

# **Week 1, Class 1**

## **Introduction to Quantitative Political Analysis**

Sean Westwood

### **In Today's Class**

- What is quantitative political analysis and why it matters
- The scientific method in political research
- AI as a partner in data analysis
- Course logistics and expectations
- Getting set up with our computing environment

## An impartial evaluation of me

Nate Silver  @NateSilver538

Unfortunately this offer doesn't apply now because the forecast is so close to 50/50, but always happy to bet for real \$\$\$ against boring academics who can't model for shit and say stuff like that election forecasting is impossible.



From politico.com

12:10 PM · Sep 3, 2024 · 184.2K Views

108 comments 74 retweets 653 likes 56 saves

## Welcome to GOVT 10

This class is about teaching you how to:

1. Think about politics scientifically
2. Work with data
3. Thrive in an AI-dominated future

## Teaching in the Age of AI

**AI has fundamentally changed the world, and we need to work WITH it, not against it.**

Some professors are pretending AI doesn't exist, others are dejected by its rise, but our job is to teach students the skills they actually need.

AI is what you will use in the real world—that is what this class embraces and teaches.

# Using Data to Learn About Politics

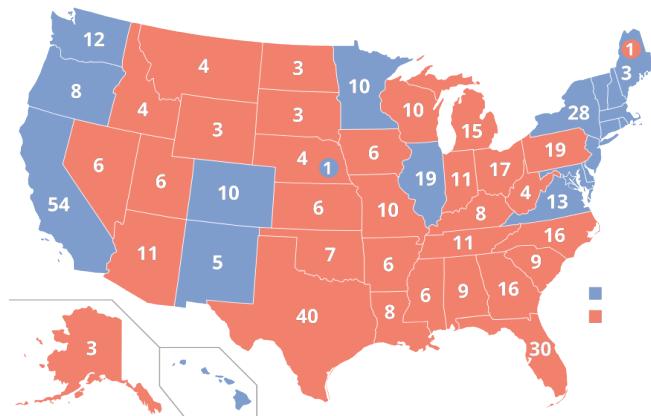


Figure 1: 2024 US Presidential Election Results by State

## Different Views of the Same Election

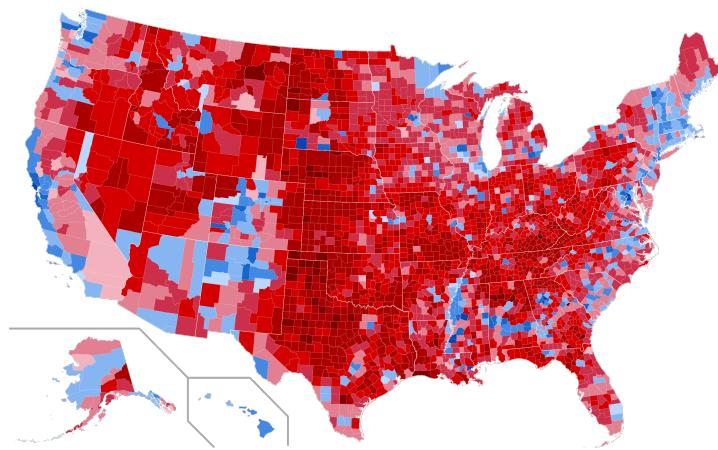


Figure 2: 2024 US Presidential Election Results by County

## Population-Weighted View

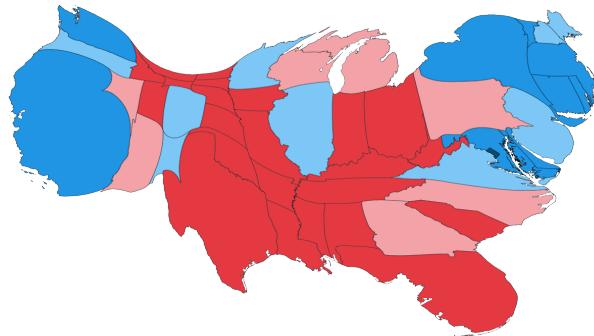


Figure 3: 2024 US Presidential Election Results by Population

## What is “Quantitative” Political Analysis?

**Quantitative political analysis** is the systematic use of numbers, data, and statistical methods to understand political phenomena.

It's how we:

- **Test theories** about how politics works
- **Measure public opinion** accurately
- **Evaluate policies** to see if they actually work
- **Predict election outcomes** and political behavior
- **Make evidence-based decisions** rather than relying on intuition alone

## Why This Matters More Than Ever

### The Data Revolution in Politics

We live in an unprecedented age of political data. Every day, millions of data points are generated about political behavior:

- **Voting records** - Every vote cast by every legislator
- **Campaign finance** - Detailed records of political donations
- **Public opinion polls** - Continuous measurement of citizen attitudes
- **Social media activity** - Real-time political engagement data
- **Election results** - Precinct-level voting patterns

The question isn't whether data shapes politics - it's whether you'll understand how to interpret and use that data responsibly.

## **Informed Citizenship**

Even if you never work in politics professionally, these skills make you a better citizen.

You'll be able to:

- Critically evaluate claims politicians make with “data”
- Understand what polls really mean (and when to be skeptical)
- Recognize misleading statistics in campaign advertising
- Make sense of election forecasts and their uncertainty
- Participate more effectively in democratic discourse

## **Political Science is (Sometimes) a Science**

Some people question whether political science is really “science.” The answer is that it can be - if we follow the same basic scientific method as other disciplines:

### **The Scientific Method in Political Research:**

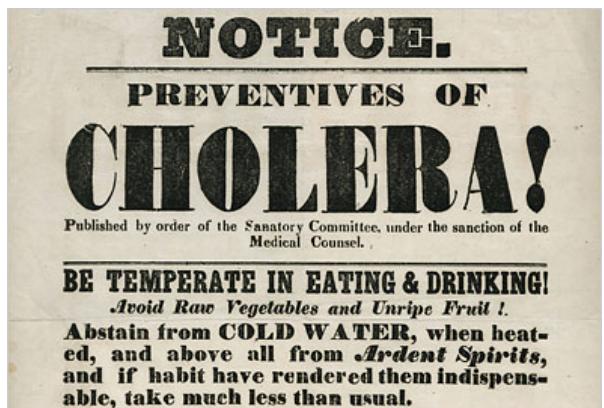
1. **Observe** patterns in political behavior
2. **Hypothesize** about causes and relationships
3. **Test** hypotheses with data and experiments
4. **Replicate** findings across different contexts
5. **Revise** theories based on evidence

For example, political scientists have used this method to discover:

- How voter turnout is affected by election administration
- Which campaign tactics actually persuade voters (most don’t)
- How political institutions shape policy outcomes
- Why some democracies are more stable than others

### **A Historical Example: John Snow**

In 1854, in Soho, London was struck by a severe cholera outbreak that killed over 600 people in just a few weeks. Within just 10 days, over 500 people had died, and panic was spreading through the city.



### The Conventional Wisdom



Most people believed cholera spread through “bad air” or miasma. Medical authorities were convinced that diseases like cholera were caused by polluted air from rotting organic matter.

### Dr. John Snow

Dr. John Snow, a physician and early epidemiologist, challenged the prevailing miasma theory with a radical alternative hypothesis: cholera was transmitted through contaminated water, not airborne particles.

But theoretical disagreement alone was insufficient—Snow needed empirical evidence to overturn established medical doctrine.

The critical question became: how could he systematically test his water-borne transmission theory against the dominant paradigm?

## The Data-Driven Solution

Snow systematically mapped the data.

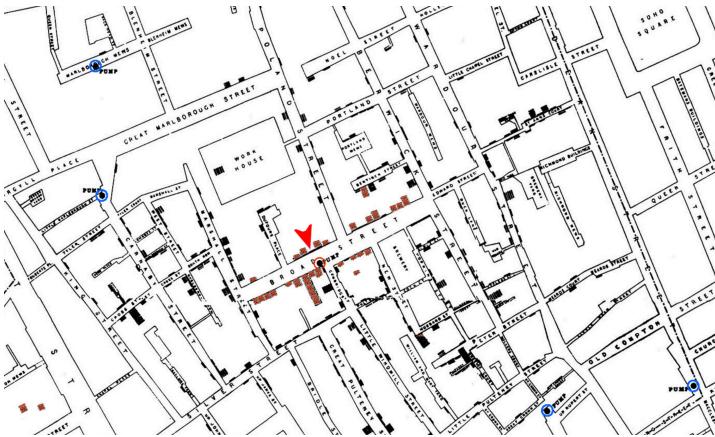
- First he placed a mark on a map for every person who died of cholera



## The Data-Driven Solution

He then:

- Marked the locations of all public water pumps in the area
- Looked for patterns in the data



## What the Data Revealed

Location	Deaths from Cholera	Water Source
Near Broad Street Pump	578	Broad Street Well
Near Rupert Street Pump	12	Different Well
Lion Brewery	0	Private Well
Workhouse	5	Private Well

## Evidence-Based Action

Snow's evidence was so compelling that local authorities agreed to remove the handle from the Broad Street pump.

The cholera outbreak ended shortly thereafter, saving countless lives.

### This is Quantitative Analysis in Action:

- **Systematic data collection** - mapping every death
- **Pattern recognition** - seeing the clustering around one pump
- **Evidence-based conclusions** - water, not air, was the cause
- **Real-world policy impact** - removing the pump handle saved lives

## Our Course Philosophy: AI as Partner, Not Replacement

### The Traditional Approach is Becoming Obsolete

The traditional approach is becoming obsolete:

- Memorizing equations
- Debugging code line by line
- Struggling with programming details

### In 2025, successful data analysts focus on intellectual work:

- Understanding what questions to ask
- Designing appropriate analyses
- Interpreting results correctly
- Communicating findings effectively

## **This Course Reflects That Reality**

**We use AI as a powerful assistant that:**

- Handles the technical implementation
- Allows us to focus on higher-order thinking that no AI can replace

**You'll learn to be sophisticated consumers and creators of quantitative political analysis, equipped with:**

- Technical skills
- Critical thinking abilities

## **Our Focus: Critical Thinking Over Syntax**

**Rather than memorizing programming syntax, we focus on:**

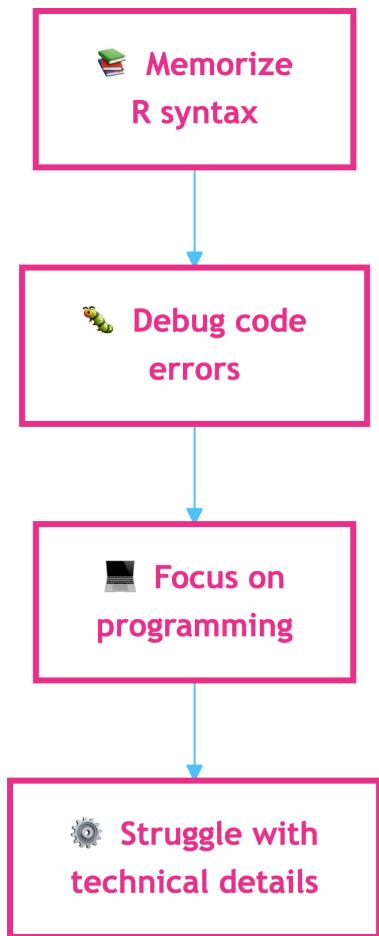
- **Understanding concepts** and their applications to real political problems
- **Interpreting results** and their political implications in context
- **Asking the right questions** and designing appropriate research strategies
- **Verifying logic** and critically evaluating AI suggestions for accuracy and appropriateness
- **Recognizing limitations** of both data and analytical methods
- **Communicating findings** clearly to diverse audiences

## **Why This Approach Matters**

When you graduate and work in political consulting, policy analysis, journalism, or research, you'll **use AI daily**.

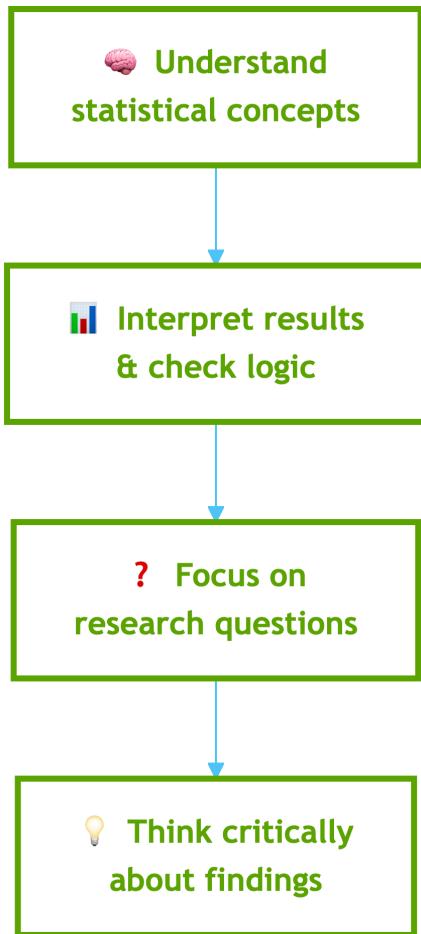
## **Traditional Approach vs. Our Approach**

Traditional Approach



AI enables this shift

Our Approach



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## AI-Assisted Analysis

Instead of spending weeks learning to load data, summarize it, and run a statistical model, you will learn how to get the right answer from AI.

And you will learn how to understand what the AI is doing.

## Common AI Mistakes to Watch For

AI is powerful but not infallible. You'll need to watch out for these common mistakes:

### AI Pitfalls:

- **Correlation Causation:** AI might suggest that correlation implies causation
- **Overfitting:** AI might create overly complex models that don't generalize
- **Missing Context:** AI doesn't understand political or social context
- **Biased Data:** AI can't recognize when data itself is biased or unrepresentative
- **Wrong Methods:** AI might suggest inappropriate statistical techniques
- **Hallucination:** AI might make up data or results that are not real (and lie to you about it!)

## **Your Job: Critical Thinking**

Throughout this course, you'll develop the judgment to:

- Evaluate whether AI suggestions make sense
- Recognize when results are too good to be true
- Understand the limitations of your data and methods
- Ask follow-up questions when something seems off

## **Course Logistics**

### **Assessment & Grading**

#### **Grade Breakdown:**

- **25% Midterm Exam** (closed book, on paper)
- **25% Final Exam** (closed book, on paper)
- **30% Quizzes** (8 total, 10-15 minutes each, weekly starting Week 2)
- **20% Assignments** (weekly submission of class exercises) and **Participation** (engagement in class and attendance)

All exams and quizzes are closed book and conducted on paper

No calculators, computers, or AI assistance during assessments

### **Class Format & Technology Rules**

#### **During Lecture Portions:**

- **Closed computer/no devices** to maintain focus and engagement
- Take notes by hand - research shows it improves learning

#### **During Hands-On Portions:**

- **Laptops required** for coding exercises and AI-assisted analysis
- You'll know when to open them!

## Required Tools & Materials

**Software (All Free/Subscription):**

- **R** (statistical programming language)
- **Positron** (modern IDE optimized for data science)
- **Claude Plus subscription** (AI assistant for coding and analysis)

**Textbook:**

- **None!** I will provide all needed materials
- Everything you need will be on Canvas

## Office Hours & Contact

**Office Hours:** Monday 3:00-5:00 PM EST

**Book Appointments:** link in the syllabus

Don't hesitate to reach out if you're struggling with concepts, coding, or just want to chat about political data!

## Getting Setup

### Our Computing Environment: Positron

We'll be using **Positron**, a modern data science IDE that makes working with R and AI seamless.

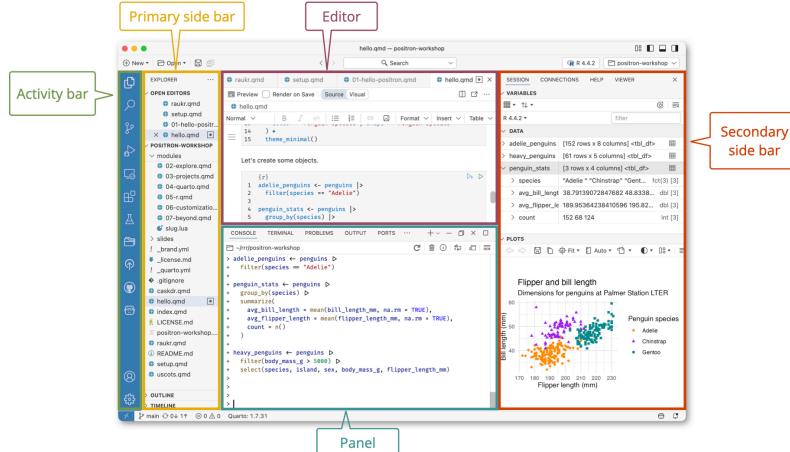


Figure 4: Positron IDE Interface

## In Our Next Class

### Introduction to R and Data Frames

- Basic R operations with variables and vectors
- Creating and examining data frames
- Loading CSV files using `read_csv()`
- Essential tidyverse functions for data exploration
- Your first AI-assisted analysis

### What You'll Be Prepared For

By the end of this course, you will be prepared for careers in:

- **Political consulting** - Using data to guide campaign strategies
- **Policy analysis** - Evaluating government programs and their effectiveness
- **Journalism** - Reporting on politics with statistical literacy
- **Academic research** - Contributing to our understanding of political behavior
- **Any field** where data-driven decision making about human behavior is valued

## Final Thoughts

You'll learn that good quantitative analysis isn't about having all the answers - it's about:

- Asking better questions
- Understanding the limits of what we can know

**Key takeaways:**

- You'll leave this course not just knowing how to analyze political data
- You'll understand how to think scientifically about politics in an era of artificial intelligence