

# Bridging Global Governance, Data Analytics, and Social Equity: My Research and Teaching Contributions to ICI

**Yung-Yu Tsai 蔡咏諭**

Doctoral Candidate

Truman School of Government and Public Affairs  
University of Missouri



# >>>>> Introduction – Who Am I?

## **As A Scholar**

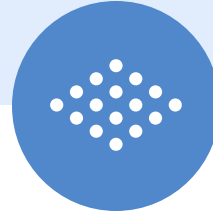
I utilize data-driven methods to examine how government policies and institutional design impact social equity, governance efficiency, and public decision-making.

## **As An Educator**

I foster an inclusive, interactive, and process-oriented learning environment that equips students with critical thinking and problem-solving skills applicable to real-world policy challenges.

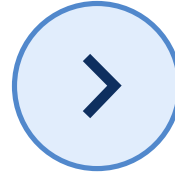
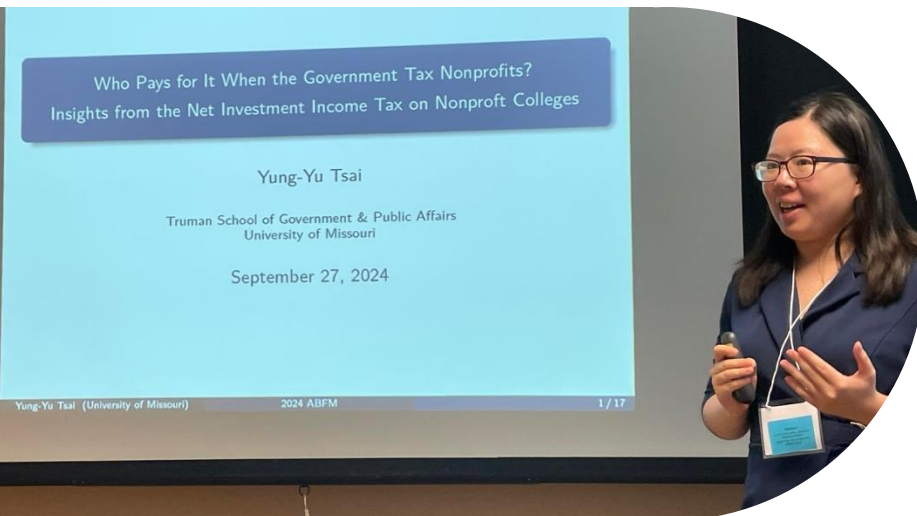
# >>>>> Introduction – Who Am I?

- Ph.D. in Public Affairs (University of Missouri)
  - Defended dissertation in February 2025
  - Expected degree conferred in May 2025
- Interdisciplinary Academic Foundation
  - Political Science, Public Affairs, and Economics
- Teaching and Research Expertise in
  - Public Policy, Public Administration, Social Equity, and Data Analytics



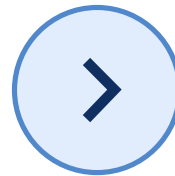
# >>>>> RESEARCH <<<<<

# Research Areas



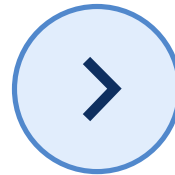
## Government Policy and Social Equity

How do government policies impact social equity?



## Administrative Process in Policy Delivery

How do administrative practices shape governance and service delivery?



## Diversity and Representation in Public and Education Institution

How does institutional diversity shape leadership, citizen, and student outcomes?



# >>>>> Research: A Data-Driven, Interdisciplinary Approach to Policy and Governance

## **Theoretical Foundations**

Sociology, public administration, political science, and economics

## **Methodology**

Causal inference and computational social science  
(e.g., machine learning, big data analysis)

## **Data Sources**

Administrative records, big data (web-scraped & commercial), surveys, and census data

## **Goal**

Generating evidence-based policy recommendations for governments and other governance entities

# Impact of Administrative Burdens on College Enrollment



Economics of Education Review 97 (2023) 102461

Contents lists available at ScienceDirect

Economics of Education Review

journal homepage: [www.elsevier.com/locate/econedurev](http://www.elsevier.com/locate/econedurev)



## The impact of federal administrative burdens on college enrollment

Oded Gurantz<sup>a,\*</sup>, Yung-Yu Tsai<sup>b</sup>

<sup>a</sup> University of Colorado, United States of America

<sup>b</sup> University of Missouri-Columbia, United States of America

### ARTICLE INFO

JEL classification:

I22

I23

I28

Keywords:

Federal Student Aid, Verification,  
Post-secondary Enrollment

### ABSTRACT

Government programs impose eligibility requirements to balance the goals of improving welfare while minimizing waste. We study the impact of eligibility monitoring in the context of Federal Application for Federal Student Aid (FAFSA) submissions, where students may be subject to “verification” requirements that require them to confirm the accuracy of the data. Using a matching on observables design we do not find that students flagged for verification are less likely to enroll in college, which contrasts prior research. Verification reduces grant aid received but average changes are small, raising questions about the benefits of this administrative process.

## Theory Foundation

Administrative Burden  
(Sociology, Political Science)

## Data Source

California Government  
Administrative Records

## Methodology

Machine learning, Matching,  
RD design

## Policy Implication

Policy recommendations for  
process simplification



# Impact of Teacher Favoritism On Student Outcomes

## Theory Foundation

Implicit Bias (Sociology,  
Behavioral Economics)

## Data Source

Longitudinal survey  
(Taiwan Youth Project)

## Methodology

Quasi-experiment  
(randomized within-school)

## Policy Implication

Institutional policies for  
teacher recruiting and training

Journal of Behavioral and Experimental Economics 101 (2022) 101941



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Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Journal of Behavioral and Experimental Economics

journal homepage: [www.elsevier.com/locate/jbee](https://www.elsevier.com/locate/jbee)



Does undue preference lead to unfairness? The impact of teacher favoritism on teacher treatment and student achievement

Yung-Yu Tsai

*Truman School of Government and Public Affairs, University of Missouri, United States*

### ARTICLE INFO

JEL codes:

J15

J16

I24

Keywords:

Teacher favoritism

### ABSTRACT

This study investigates the impact of teacher favoritism (i.e., systematically favoring students of a specific gender, ethnicity, or high previous class ranking) on teacher treatment and student achievement. Based on the practice of random class grouping within schools, a school fixed effect model is used to estimate the causal effect of teacher favoritism. The results suggest that teacher favoritism toward students with a higher previous class rank increases the likelihood of these students consulting with their teacher on academic, emotional, and friendship issues. Also, female students are more likely to discuss friendships and emotional matters with pro-





# Voluntary Responses During COVID-19 Pandemic

PLOS ONE

RESEARCH ARTICLE

## Measuring voluntary responses in healthcare utilization during the COVID-19 pandemic: Evidence from Taiwan

Yung-Yu Tsai<sup>1</sup>\*, Tzu-Ting Yang<sup>2</sup>✉

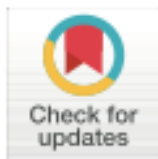
<sup>1</sup> Truman School of Government and Public Affairs, University of Missouri, Columbia, MO, United States of America, <sup>2</sup> Institute of Economics, Academia Sinica, Taipei, Taiwan

✉ These authors contributed equally to this work.

\* [ttyang@econ.sinica.edu.tw](mailto:ttyang@econ.sinica.edu.tw)

### Abstract

Healthcare has been one of the most affected sectors during the coronavirus disease 2019 (COVID-19) pandemic. The utilization of related services for non-COVID-19 diseases fell



### Theory Foundation

Behavioral Economics & Epidemiology

### Data Source

National Health Insurance & Google search data

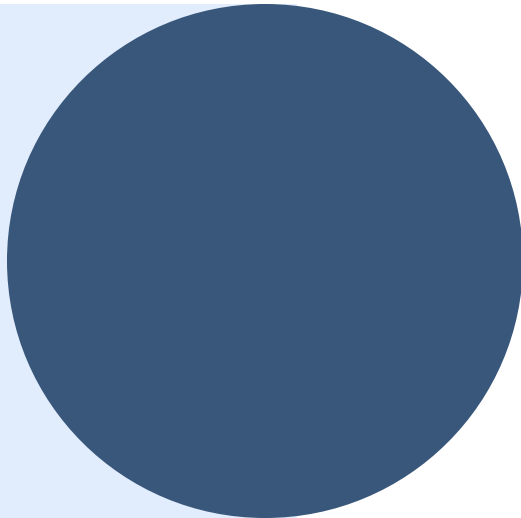
### Methodology

Econometrics (Difference-in-Differences)

### Policy Implication

Informing public health communication strategies

# Future Research Agenda



## Government Policy and Social Equity

How do government policies impact social equity?



## Administrative Process in Policy Delivery

How do administrative practices shape governance and service delivery?



## Diversity and Representation in Public and Education Institution

How does institutional diversity shape leadership, citizen, and student outcomes?

# >>>>> Research Theme 1

## Government Policy and Social Equity

- **Question:** How do government policies impact social equity?
- **Example Research**
  - Nonprofit Taxation: How does taxing wealthy nonprofits affect public good provision and access?
  - Taxation Fairness and Housing Justice: How does equity tax reform affect housing justice and wealth inequity?
  - Equity Contracting in Government Procurement: How do policies prioritize disadvantaged firms in government procurement affect social outcomes?
- **Contribution to ICI**
  - Applying data analytics (DA) techniques in governance (GG) research

# >>>>> Research Theme 2

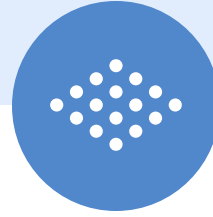
## Administrative Process in Policy Delivery

- **Question:** How do administrative practices shape governance and service delivery?
- **Example Research**
  - Administrative Burden: How do burdens in financial aid, funding process, and government contracting affect program effectiveness
  - Informational Signal in Policy Delivery: How do information signals sent out in policy delivery influence citizen behavior
- **Contribution to ICI**
  - Equipping students with practical governance and policy evaluation skills

# >>>>> Research Theme 3

## Diversity and Representation

- **Question:** How does institutional diversity shape leadership, citizen, and student outcomes?
- **Example Research**
  - Benefit of Representation: Do advantages come from “identity” or “experience?”
  - Burden of Representation: The burden of minority leaders to “represent” their social groups
  - Challenges and Solutions to Improve Diversity and Representation: How do universities utilize their student body to improve student experience, given the limitations in diversity of faculty backgrounds?
- **Contribution to ICI**
  - Social sustainability & inclusive governance focus
  - Informing institutional design, leadership, and diversity strategies



# TEACHING





# >>>>> Teaching Experience

## **Instructor of Record**

- State Government (Introduction to Political Science)
- Public Policy Analysis

## **Guest Lecturer and Teaching Assistant**

- Public Policy and Administration
- Public and Nonprofit Management
- American Government and State Government
- Research Methods

## **Workshop Speaker**

- Stata, R, GIS

# >>>>> Teaching Training

## **Courses Completed**

- Truman School Teaching Training Seminar
- Communication and Culture for American College Teaching
- Instructional and Communication Strategies for Effective College Teaching

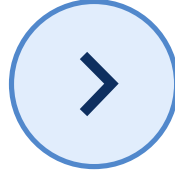
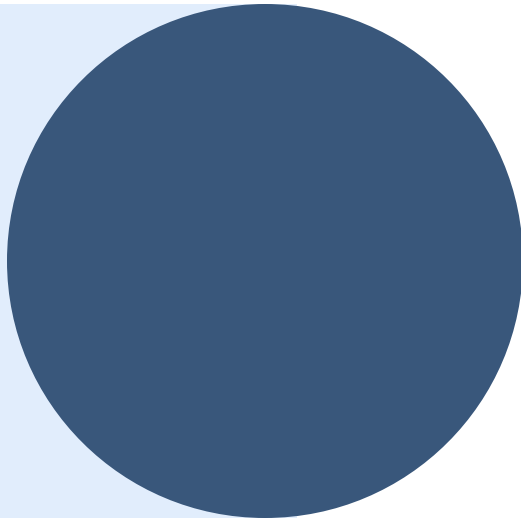
## **Certification**

- Online Teaching Certification (University of Missouri)

## **Workshops Participation**

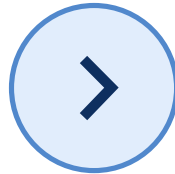
- Teaching with Generative Artificial Intelligence
- Leveraging Active Learning to Deepen Student Learning
- Dealing with Academic Dishonesty in Classroom

# Teaching Philosophy



## Self-Directed Learning

Empower students to think critically and solve problems independently



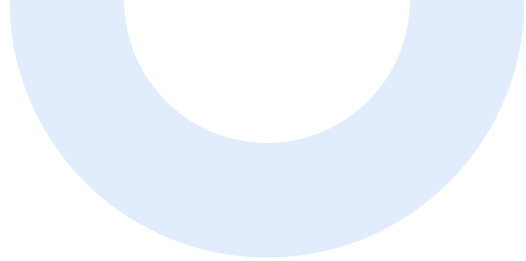
## Process-oriented Pedagogy

Emphasize learning through step-by-step reasoning and practice.



## Active and Inclusive Engagement

Create an inclusive, interactive, and globally aware classroom



# Teaching Philosophy 1

## Self-Directed Learning



**Prioritizing  
adaptable problem-  
solving skills**



**Encouraging  
independent and  
analytical thinking**




**Helping students  
take ownership of  
learning**

“I liked the activities you had us do when we met in groups and came up with a solution to a hypothetical scenario”  
— Student Evaluation from State Government (2023 Fall)

“Yung-Yu is great with availability, she also encourages you to think through concepts or try a different approach or way of thinking so you learn.” — Research Method (2023 Spring)



# Are you afraid of Stata errors?



**Karolina Brodin**  
Join Date: Feb 2018  
Posts: 1

**Error r(111)**  
19 Feb 2018, 18:12

Hi,

I just started to learn Stata today and I can't get my do.file to run.

I am trying to run [http://masteringmetrics.com/wp-content...9\\_hicompare.do](http://masteringmetrics.com/wp-content/uploads/2018/02/hicompare.do) and I get the error code r(111):



**Eva Brown**  
Join Date: Apr 2018  
Posts: 2

**1 group found, 2 required r(420); Error**  
27 Apr 2018, 16:13

Hi Everyone,

I'm running a lot of ttests and I keep getting this error whenever there are code:

```
foreach region in list {
  bysort ethnicity: ttest meanscore, by(survey)
  bysort personofcolor: ttest meanscore, by(survey)
  bysort gender: ttest meanscore, by(survey)
  bysort cgp: ttest meanscore, by(survey)
  bysort economicbackground: ttest meanscore, by(survey)
}
```



**Shilpi Mukherjee**  
Join Date: Jun 2018  
Posts: 1

**Error r(100) - Varlist Required**  
24 Jun 2018, 19:29

Hello,

I am fairly new to Stata and am trying to write a code to understand the sequence of flights. My code is

```
set obs 509519
local count = 1
local slno = 1
gen sequence = _n
forval slno = 1(1)509517{
  replace `sequence' = `count' in `slno'
  while ((flightnum[ `slno' ] == flightnum[ `slno' + 1 ]) && (tailnum[ `slno' ] == tailnum[ `slno'+1 ])){
    replace `sequence' = `count' in `slno'
    replace `count' = `count' + 1
    replace `slno' = `slno' + 1
  }
}
```

## Outline

- 1 Error vs. Warning: Why do we need to care about error?
- 2 Understanding: What do error messages and help files say?
- 3 Debugging: What if there are no clear error messages?
- 4 Handling: What if the errors are inevitable?
- 5 Fixing: What if the errors come from the author of the command?



Group number	1
Group members	
Assigned state	Illinois
Political culture	Individualistic

Voting registration deadline	16 days before Election Day
Absentee voting or vote by mail allowed?	absentee voting by mail is allowed, but last d
Turnout rate at the 2020 General Election	A democratic vote favored 72.92%; 20 electo
Are different languages available on the website?	No
How long does it take to find the information?	10 min


Group number	7
Group members	
Assigned state	California
Political culture	Moralistic
Voting registration deadline	February 20, 2024
Absentee voting or vote by mail allowed?	Yes, voting by mail and absentee voting is allowed.
Turnout rate at the 2020 General Election	17,785,151; 80.67% turnout registered, 70.88% turnout eligible <a href="#">source</a>
Are different languages available on the website?	Yes, available in Spanish, Chinese, Hindi, Japanese, Khmer, Korean, Tagalog, Thai or Vietnamese
How long does it take to find the information?	Quite easy to find the information, did not take long, maybe a couple of minutes.





# Teaching Philosophy 2


## Process-Oriented Pedagogy



**Emphasizing step-by-step learning and improvement**



**Design course activities to observe thinking process**



**Providing detailed feedback for student growth**

“The set of assignments through the course have induced a need and desire for thorough understanding of a topic of our own interest and choosing. Each assignment builds from a foundation established by the previous assignment instead of each assignment more relating to just the current week’s material.”

— Student Evaluation from Public Policy Analysis (2024 Fall)

“She is very interactive and supportive of students’ efforts by providing uncompromising and specific feedback that provides students with a clear vision to the path of improvement.” — Student Evaluation from Public Policy Analysis (2024 Fall)

Check In #4  
Due: May 7, 2023 at 11:59pm - PUB\_AF-8181-01-54691-2023SP-RSC MTH & INQ PBLC AFF 2

18/19  
Graded

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Part 2. Multivariate regression results

(5 points) Create a table showing the results of your multivariate regression (refer to the lecture material for guidance and examples)

Table 2. OLS Regression predicting feelings towards Joe Biden in the run-up to the 2020 election	Coefficient (std error)
Gun Ownership	-1.00 (.09)
Sex ( male was reference category) Female	5.39 (.96)
Guns	1.58 (5.2)
LGBTQ+ Yes	21.83(3.0)
Tucker Carlson Tonight Viewer (No was reference category) Yes	6.86 (1.34)

Data Source: National Election Survey 2020  
Sample Size: 5,349

(5 points) Discuss the statistical and substantive interpretation for each of the independent variables in your regression model.

- Sex: Our p value was less than .05 which indicates a good fit. Females, on average rated Biden 5.05 points higher than males.
- Guns: Our P values were less than .05 which indicates a good fit. Gun owners, on average rated Biden 1 point lower than non gun owners.
- LGBT: Our p value was less than .05 which indicates good fit. LGBTQ+ respondents rated Biden 21.83 points higher than heterosexual respondents.
- Tucker: Our p value was less than .05 which indicates good fit. Tucker Carlson tonight viewers rated Biden 6.86 points higher than non-viewers.

Part 3. Conclusions and next steps

(4 points) Based on your research question and brief literature review, what have you learned from your analysis?

- There were a few surprising results. First, gun owners and Biden the data because it was having a positive relationship. I

Yung-Yu Tsai

I think you table results have some problem. The result I get is different from yours. Feel free to show me your code and Stata output. and I can

Yung-Yu Tsai

For all the coefficients we may want to use star annotation to label significance. You can use \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Yung-Yu Tsai

Did you include both the number of guns and gun ownership in the regression? It is fine. But the interpretation would change (which would be

Yung-Yu Tsai

Even we do not interpret constant (intercept), you still need to put it in the table.

1 Reply

Yung-Yu Tsai

The coefficient you cite here is different from the table you report (also different from the result I got from my side). Where do you get these results?

Yung-Yu Tsai

Since you include both "numbers of guns" and "gun owners" in the regression, the interpretation here

Policy Analysis Project (2): Alternatives Evaluation  
Due: Multiple Due Dates - PUB\_AF-4430-02-64226-2024FS-PUBLIC POLICY ANALYSIS

20/21  
Graded

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The problem of foreign aid being misused is a problem that effects every American and there must be solutions or else the citizens money will continue to be wasted. There can be many possible approaches to this issue and one alternative would be to do nothing and let this continue unchecked. This option would have the most feasibility due to there being no change required. By not changing and continuing to allow this current practice of foreign aid accountability to remain it reaches no solution to the problem facing this country. This lack of action would have no effectiveness in combating the possible fraudulent use and disregard for accountability of taxpayer's dollars. Also, this proposed policy alternative would have no adverse cost because keeping the status quo neither costs nor saves any money, since the relevant actions remain the same and so would the cost.

Another policy alternative that would be worth considering is stopping all foreign aid completely. This could in theory be achieved with little to no effort from our legislative bodies, but in practice that would be a different story because as we have seen the massive back and forth between how much foreign aid to send to certain places in previous years. In reality, the feasibility of this alternative would be almost impossible because the vast majority of our legislature would have to agree that no foreign aid is the best solution. This would be a monumental foreign relation policy shift towards isolationism, that hasn't been seen in the United States since before World War II (Office of the Historian). Another consideration to this policy is the cost, though it would save the United States Billions of dollars, allowing us to solve most domestic problems with ease, the potential for strained international relations is immense, the US utilizes aid not just to be a kind neighbor but to secure loyalty and prevent other hostile nations to influence the country receiving the aid. The effectiveness of this policy would be absolute, by not giving away any money then we have stopped all foreign aid. Though the end goal of no more foreign ad would be accomplished the foreign relations and geopolitical ramifications would be mighty.

The third option would be for Congress to pass a law requiring the monitoring of foreign aid once it has left the United States. This could be done relatively simply if our legislative bodies set forth laws that would make sure foreign aid is spent on what it was intended for. The US has already made efforts in transparency for foreign aid in the Foreign Aid Transparency and Accountability Act in 2016. This act required the monitoring, evaluation and reporting to the American public to increase transparency of how much money is being given to foreign countries and for what purpose (Foreign Assistance). If put into practice this policy would be dependent on the countries to show that the money was spent honestly. This could be problematic, due to countries'

Yung-Yu Tsai

The status quo doesn't necessarily mean "doing nothing." In current practice, the government could still decide to discontinue future aid, or use diplomatic approaches for

Yung-Yu Tsai

You used three criteria to evaluate the alternatives, but you didn't define or explain these terms. Additionally, there's no justification for why you chose these criteria. Providing bri

Yung-Yu Tsai

Is the Foreign Aid Transparency and Accountability Act the "status quo"? Does it overlap with your first alternative, or is it exclusive to the third alternative? Clarifying this w

Yung-Yu Tsai

You mention "if put into practice"—does this imply the act is not yet in effect? My understanding is that it has been passed and is already operational. Clarifying this would

Homework #6  
Due: Apr 30, 2023 at 11:59pm - PUB\_AF-8181-01-54691-2023SP-RSC MTH & INQ PBLC AFF 2

18/19  
Graded

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negative relationships.

3. (2 points) Provide a statistical and substantive interpretation of the odds ratios for age and for relig.

Logistic regression

Log likelihood = -332.41547

Number of obs = 601  
LR chi2(2) = 38.35  
Prob > chi2 = 0.0001  
Pseudo R2 = 0.0356

affairs	Odds ratio	Std. err.	z	P> z	[95% conf. interval]
age	.993939	.0182383	-8.59	0.000	.9740717 1.014222
relig	.7601529	.0632886	-3.18	0.001	.6545705 .9078137
_cons	.896755	.3879047	-8.25	0.000	.3848348 2.093986

Note: \_cons estimates baseline odds.

Logistic regression

Log likelihood = -337.58419

Number of obs = 601  
LR chi2(1) = 8.19  
Prob > chi2 = 0.0162  
Pseudo R2 = 0.0083

affairs	Odds ratio	Std. err.	z	P> z	[95% conf. interval]
age	.9955733	.0182083	-8.43	0.000	.9757411 1.015784
_cons	.8848199	.3222318	-2.78	0.005	.1955485 .7541427

Note: \_cons estimates baseline odds.

Commented [DR1]: What's not clear from the presentations is whether these logistical regressions are supposed to be run with all variables or — as the question suggests — just these two variables or individually. I've included all regressions to demonstrate ability to run.

Yung-Yu Tsai

Yes, you only need to interpret the results from question 1. You do not need to re-run a regression.

21



# Teaching Philosophy 3

## Active and Inclusive Engagement



**Creating an interactive  
and inclusive learning  
environment**



**Encouraging global  
and interdisciplinary  
perspectives**



**Providing  
personalized  
support for students**

“Your effort does not go unnoticed and I applaud your creativity in the class activities, as well as all the effort you would put into making the class interesting, productive, and yet not stressful.”

— Student Evaluation from State Government (2023 Fall)

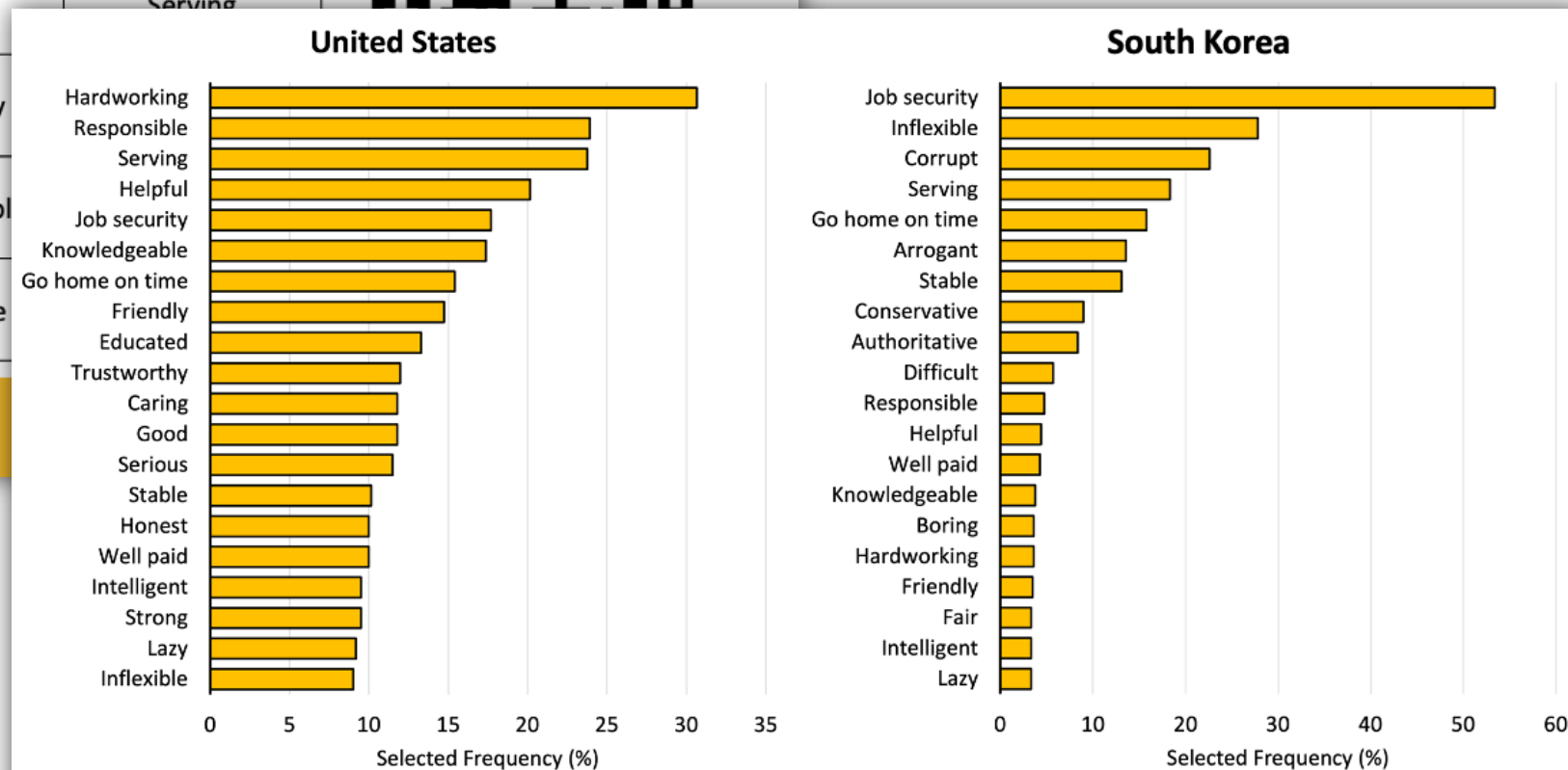
“Your words of encouragement really do help when students like me are struggling or frustrated. This course has been rather difficult but your willingness and patience has made the difference.”

— Student Evaluation from Research Methods (2023 Spring)



## Which Keywords Come to Your Mind When Think about Public Workers / Civil Servants?

Arrogant	Difficult	Helpful	Serious
Authoritative	Educated	Inflexible	Serving
Caring	Friendly	Job security	
Conservative	Go home on time	Knowledgeable	
Corrupt	Hardworking	Responsible	





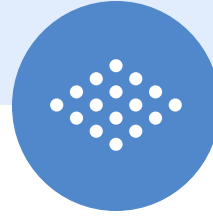
# >>>>> Course Offerings & Development

## **Core Courses**

- Political Science (GG)
- Public Administration (GG)
- Global Health Governance (GG)
- Data Science & Big Data (DA)

## **Elective Courses**

- Public Policy: Policy Innovation, Analysis, and Advocacy (GG)
- Social Policy in Asia and Global Setting (GG & SS)
- Governance and Social Equity (GG & SS)
- Policy Trade-Offs in Global Governance (GG & SS)
- Causal Inference in Social Science (DA)



# SUMMARY





# >>>>> Summary – Why ICI? Why Me?

## **Strong Alignment with ICI's Mission**

- Research connects governance, data analytics, and social equity
- Apply policy-relevant research to real-world governance challenges

## **Expertise in Interdisciplinary Research & Teaching**

- Bridging policy, data science, and social sustainability across ICI's tracks
- Using various methods to equip students with analytical skills

## **Commitment to Student Engagement & Institutional Development**

- Interactive, inclusive, and process-driven teaching for global challenges
- Research expertise in institutional policy supports program and diversity and inclusion in education setting

# >>>>> My Contribution to ICI



## Global Governance (GG)

- Academic foundation in public administration, political science, and public policy
- Research focuses on policy evaluation and governance effectiveness
- Experience collaborating with government agencies to inform policy decisions



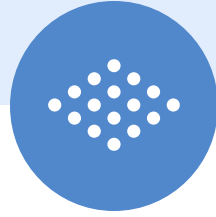
## Data Analytics (DA)

- Expertise in econometrics, causal inference, GIS, and computational social science
- Research using administrative data and big data
- Applying data-driven insights to policymaking



## Sustainability & Society (SS)

- Research on social equity, diversity & inclusion, and social mobility
- Teaching fosters inclusion and real-world application
- Empowering students as active global citizens



**THANK  
YOU!**

