

PSC 400

SYRACUSE UNIVERSITY

# **DATA ANALYTICS FOR POLITICAL SCIENCE**

**EXTENSIONS TO REGRESSION**

# ASSIGNMENT

- **Problem Set 4 due on Friday**

# EXPERIMENT ANALYSIS

Dear Registered Voter:

## WHAT IF YOUR NEIGHBORS KNEW WHETHER YOU VOTED?

Why do so many people fail to vote? We've been talking about the problem for years, but it only seems to get worse. This year, we're taking a new approach. We're sending this mailing to you and your neighbors to publicize who does and does not vote.

The chart shows the names of some of your neighbors, showing which have voted in the past. After the August 8 election, we intend to mail an updated chart. You and your neighbors will all know who voted and who did not.

## DO YOUR CIVIC DUTY – VOTE!

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MAPLE DR	Aug 04	Nov 04	Aug 06
9995 JOSEPH JAMES SMITH	Voted	Voted	_____
995 JENNIFER KAY SMITH		Voted	_____
9997 RICHARD B JACKSON		Voted	_____
9999 KATHY MARIE JACKSON		Voted	_____

# EXPERIMENT ANALYSIS

- **social.csv**
  - **primary2006**: 1 if voted, 0 if abstained
  - **neighbors**: 1 if received treatment, 0 if not
  - **age**: voter age in years
- **We go back to OLS**
  - What is the treatment effect?

# EXPERIMENT ANALYSIS

- **Turnout = 0.092 + 0.081 \* Treatment + 0.004 \* Age**
- **What's the treatment effect for someone who is 20 years old?**

# EXPERIMENT ANALYSIS

- $\text{Turnout} = 0.092 + 0.081 * \text{Treatment} + 0.004 * \text{Age}$
- What's the treatment effect for someone who is 20 years old?
  - $0.092 + 0.081 * \text{Treatment} + 0.004 * 20$
  - So treatment effect is 0.081

# EXPERIMENT ANALYSIS

- **Turnout = 0.092 + 0.081 \* Treatment + 0.004 \* Age**
- **What's the treatment effect for someone who is 80 years old?**

# EXPERIMENT ANALYSIS

- $\text{Turnout} = 0.092 + 0.081 * \text{Treatment} + 0.004 * \text{Age}$
- What's the treatment effect for someone who is 80 years old?
  - $0.092 + 0.081 * \text{Treatment} + 0.004 * 80$
  - So treatment effect is still 0.081



# EXPERIMENT ANALYSIS

- $\text{Turnout} = 0.092 + 0.081 * \text{Treatment} + 0.004 * \text{Age}$
- Treatment effect is independent of age by assumption
  - Regression gives us independent effects of treatment and age
- Maybe treatment effect is larger among older people?

# EXPERIMENT ANALYSIS

- $\text{Turnout} = 0.098 + 0.050 * \text{Treatment} + 0.004 * \text{Age} + 0.0006 * \text{Treatment} * \text{Age}$ 
  - Interaction effect

# EXPERIMENT ANALYSIS

- **Turnout = 0.098 + 0.050 \* Treatment + 0.004 \* Age + 0.0006 \* Treatment \* Age**
- **What's the treatment effect for someone who is 20 years old?**

# EXPERIMENT ANALYSIS

- $\text{Turnout} = 0.098 + 0.050 * \text{Treatment} + 0.004 * \text{Age} + 0.0006 * \text{Treatment} * \text{Age}$
- What's the treatment effect for someone who is 20 years old?
  - $0.098 + 0.050 * \text{Treatment} + 0.004 * 20 + 0.0006 * \text{Treatment} * 20$

# EXPERIMENT ANALYSIS

- $\text{Turnout} = 0.098 + 0.050 * \text{Treatment} + 0.004 * \text{Age} + 0.0006 * \text{Treatment} * \text{Age}$
- What's the treatment effect for someone who is 20 years old?
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# EXPERIMENT ANALYSIS

- $\text{Turnout} = 0.098 + 0.050 * \text{Treatment} + 0.004 * \text{Age} + 0.0006 * \text{Treatment} * \text{Age}$
- What's the treatment effect for someone who is 20 years old?
  - $0.098 + 0.050 * \text{Treatment} + 0.004 * 20 + 0.0006 * \text{Treatment} * 20$
  - $0.050 + 0.0006 * 20 = 0.062$

# EXPERIMENT ANALYSIS

- **Turnout = 0.098 + 0.050 \* Treatment + 0.004 \* Age + 0.0006 \* Treatment \* Age**
- **What's the treatment effect for someone who is 80 years old?**

# EXPERIMENT ANALYSIS

- $\text{Turnout} = 0.098 + 0.050 * \text{Treatment} + 0.004 * \text{Age} + 0.0006 * \text{Treatment} * \text{Age}$
- What's the treatment effect for someone who is 80 years old?
  - $0.098 + 0.050 * \text{Treatment} + 0.004 * 80 + 0.0006 * \text{Treatment} * 80$



# EXPERIMENT ANALYSIS

- $\text{Turnout} = 0.098 + 0.050 * \text{Treatment} + 0.004 * \text{Age} + 0.0006 * \text{Treatment} * \text{Age}$
- What's the treatment effect for someone who is 80 years old?
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# EXPERIMENT ANALYSIS

- $\text{Turnout} = 0.098 + 0.050 * \text{Treatment} + 0.004 * \text{Age} + 0.0006 * \text{Treatment} * \text{Age}$
- What's the treatment effect for someone who is 20 years old?
  - $0.098 + 0.050 * \text{Treatment} + 0.004 * 80 + 0.0006 * \text{Treatment} * 80$
  - $0.050 + 0.0006 * 80 = 0.098$