

# Lab 12: Experiments

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## Experiments

- **Claimant Experiment:** "A random sample were instructed that they would qualify for a cash bonus of \$500 if they found a job (of 30 hours or more per week) within 11 weeks of filing the UI claim, and if they held that job for 4 months"
- **Employer Experiment:** "A second random sample were told that their next employer would qualify for a cash bonus of \$500 if they, the claimants, found a job within 11 weeks of filing the UI claim, and if they retained that job for four months.

## Eligibility criteria

An individual had to

1. File a claim for UI between July 29, 1984 and November 17, 1984
2. Be eligible for 26 weeks of UI benefits
3. Register with one of the 22 Job service offices in northern and central Illinois
4. Be at least 20 years old, but less than 55

Each claimant was assigned to one of three groups: control group, Claimant Experiment and Employer Experiment based on the last two digits of his/her SSN. Claimants were asked to sign an "agreement to participate".

What is the advantage of experiments?

## Causal effects

- Policy makers are usually interested in causal effects, not just correlations.
- To identify a causal effect you compare average of outcomes between the treatment and control groups

$Y_{0i}$  = Potential outcome without treatment

$Y_{1i}$  = Potential outcome with treatment

$g_i = 1$  if treatment group, 0 if control group

$Y_{1i} - Y_{0i}$  = Treatment effect

## Difference in group means

$$E[Y_i | g_i = 1] - E[Y_i | g_i = 0]$$

Difference in group means = ATE + Selection bias

ATE (Average Treatment Effect):  $E(y_{1i}) - E(y_{0i})$

Selection bias: Selection of individuals into treatment

In randomized trials, selection bias is (hopefully) zero!

## ABC issues in randomized experiments

- Attrition: It's a type of selection bias caused by loss of participants

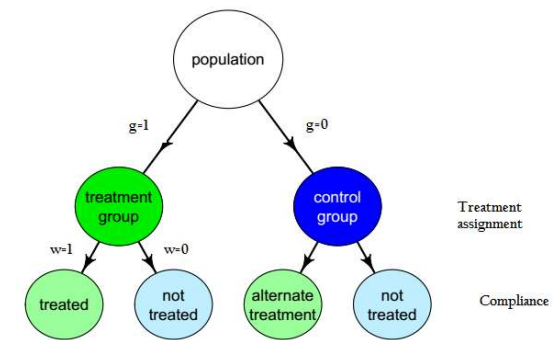
- Balance: Treatment and control groups are similar in all measurable ways

$$X_i = \gamma_0 + \gamma_1 \text{Treatment}_i + v_i$$

- Compliance: Some people assigned to treatment do not experience the treatment

TABLE 2—CHARACTERISTICS OF CLAIMANTS ASSIGNED TO EXPERIMENTAL GROUPS

	Control		Claimant Experiment		Employer Experiment	
	N	Proportion	N	Proportion	N	Proportion
Total	3,952	1.000	4,186	1.000	3,963	1.000
Male	2,162	0.547	2,357	0.563	2,131	0.538
White	2,497	0.632	2,723	0.651	2,565	0.647
Black	1,072	0.271	1,050	0.251	1,014	0.256
Hispanic, Native American, Other	383	0.097	413	0.099	384	0.097
Age 20–29	1,680	0.425	1,827	0.436	1,679	0.424
Age 30–39	1,315	0.333	1,357	0.324	1,292	0.326
Age 40–49	708	0.179	776	0.185	740	0.187
Age 50–54	248	0.063	226	0.054	252	0.064
Weekly Benefit Amount:						
\$51	347	0.088	355	0.085	333	0.084
\$52–\$90	794	0.201	887	0.212	861	0.217
\$91–\$120	666	0.169	738	0.176	711	0.179
\$121–\$160	749	0.190	822	0.196	716	0.181
\$161	1,396	0.353	1,384	0.331	1,342	0.339
Dependents' Allowance	1,834	0.323	1,955	0.345	1,883	0.332



## Intention To Treat (ITT)

We compare the means of those assigned to treatment (regardless of their compliance) to those in the control group.

$$ITT = E(y|g = 1) - E(y|g = 0)$$

$$Y_i = \beta_0 + \beta_1 g_i + v_i$$

ITT estimates will be smaller in magnitude than the true treatment effect. The more numerous the non-compliers, the closer to zero will be the ITT estimates

TABLE 3—MEANS OF PROGRAM VARIABLES BY EXPERIMENTAL GROUP\*

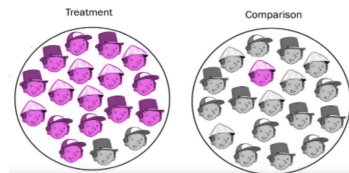
	Control		Claimant Experiment		Employer Experiment	
	Mean	SE of Mean	Mean	SE of Mean	Mean	SE of Mean
<b>Benefits Paid (\$):</b>						
1) State Regular, First Spell	2,267	27.5	2,074	26.7	2,159	27.4
2) Total, First Spell	2,558	33.8	2,329	32.9	2,446	33.8
3) State Regular, Benefit Year	2,487	27.0	2,328	26.3	2,426	27.0
4) Total, Benefit Year	2,786	33.1	2,592	32.2	2,725	33.8
<b>Weeks of Insured Unemployment:</b>						
1) First Spell	18.3	0.205	17.0	0.199	17.7	0.205
2) Benefit Year	20.1	0.194	18.9	0.188	19.7	0.194
	Proportion	SE of Proportion	Proportion	SE of Proportion	Proportion	SE of Proportion
<b>Proportion of Claimants Who:</b>						
1) Exhausted Benefits	0.478	0.008	0.446	0.008	0.464	0.008
2) Ended Benefits within 11 weeks	0.353	0.008	0.408	0.008	0.384	0.008
N	3,952		4,186		3,963	

## Average Treatment Effect on the Treated

$$ATT = E(y_{1i}|w = 1) - E(y_{0i}|w = 0)$$

$$ATT = \frac{ITT}{\Pr(w = 1|g = 1) - \Pr(w = 1|g = 0)}$$

You adjust for the probability of becoming purple



## Randomized trials in Illinois by Woodbury and Spiegelman

Between mid 1984 and mid 1985, New claimants for Unemployment Insurance were randomly assigned to one of two experiments that were designed to speed up the return to work.

UI may prolong jobless spell beyond what it would be in the absence of unemployment benefit:

1. UI benefits may act as subsidy to additional job search
2. UI benefits are also a subsidy to leisure