Evidence-Informed Policy

POLSCI 4SS3

Winter 2024

Policy

- **Policy** is an umbrella term to describe government programs or operations at different levels
- **Examples:**
  - How long should form 57B be?
  - Should we get help from private clinics to clear surgey backlogs?
  - Should the education budget increase?
  - When should the next federal election be held?

Evidence-Informed

- Of course we want to base policy on evidence!
- But there is no *objective* evidence when it comes to human behavior
- We say evidence-*informed* because the best we can do is try to prove ourselves wrong, but we cannot *base* policy on evidence the same way medicine does

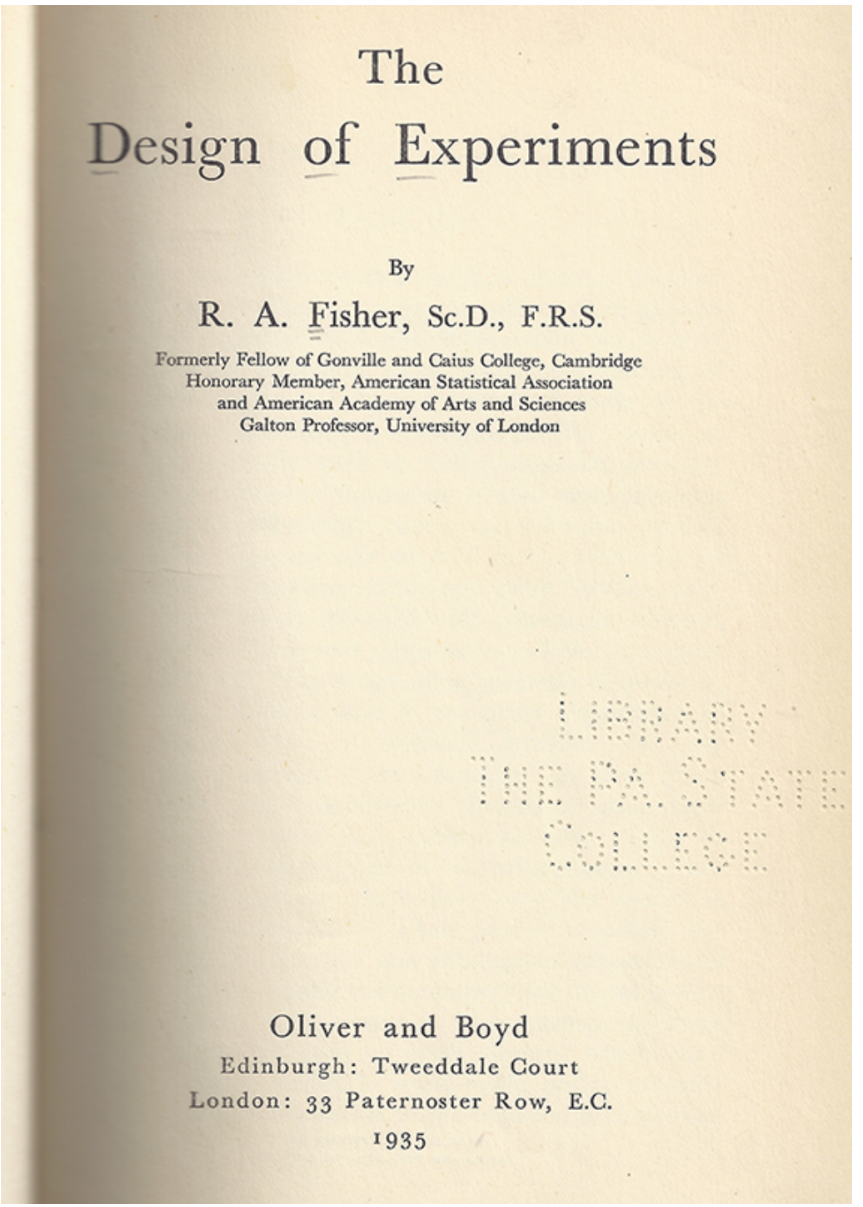
Two approaches

1. Evidence as **insight**

2. Evidence as **evaluation**

How can you determine if a policy works?

Example



The
Design of Experiments

By

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Oliver and Boyd
Edinburgh: Tweeddale Court
London: 33 Paternoster Row, E.C.
1935

The lady tasting tea

A lady declares that by tasting a cup of tea made with milk she can discriminate whether the milk or the tea infusion was first added to the cup

How do you **evaluate** this claim?

An experiment

- Suppose we have eight milk tea cups
- 4 milk first, 4 tea first
- We arrange them in random order
- Lady knows there are 4 of each, but not which ones

Results

	True Order	
Lady's Guesses	**Tea First**	**Milk First**
Tea First	3	1
Milk First	1	3

- She gets it right $6/8$ times
- What can we conclude?

Problem

- How does “being able to discriminate” look like?
- Same for policy, we don’t know how the world where the policy works look like
- But we **do know** how a person without the ability to discriminate milk/tea order looks like
- This lets us make **probability statements** about this **hypothetical world of no effect**

A person with no ability

Count	Possible combinations	Total
0	xxxx	
1	xxxo, xxox, xoxx, oxxx	
2	xxoo, xoxo, xoox, oxox, ooxx, oxxo	
3	xooo, oxoo, ooxo, ooox	
4	oooo	

- This is symmetrical!

A person with no ability

Count	Possible combinations	Total
0	xxxx	
1	xxxo, xxox, xoxx, oxxx	
2	xxoo, xoxo, xoox, oxox, ooxx, oxxo	
3	xooo, oxoo, ooxo, ooox	
4	oooo	

A person with no ability

Count	Possible combinations	Total
0	xxxx	$1 \times 1 = 1$
1	xxxo, xxox, xoxx, oxxx	$4 \times 4 = 16$
2	xxoo, xoxo, xoox, oxox, ooxx, oxxo	$6 \times 6 = 36$
3	xooo, oxoo, ooxo, ooox	$4 \times 4 = 16$
4	oooo	$1 \times 1 = 1$

- A person just guessing gets $6/8$ cups right with probability $\frac{16}{70} \approx 0.23$

A person with no ability

Count	Possible combinations	Total
0	xxxx	$1 \times 1 = 1$
1	xxxo, xxox, xoxx, oxxx	$4 \times 4 = 16$
2	xxoo, xoxo, xoox, oxox, ooxx, oxxo	$6 \times 6 = 36$
3	xooo, oxoo, ooxo, ooox	$4 \times 4 = 16$
4	oooo	$1 \times 1 = 1$

- And **at least** $6/8$ cups with $\frac{16+1}{70} \approx 0.24$

p-values

- If the lady is **not** able to discriminate milk-tea order, the chance of observing 6/8 correct guesses or better is 24%
- We can translate this to general statements about policies or experiments
- *If* the **null hypothesis** of no effect is true…
- … the **p-value** is the probability of observing a result *equal or more extreme* than what is originally observed
- Smaller p-values give more evidence **against** the null, which helps us make a case for the policy having an effect

Diagnosing hypothesis tests

- A convention in the social sciences is to claim that something with $p < 0.05$ is *statistically significant*[1]
- Committing to a **significance level** implies accepting that sometimes we will get $p < 0.05$ by chance
- This is a **false positive** result
- A good answer strategy as a **controlled** false positive rate `(more in the lab!)`

Next Two Weeks

Field Experiments

Focus on: Research design alternatives

Break time!


Lab