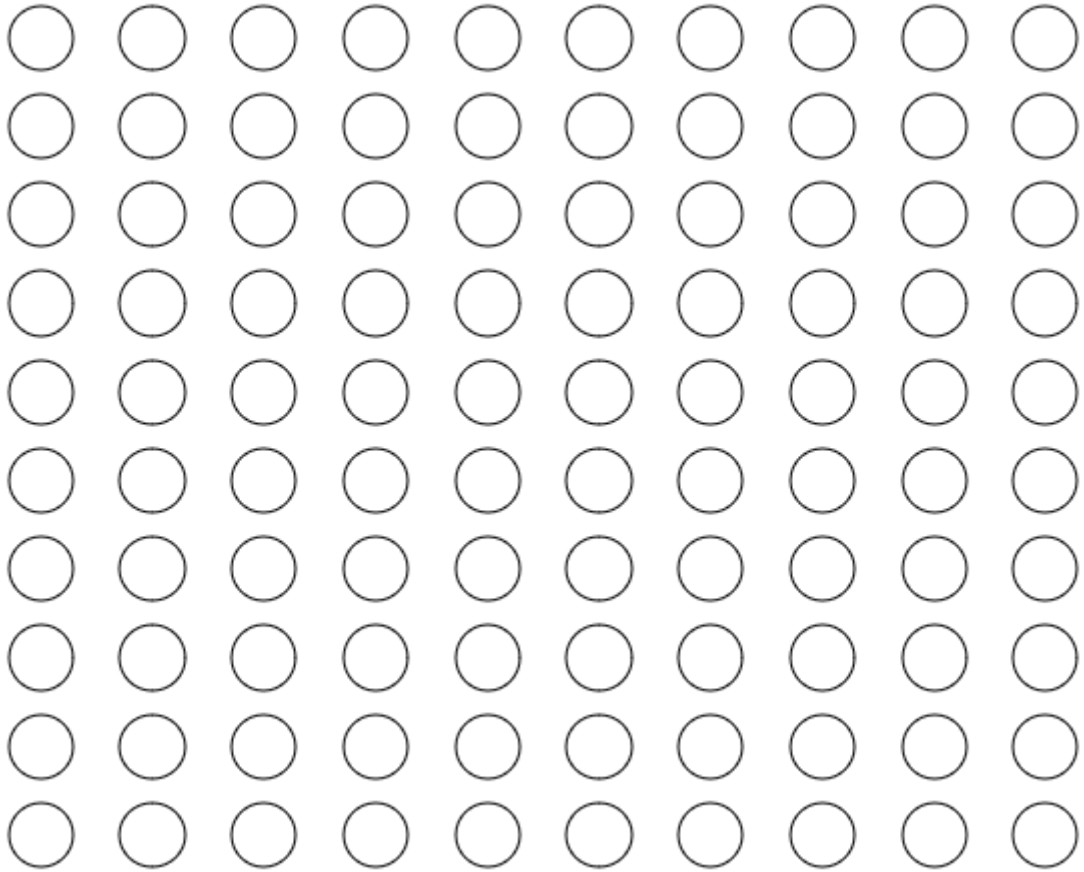
- Does corruption decrease trust in elected representatives?

- Laboratory experiment, 2 groups
  - Group 1: Article with corruption of a political official
  - Group 2: Article with daily duties of a political official

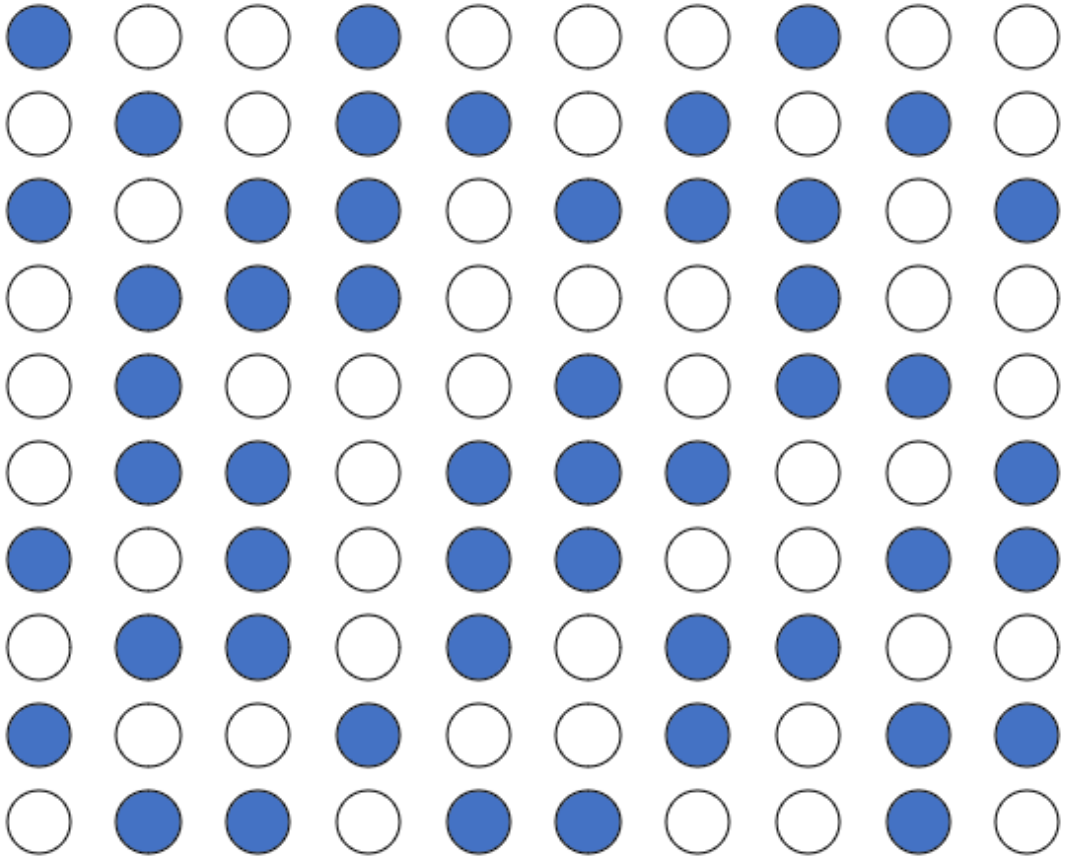
- Sample of 100 people

- How to divide the sample into groups?

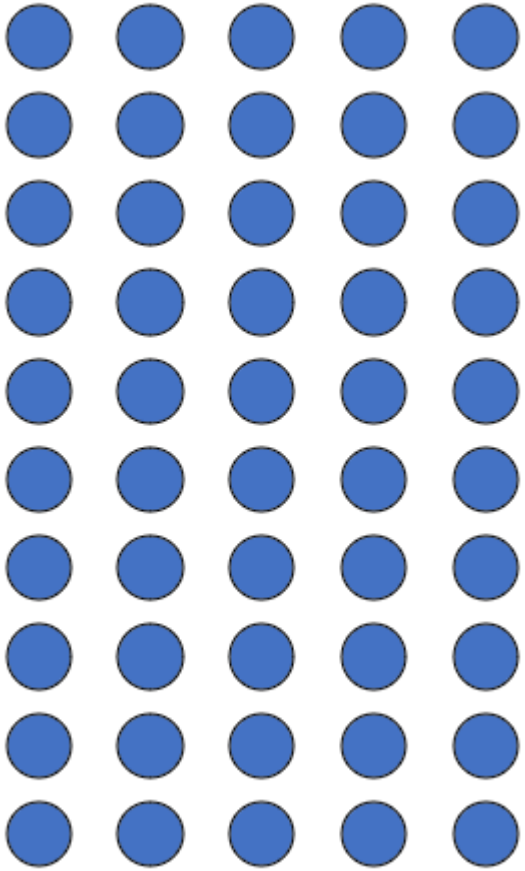
100 people



50 men (blue dots), 50 women (white dots)

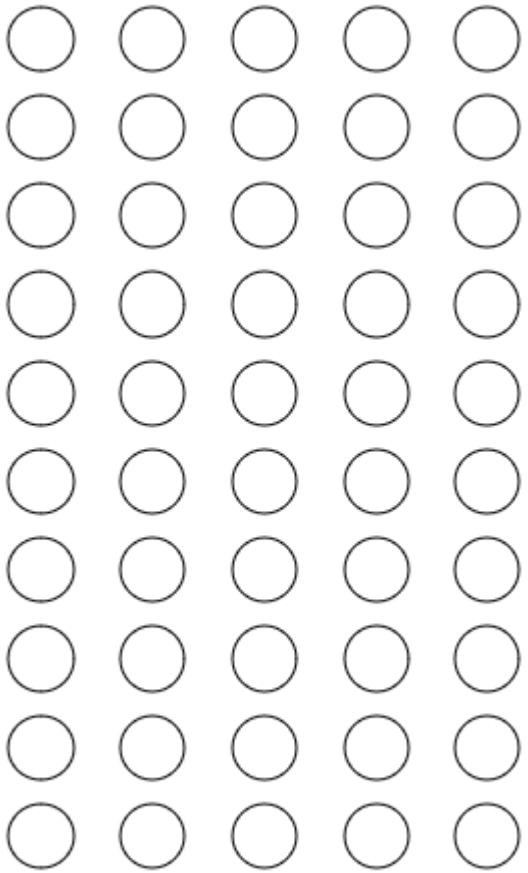


Wrong Solution



Experimental group:

50 M, 0 W



Control group:

0 M, 50 W

Post experimental questionnaire

- On a scale from 0 to 10 how do you trust the political official?

- Experimental group (50 M, 0 W):
  - Result: 4.2

- Control group (0 M, 50 W):
  - Result 6.7

- **The result** – reading an article on corruption lowers trust to political officials by 2.5 points

Post experimental questionnaire

- On a scale from 0 to 10 how do you trust the political official?

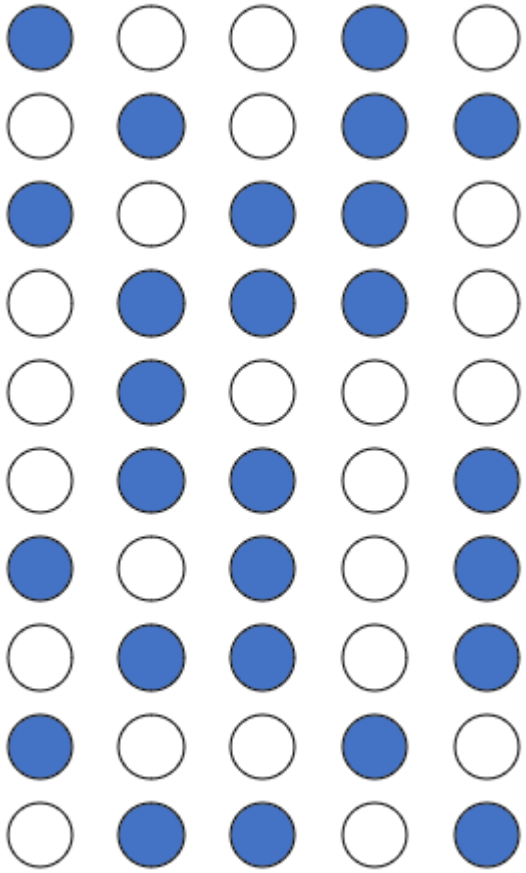
- Exp
  -

What if the article has no effect but men simply have lower trust in politicians?

- Control group (0 M, 50 W):
  - Result 6.7

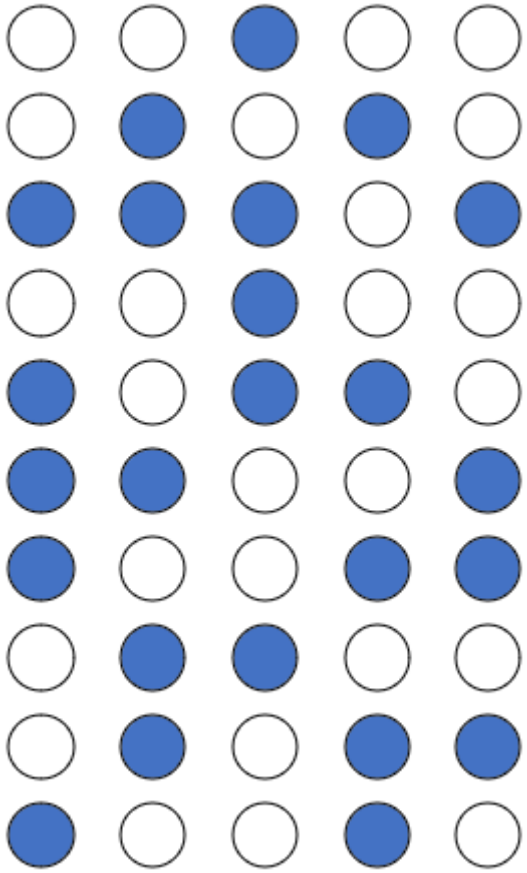
- **The result** – reading an article on corruption lowers trust to political officials by 2.5 points

Correct Solution



Experimental group:

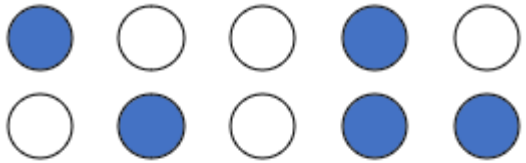
26 M, 24 W

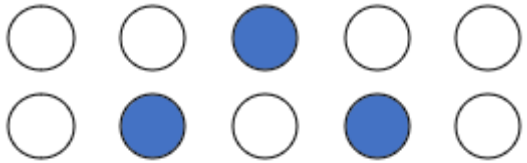


Control group:

24 M, 26 W

Correct Solution

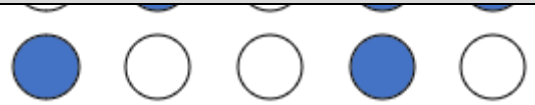




All differences (that can affect the results, e.g., age, income, education) are eliminated.

The only difference between the groups is our treatment (the article).

If the article has an effect, we will see it in different scores of groups and vice versa.



Experimental group:

26 M, 24 W

Control group:

24 M, 26 W

Random assignment vs. random sampling

- Never confuse these two concepts

- Random sampling:
  - Procedure of selection of participants
  - Typically a random choice (not always from the whole population, but only from students, locals etc.)

- Random assignment:
  - Procedure of assignment of participants into groups
  - **Random** assignment is a **critical feature** that defines experiments

Types of experiments

- Based on conditions:
  - Lab (laboratory)
  - Field
  - Survey

- Do not take the names literally:
  - Lab does not mean you need a laboratory, but controlled conditions
  - Field experiments do not (usually) take place at fields
  - Survey experiments can be held in laboratories

- Conditions (and not the place) decide

Lab Experiment

Field experiment

Natural experiments

- Experiments occur naturally:
  - Randomly assigned people who get basic income
  - Towns selected for high-speed Internet
  - Natural disaster that affects a part of a country

- Researchers do not provide a treatment, they “only” collect the data

- Assignment to groups is either random or it should be close to random

Transparency at the Local Level

- Topic: Reactive provision of information by local governments
- Effect of Freedom of Information (FOI) requests on responsiveness of local governments compared to less formal requests
- Experimental study on 2,926 municipalities in Slovakia
- Requests on information about local elections

Preparation of Experiment

- Random assignment of municipalities into three groups

- All municipalities obtained an information request

- Control group – baseline version
- Exp group 1 – baseline + moral paragraph
- Exp group 2 – baseline + FOI paragraph

- All requests sent via e-mail on Monday

A.1. Baseline variant

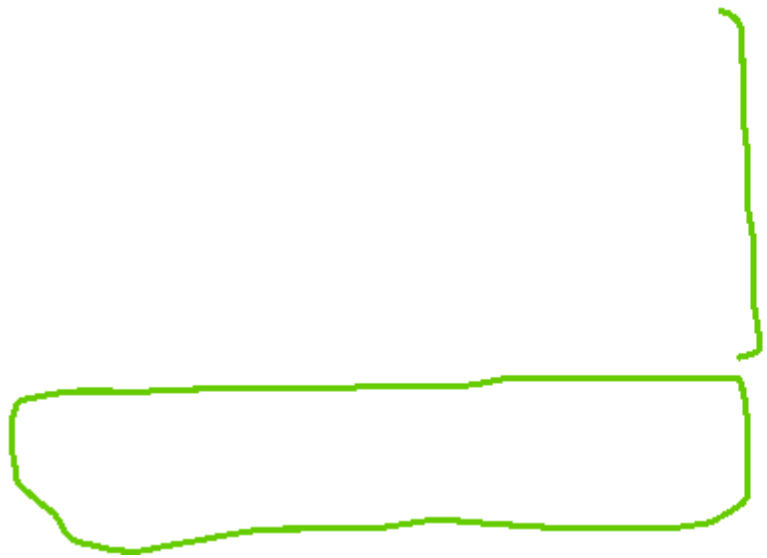
Dear Madam/Sir,

We are a research team from […] and we are focusing on local elections in Slovakia in 2010 and 2014. We however encountered a problem, as both the Statistical Office of Slovak Republic and the Ministry of Interior of Slovak Republic do not have data about results of candidates in these elections. According to these two offices, only municipalities possess such information.

In this regard, we would like to ask you to send us lists of candidates (both elected and not elected) that competed in your town in local elections and the number of votes they received. We need this data for the two most recent local elections, held in 2010 and 2014. In case local elections are held in more constituencies in your town, we kindly ask you to send us data for all these constituencies. We ask these data to be delivered via electronic mail.

Best regards,

A.2. Moral appeal variant



A.3. Legal variant

Results

Group	N	No response (%)	Response (%)
Control	961	78.0	22.0
Moral Appeal	922	77.3	22.7
Legal FOI	943	56.1	**43.9**

Validity

- Internal:
  - Conviction that the findings are the result of experimental treatment
  - Main threats – noncompliance and attrition
  - How to support

- External:
  - Ability to generalize the results beyond the group of participants
  - Experiments often conducted on student samples
  - Hawthorne effect – reaction to being observed
  - What to do – replications, different ways of measurement, better samples (population experiments)

Ethics

- Experiments are often confronted with ethical challenges
- Risk to current and later experiments
- Solution:
  - Good organization, ethical boards
  - Natural experiments

Experiment

- Strengths:
  - Effective isolation of other variables
  - Reliability, internal validity

- Weaknesses:
  - External validity (vs. experiments based on population sample)
  - Not always applicable in social sciences
  - Not all independent variables are subject of manipulation (age, values)
  - Need of replication