

# Chapter 7

## THREATS

Wei-Che, Tsai 蔡維哲

Yun-Ru, Huang 黃韻如

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# Outline

- Partial compliance
- Attrition
- Spillovers
- Evaluation-Driven Effects

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- Partial compliance
- Attrition
- Spillovers
- Evaluation-Driven Effects

- **What is?**
- **Why are they threats?**
- **How to limit threats?**

# 1.1 Partial compliance

- When people in the treatment group are not treated
  - ➔ do not complete the treatment course
  - ➔ do not receive the treatment
    - ➔ comparison group receive the treatment
- When implementation staff depart from the allocation or treatment procedure
- When people (defiers) exhibit the opposite of compliance



- Before the election



نام مرکز رای دهن: \_\_\_\_\_  
 نام مرکز رای دهن: \_\_\_\_\_  
 تاریخ: \_\_\_\_\_  
 کد: \_\_\_\_\_

بسمه تعالی و محترم آقای / خانم

جود لیت نظارت 472 مرکز رای بر حسب توافق نامه کمیسیون جریقیل انتخابات نظارت اورگا  
 دهن را بر عهده دارد.

جود لیت و برای او (ORCA) نظارت بر حسب توافق نامه کمیسیون جریقیل انتخابات نظارت اورگا  
 معلوم است. نام مرکز رای دهن شما در این نامه ذکر شده است. این مکتوب را در ظرف مهیج شده است  
 این مرکز نظارت بر کرسی شریک بر اساس رای دهن شما مرکز رای دهن و نظارت را از مکتوب  
 این ولایت نام مرکز رای دهن میانه صورت شعرائفی از گروه لیبول چندین مرکز دهنی دهن  
 انتخاب کرده است.

شما در هیچ - نظارت با یک انتخابات آزاد و بیرونی از قباغستان کسب خواهد کرد. نظارت اورگا  
 - بر حسب میگرداند این نام مرکز رای دهن که در این انتخابات کسان دهن است. نام شما در این نامه  
 گذاشته بر حسب نظارت انتخاباتی داخلی و خارجی این انتخابات در نهایت از نظارت شعرائفی  
 از این انتخابات - موسسات خارجی و جنبه های داخلی و خارجی خواهد بود. نام شما در این نامه  
 انتخابات را با این انتخابات که از طرف این شعرائفی حاصل از نظارت جریقیل انتخابات کسب و  
 انتخابات در کابل نظر میشود. جریقیل انتخابات کسب خواهد کرد. جریقیل کمیسیون  
 در پایان این نامه ای که این مکتوب بر حسب شما قرار گرفته و شما این مکتوب  
 جریقیل انتخابات کسب خواهد کرد.

از همکاری شما قبلاً اظهار سپاس.

سید محترم

جای عبدالحی سارکزی  
 معاون نظارت اورگا  
 سید محترم مرکز رای دهن: \_\_\_\_\_  
 ریاض السور

- A letter would be sent to some of the polling station

→ treatment group

## Letter treatment

- Right after the election



- Take photos in every polling station
- Only some of them were warned with the letter



**WHAT IF THE TREATMENT  
GROUP**

**DID NOT RECEIVE THE WARNING  
LETTER?**

memegenerator.net



**WHAT IF THE TREATMENT  
GROUP**

**DID NOT RECEIVE THE WARNING  
LETTER?**

memegenerator.net

**WHAT IF THE COMPARISON  
GROUP**

**KNOWS ABOUT THE WARNING  
LETTER?**

memegenerator.net

**Partial Compliance**

**(Noncompliance)**

## 1.2 why are they threats

Noncompliance can

- **reduce the difference** between the treatment and comparison group
- **reduce comparability** between the treatment and comparison groups
  - ➔ impossible to estimate the true impact of a program

# How to limit

- Make take-up of the program easy
- Incentivize take-up of the program
- Compartmentalize and routinize field tasks
- Randomize at a higher level

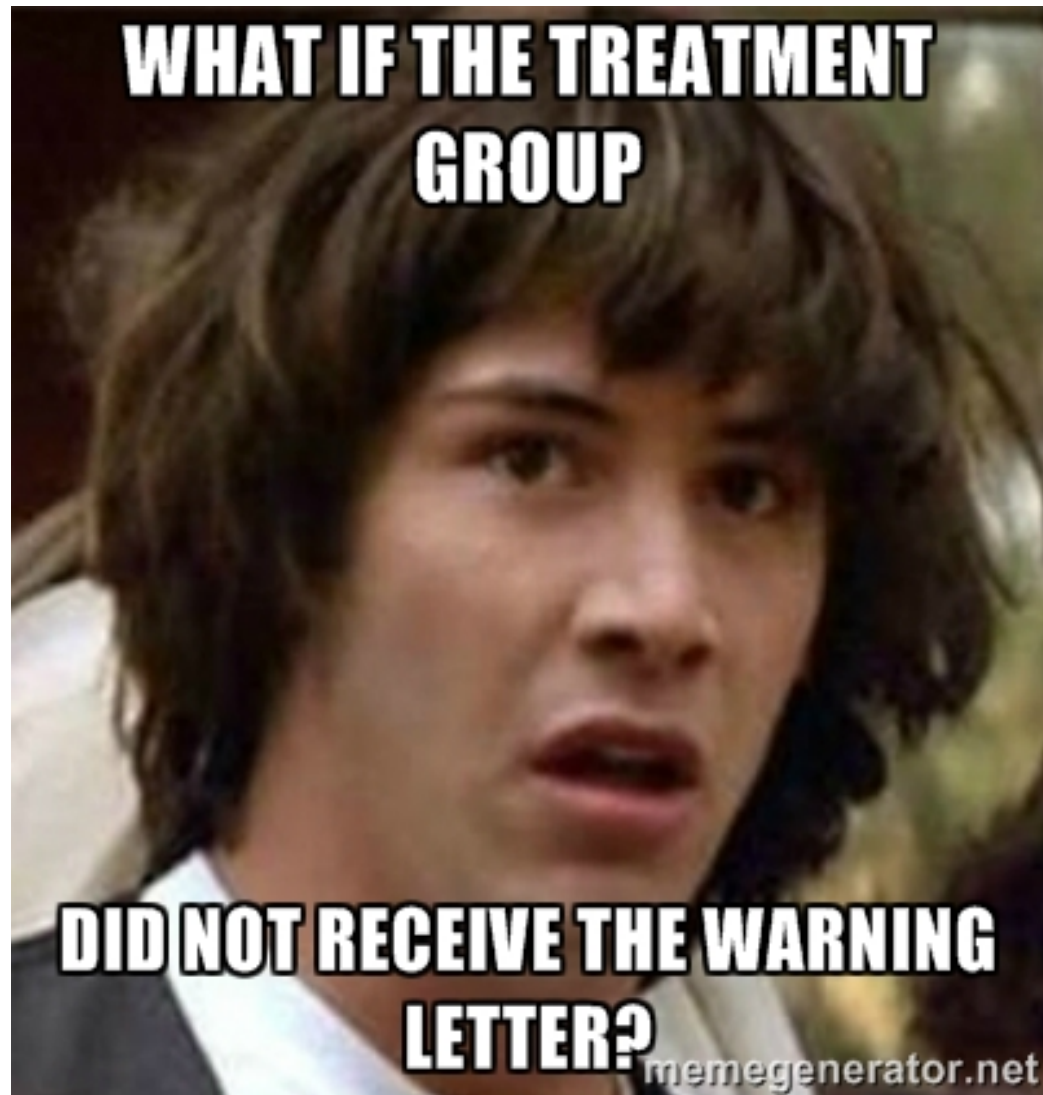
# How to limit

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- Include a basic program that everyone receives, including comparison group
- How can we document compliance and identify defiers
  - Document who receives what treatment
  - Identify defiers

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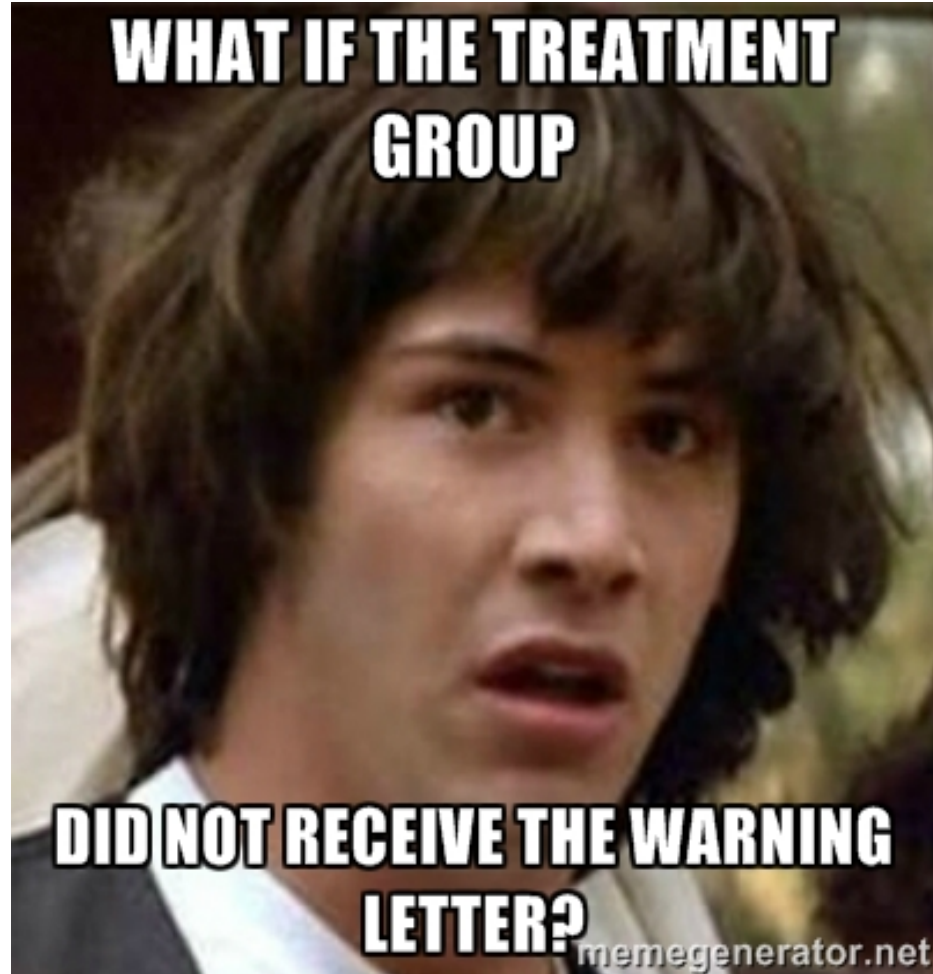
- Receiving letter = take-up  
= treatment
- Not receiving letter  
→ underestimation of treatment

How to limit



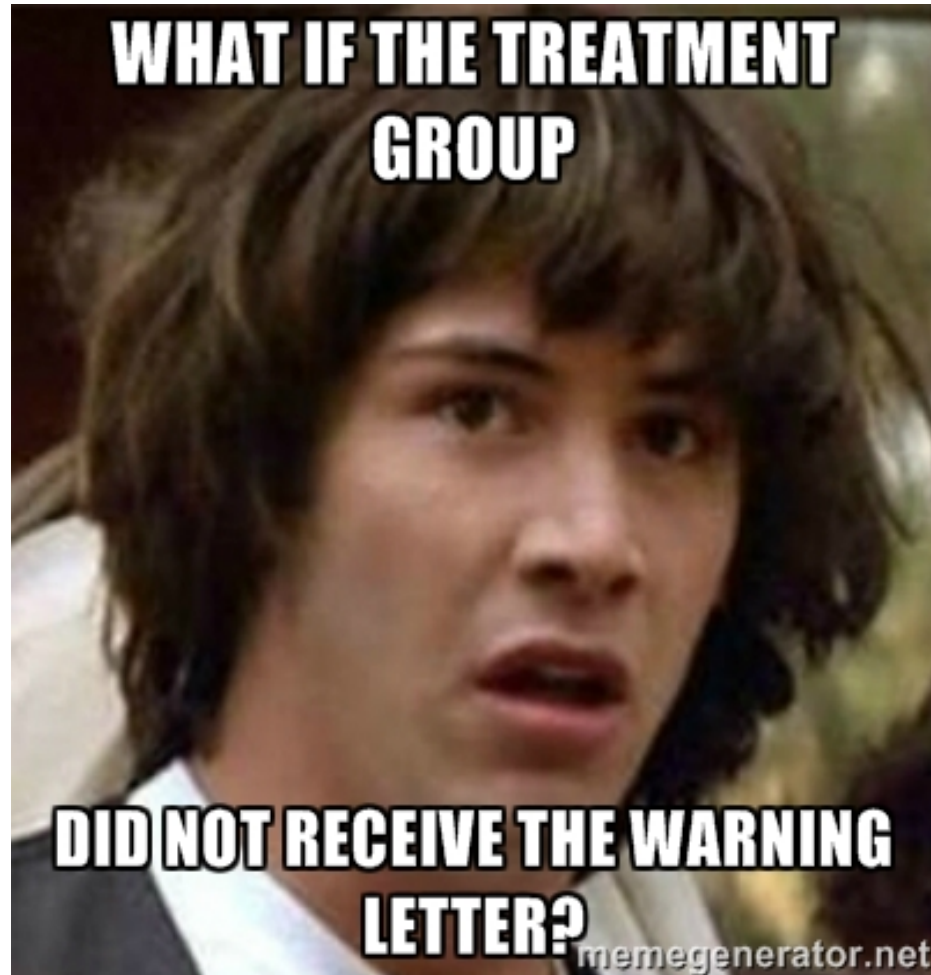


How to limit



# How to limit

- Make take-up of the program easy



to avoid letter delivery failure

→ assign treatment to more convenient locations

## 2.1 attrition

- When people
  - ➔ drop out of the study and can no longer be measured
  - ➔ still participating but can not be measured
  - ➔ refuse to answer some questions

## 2.1 attrition

- When people **cannot be measured**
  - ➔ drop out of the study and can no longer be measured
  - ➔ still participating but can not be measured
  - ➔ refuse to answer some questions

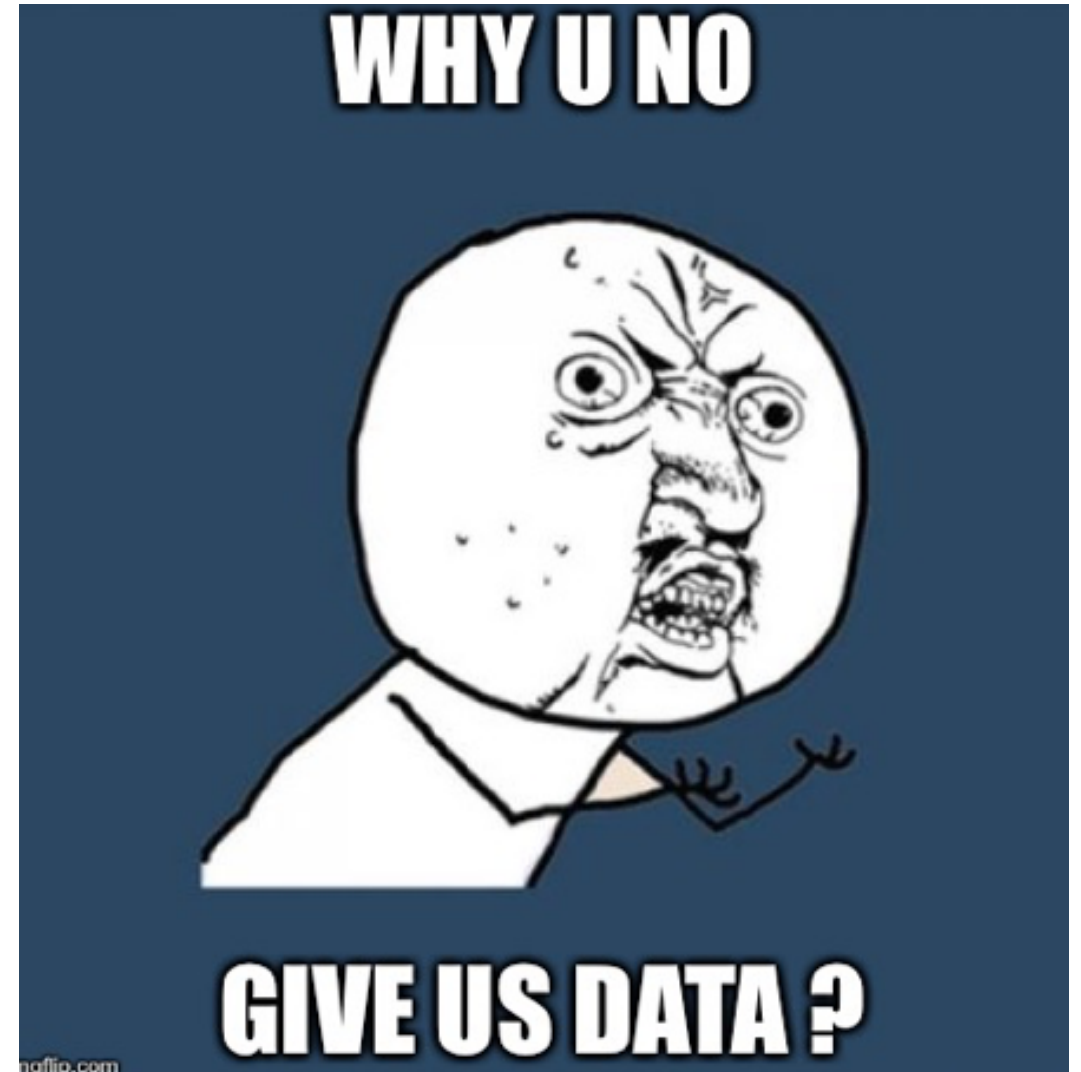
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## Missing Data Problem

## 2.1 attrition

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  - still participating but can not be measured
  - refuse to answer some questions



**IF I LET THE CAMERA  
GUY IN**



**I WILL GET CAUGHT SOMEDAY**

**IF I LET THE CAMERA  
GUY IN**



**I WILL GET CAUGHT SOMEDAY**

memegenerator.net

**LOCK**



**ALL THE DOORS**





**No data**

**➔ Attrition Problem**

## 2.2 why are they threats

Attrition can

- reduce the comparability of treatment and comparison groups
- lower the statistical power

## 2.3 how to limit

- Use a research design that promise access to the program to all over time
- Change the level of randomization
- Improve data collection

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- Use a research design that promise access to the program to all over time
- Change the level of randomization
- Improve data collection
  - Pilot the data collection instrument and procedures
  - Follow up on everyone originally randomized
  - Do not wait too long to follow up
  - Improve follow-up by collecting tracking data routinely
  - Reduce attrition through survey timing
  - Subsample
  - Provide incentives

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## 2.3 how to limit

- Reduce attrition through survey timing



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- Reduce attrition through survey timing

e.g. Announced to come over at 10, arriving at 8 o'clock



# Spillovers effect, or Externalities

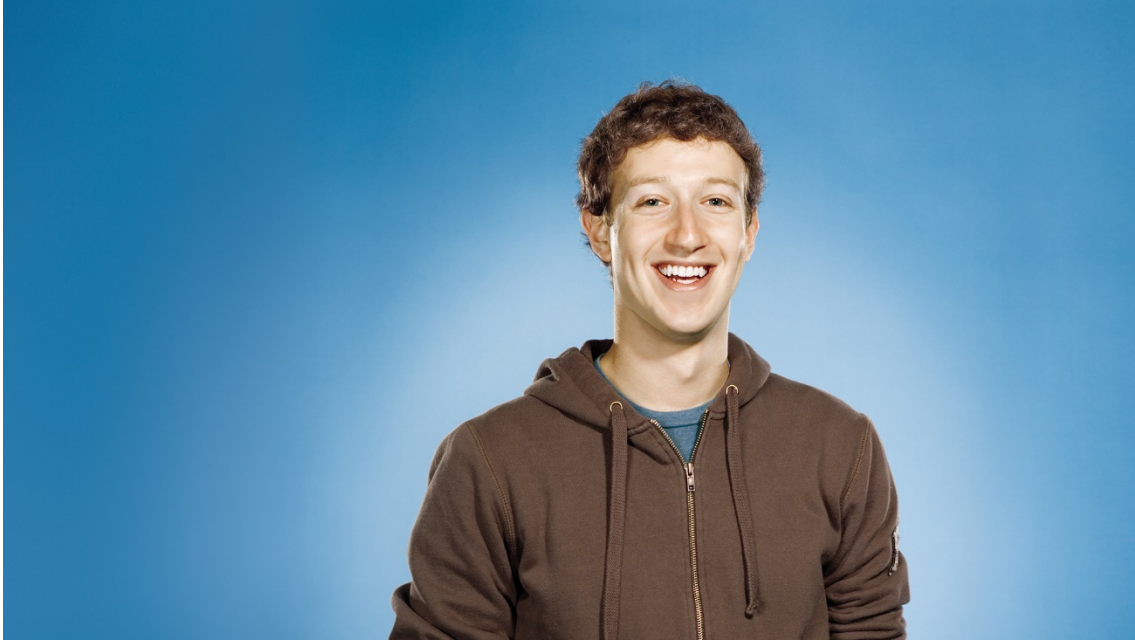


# 3.1 Spillovers effect



- Facebook
- Data Scientist & News Feeds  
Algorithm Engineer & Experiment  
Economist

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- Facebook
- Data Scientist & News Feeds  
Algorithm Engineer & Experiment  
Economist
- Zuckerberg needs data to analyze  
and make decisions
- He wants to enhance page reach  
rate to earn more money

## 3.1 Spillovers effect



- Facebook
- Data Scientist & News Feeds  
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Economist
- Zuckerberg need data to analyze  
and make decisions
- He wants to enhance page reach  
rate to earn more money
- Run a Experiment

# 3.1 Spillovers effect



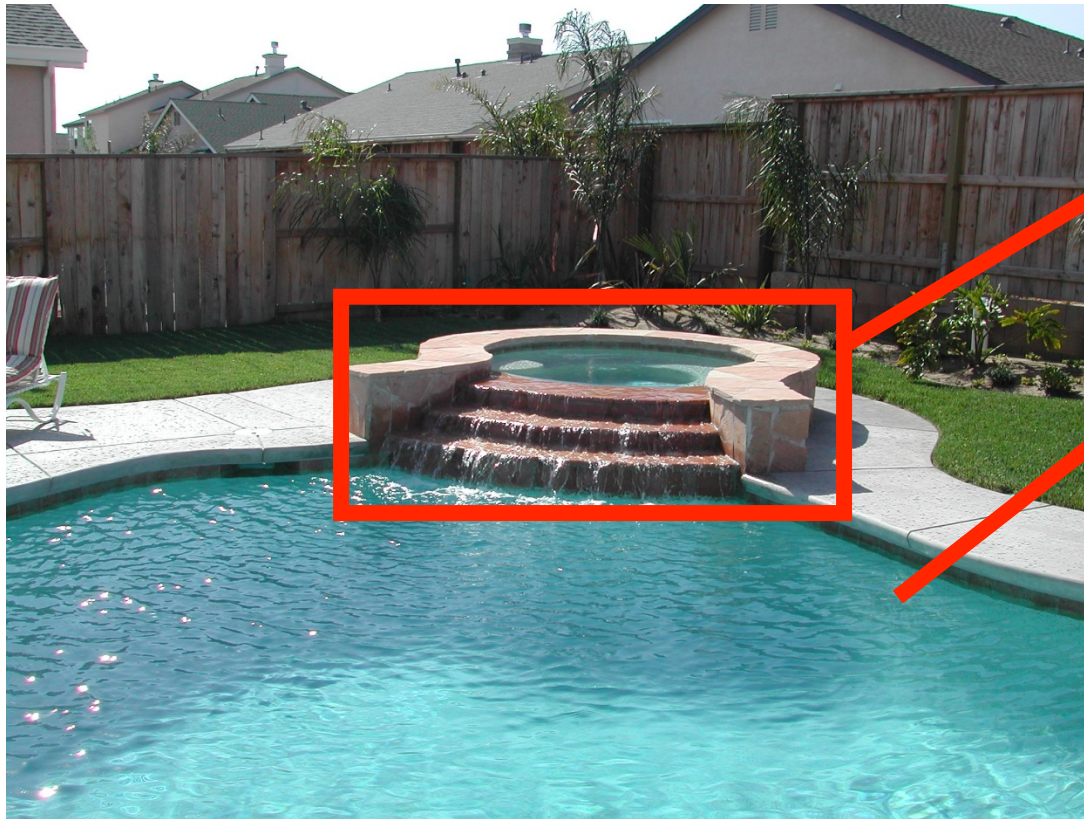
- Target: Enhance page reach
- Control Group: some fans
  - News Feeds Algorithm A
- Treatment Group: the other fans
  - News Feeds Algorithm B
- Now You Know A or B, Which One is Better

# 3.1 Spillovers effect

The image shows a Facebook post from Joseph Tao-yi Wang. The post text discusses market efficiency and price bubbles, mentioning 'water price' and 'spillover effect'. It includes a link to an opinion article on the website 'OPINION.CW.COM.TW'. Below the text is a photo of a yellow YouBike. The post has 44 shares, which is highlighted with a red box. The left sidebar shows the user's profile information, including their name, university affiliation (NTU), and a list of recent posts. The right sidebar shows a '最新' (Latest) section with dates from 2012 to 2015.

- A lot of share!
- Treatment group and control group interact with each other
- The control group see this post is not because the News Feeds Algorithm A, but because Treatment group's share

## 3.1 Spillovers effect



Treatment Group

Control Group

It is Indirect effect of a program on those who are not been treated

# 3.1 Spillovers effect

- Physical
  - contagious disease
- Behavioral
  - imitate
- Informational (social learning)
  - Post share on Facebook
- General equilibrium effect
  - Policy encourage hire younger worker, then the firm fire older worker

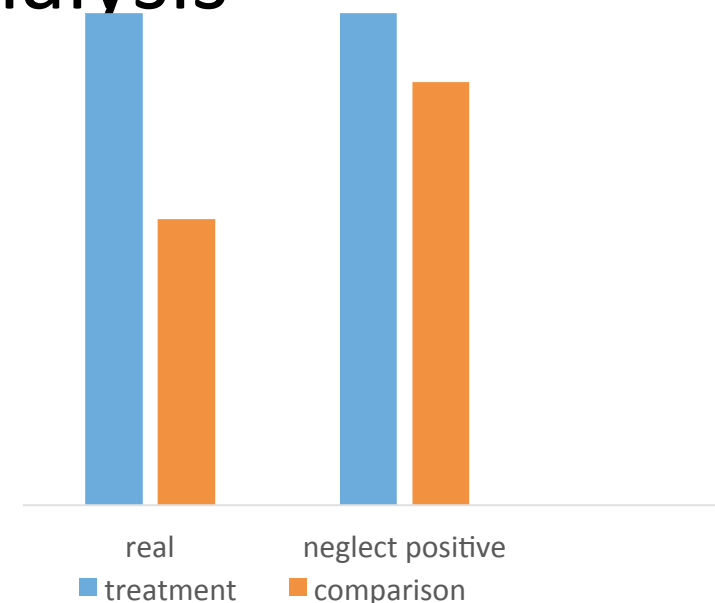
## 3.2 Why are they threats

- It reduce the quality of the counterfactual
  - Comparison outcome reflect the indirect program effect
  - Control group outcome is not absence of the program



## 3.2 Why are they threats

- It reduce the quality of the counterfactual
  - Comparison outcome reflect the indirect program effect
  - Control group outcome is not absence of the program
- If we do not take them into account in analysis
  - Neglect positive spillover effect:
    - underestimate
  - Vice versa



## 3.3 How to limit threats

- Identify potential spillovers
  - Who? How? What?
  - Previous studies, theories, common sense etc.

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- Reduce spillovers to the comparison group
  - Change level of randomization (Module 4 )

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- Identify potential spillovers
  - Who? How? What?
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- Reduce spillovers to the comparison group
  - Change level of randomization (Module 4 )
- Estimate by measuring outcomes of the untreated in or near the treated units
  - Afghanistan Election Fraud case: Test Spatial Externalities and chilling effect
  - Facebook : computer (numerical) simulation, cluster

## 4.1 Evaluation-driven effect

- Hawthorne effect
- John Henry effect
- Resentful demoralization effect
- Demand effect
- Anticipation effect
- Survey effect

# Hawthorne effect

- When the treatment group works harder
- They feel lucky, don't want to waste this rare opportunity
- they think that they are “chosen”
- They are thankful and don't want to fail the program
- Hawthorne Works(霍桑工廠)



# John Henry effect

- When the comparison group compete with the treatment group
- John Henry worry that after steam drill were introduced, he would become redundant, so he work harder.
- He challenge steam engine and win the competition but died from overexertion



# Resentful demoralization effect

- When the comparison group resents not being given the treatment, they behave worsen
- The treatment is desirable



# Demand effect

- Stanford prison experiment
- Some play guards, some play prisoner
- Demand effect critics
- When the participant change their behavior in response to their perception of what the evaluator is trying to test



# Anticipation effect

- When the comparison group change their behavior because they think they will receive the program in the future
- Phase-in design
- Micro-finance program



# Survey effect

- When being surveyed can change the future behavior
- Frequent test change students test skill especially in multiple choice question



Evaluation-driven effect	Treatment group	Comparison group
Do better	Hawthorne effect	

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Survey affect what they do	Survey effect	Survey effect

## 4.2 Why they are threats

- Undermine power and generalizability
  - Afghanistan Election Fraud case: does it still work in other country?
- Undermine comparability
  - Program effect instead of treatment effect
- Bias impact estimate
  - Inflate the difference : Hawthorne effect and Resentful demoralization effect
  - Deflate the difference : John Henry effect

## 4.3 How to limit

- Use a different level of randomization (Module 4.2)
- Do not announce the phase-in
- Make sure the staff is impartial
- Make sure the treatment and comparison groups get equivalent interaction with evaluation staff
- Measure the evaluation-driven effects on a subset of the evaluation sample

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# Conclusion

- Partial compliance
- Attrition
- Spillovers
- Evaluation-Driven Effects
- Identify them , know why they are threats and try to fix them