Culture, Policy Obedience, and Virus Spread: Evidence from Anti-COVID Efforts in the United States

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Motivation

▶ To control the spread of the virus, each state issued its own shelter-in-place orders; however, these impacts vary by state (Feyman et al., 2020; Dave et al., 2021)

▶ It is essential for policymakers to understand what contributes to heterogeneous policy efficacy

▶ Explain the heterogeneity in policy efficacy from an individualistic culture perspective

Research Questions

1. How does individualism-collectivism influence anti-COVID-19 policy compliance?
2. How do these cultural impacts affect the effects of anti-COVID-19 policy on preventing coronavirus spread?
3. What is the social cost associated with the individualistic culture?

Contributions

1. Adopting a **policy index** that better reflects the state government policy effort in curbing the virus over time
2. Rich **mobility measures** and **health outcomes** from distinct sources
3. Three different measures of **individualism**

Data

1. County-Level Cultural Context (Individualism)
2. State-Level Anti-COVID Policies
3. County-Level Social Distancing and Mobility Outcomes
4. Virus Prevalence and Health-Related Outcomes

Individualism

Individualism may undermine policy efficacy for the following reasons:

- ▶ Less trust in science (Bazzi et al. 2021)
- ▶ More risk-taking behaviors (Germani et al., 2020; Li et al., 2013),
- ▶ Less sense of social responsibility (Bian et al., 2020; Bazzi et al., 2021),
- ▶ Less willingness to wear masks or maintain social distance (Bian et al., 2020; Bazzi et al, 2020; Frey et al., 2020; Chen et al., 2021; Lu et al., 2021).

Individualism

Measures of individualism:

1. Composite Individualism Index
2. Total Frontier Experience
3. Asian Culture

Measures of Individualism

Composite individualism index (CII)

$$CII_c = \sum_k IndividualisticScore_k \times Population_{ck}. \tag{1}$$

▶ A sum of the individualistic cultural values of the country of origin provided by Hofstede (2001) weighted by the immigrant population in each county using the 1980 U.S. census

Measures of Individualism

▶ The immigrants were American history (Handli, 2002).

▶ Measures of Individualism from Two Historical Immigrant Influxes in the U.S.

  1. Westward Movement of the European Settlers from 1790 to 1890
  2. The first major wave of Asian immigrants from 1850 to 1917

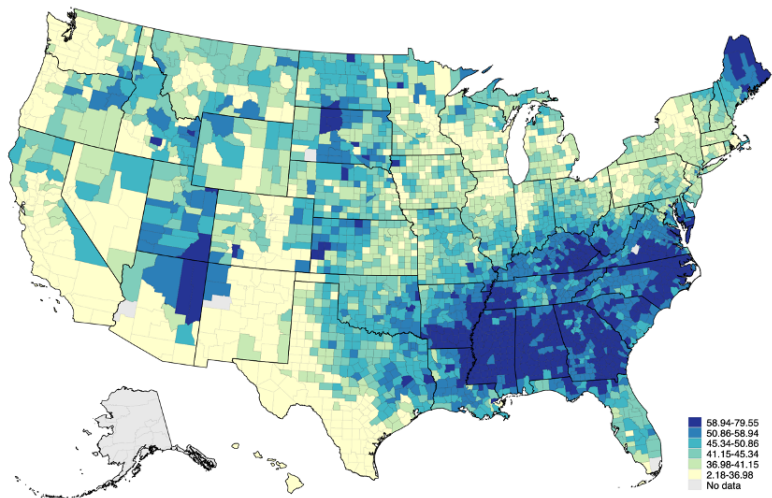# Measures of Individualism from Two Historical Immigrant Influxes in the U.S.

Total Frontier Experience (TFE)

▶ The TFE is the unit of years at the edge of free land fostered individualism and antipathy to government interventions
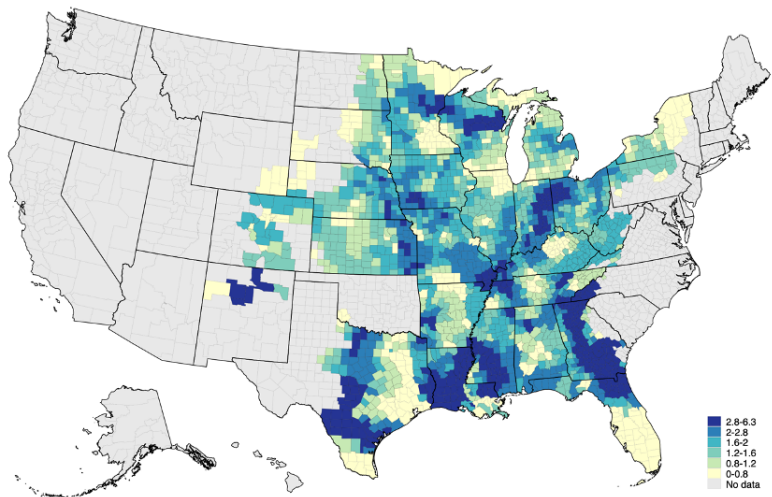
▶ A long TFE is indicative of great individualism.

Asian Culture

▶ A binary variable indicating whether there were Asian immigrants in 1910, obtained from the 1910 U.S. census, to attain the effect of inherited cultural values from Asian immigrants.

Composite Individualism Index (CII)

Legend:
- 58.94–79.55
- 50.86–58.94
- 45.34–50.86
- 41.15–45.34
- 36.98–41.15
- 2.18–36.98
- No data

Total Frontier Experience (TFE)

■	2.8-6.3
■	2-2.8
■	1.6-2
■	1.2-1.6
■	0.8-1.2
■	0-0.8
■	No data

Share of Asian Immigrants in 1910

Legend:
- 0.04–0.11
- 0.03–0.04
- 0.02–0.03
- 0.01–0.02
- 0.0000001–0.01
- 0
- No data
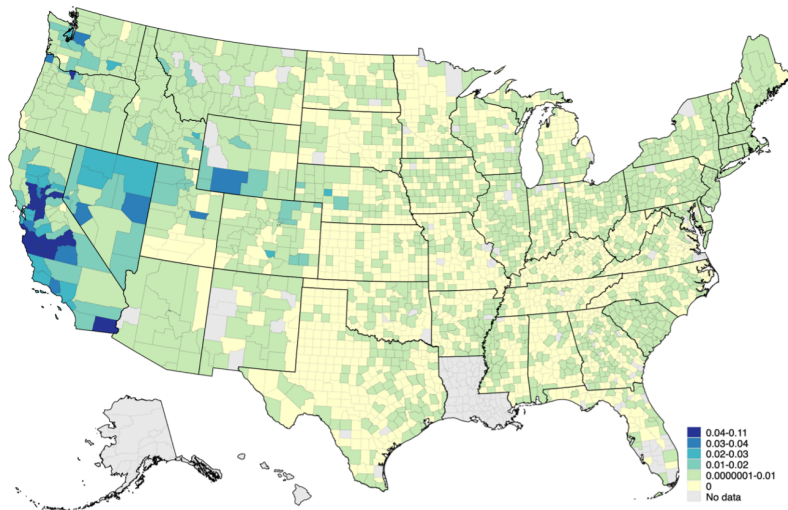
State-Level Anti-COVID Policies

▶ Source: The Oxford COVID-19 Government Response Tracker (OxCGRT)

▶ The containment and health index

▶ Varies by state and over time, within a range from 0 (loosest) to 100 (strictest)

County-Level Social Distancing and Mobility Outcomes

1. Google Community Mobility Report
   - ▶ Residential, workplaces, transit stations, grocery and pharmacy
2. SafeGraph
   - ▶ Daily mobility using anonymized location data from mobile phones
   - ▶ Fraction of mobile devices that did not leave the immediate area of their home
3. The COVID-19 Impact Analysis Platform by the University of Maryland
   - ▶ County-level information on the social distancing index,
   - ▶ Percentage of residents staying at home,
   - ▶ The miles traveled on all transportation modes per person per day,
   - ▶ The percentage of all trips that cross county borders

Virus Prevalence and Health-Related Outcomes

- ▶ Daily virus reproduction number (Rt)
  - ▶ Estimated by Ma et al. (2021) for 2,669 U.S. counties from March 15 to December 31, 2020.
  - ▶ Rt is defined as the average number of new infections caused by a single infected person
- ▶ Polymerase chain reaction (PCR)-positive rate.
  - ▶ The PCR-positive rate is extracted from COVID Act Now (CAN).
  - ▶ The number of positive PCR tests over the last 7 days divided by the total number of PCR tests over the last 7 days

Empirical Model

$$y_{c,s,t} = \beta_0 + \beta_1 Individualism_{c,s} \times Policy_{s,t-m} + \beta_2 Policy_{s,t-m} \atop + \beta_3 X_{c,s,t} + \gamma_{c,s} + \theta_t + \varepsilon_{c,s,t}, \quad (2)$$

- ▶ c: county, s: state, t: day
- ▶ $y_{c,s,t}$: a county-level measure of social distancing or health outcomes relevant to COVID-19
- ▶ $Individualism_{c,s}$: indicative of the culture environment measured by the individualism
- ▶ $Policy_{s,t-m}$: the containment and health index, ranging from 0, the loosest policy, to 100, the strictest policy.
  - ▶ social distancing outcomes: the contemporary policy response, i.e., m=0
  - ▶ health-related outcomes: the policy response two weeks ago, i.e, m=14

Empirical Model

- $X_{c,s,t}$:
  - the share of non-Hispanic whites in the county
  - the share of the population with less than high school education in the county
  - the share of the population under 18 years old in the county
  - whether the Republican won this state in the 2016 presidential election
- $\gamma_{c,s}$ and θ_t are county fixed effects and calendar day fixed effects
- $\varepsilon_{c,s,t}$ is the error term
- Standard errors are clustered at the state level to capture the correlations within states

Table 2: Impacts on Staying-at-Home Behaviors

A. Percentage Changes in Visits to Residential		
Containment Health Index	0.0601**	0.169**
	(0.0137)	(0.0207)
CII × Containment Health Index		-0.00230**
		(0.000326)
B. Fraction of Mobile Devices that		
Did Not Leave the Immediate Area of Their Home		
Containment Health Index	0.0342**	0.153**
	(0.0145)	(0.0307)
CII × Containment Health Index		-0.00238**
		(0.000424)
C. Percent of Residents Staying at Home		
Containment Health Index	0.0426**	0.112**
	(0.0144)	(0.0208)
CII × Containment Health Index		-0.00139**
		(0.000275)

Table 4: Impacts on Miscellaneous Social Distancing Behaviors

A. Social Distancing Index

Containment Health Index	0.102**	0.245**
	(0.0306)	(0.0438)
CII × Containment Health Index		-0.00286**
		(0.000588)

B. Miles per Person

Containment Health Index	-0.0493**	-0.181**
	(0.0205)	(0.0276)
CII × Containment Health Index		0.00265**
		(0.000352)

C. Percentage of All Trips that Cross County Borders

Containment Health Index	-0.0410**	-0.0623**
	(0.0158)	(0.0178)
CII × Containment Health Index		0.000427*
		(0.000225)

D. Percentage Changes in Visits to Workplaces

Containment Health Index	-0.0805**	-0.298**
	(0.0299)	(0.0733)
CII × Containment Health Index		0.00434**
		(0.000899)

E. Percentage Changes in Visits to Transit Stations

Containment Health Index	-0.229**	-0.549**
	(0.0606)	(0.0771)
CII × Containment Health Index		0.00689**
		(0.00135)

F. Percentage Changes in Visits to Grocery Stores

Containment Health Index	-0.152**	-0.427**
	(0.0422)	(0.0623)
CII × Containment Health Index		0.00574**
		(0.000851)

Table 5: Impacts on Virus Spread

A. Disease Virus Reproduction Rate		
Containment Health Index	-0.00247**	-0.00747**
	(0.00106)	(0.00259)
CII × Containment Health Index		0.0000994**
		(0.0000440)
B. PCR-Positive Rate		
Containment Health Index	-0.036	-0.228**
	(0.0378)	(0.0660)
CII × Containment Health Index		0.00385**
		(0.00128)

Table 6: Evidence from Two Historical Immigrant Influxes

A. Percent of Residents Staying at Home		
Containment Health Index	0.0601**	0.0311**
	(0.0192)	(0.0136)
TFE × Containment Health Index	-0.00616**	
	(0.00244)	
Asian in 1910 × Containment Health Index		0.0256**
		(0.00681)
B. Disease Virus Reproduction Rate		
Containment Health Index	-0.00357**	-0.00747**
	(0.00148)	(0.00259)
TFE × Containment Health Index	0.000785*	
	(0.000427)	
Asian in 1910 × Containment Health Index		-0.00477**
		(0.000824)
C. PCR-Positive Rate		
Containment Health Index	-0.104**	-0.0257
	(0.0491)	(0.0374)
TFE × Containment Health Index	0.0236**	
	(0.00834)	
Asian in 1910 × Containment Health Index		-0.0480**
		(0.0143)

Policy Implication

The conflict of short-term self-interest and long-term collective interest can be mitigated from the following two aspects:

1. The government may consider taking different actions according to the level of individualism in each community
   - ▶ Collectivism—promote cooperation within groups and inform people the social gains of obeying those anti-COVID policies.
   - ▶ Individualism—frame the relevant interventions to appeal to individuals own self interests.
2. Convey information from trustworthy sources and build trust in science among the public.
   - ▶ Fake news and incorrect information about COVID could undermine anti-COVID policies more prominently in a more individualistic context, as people in such contexts show less trust in science and government

Conclusion

1. Individualism in the U.S. tends to hinder the implementation of anti-COVID policies.

2. The policy effects are weaker in a stronger individualistic cultural context.

3. Highlight the important contribution of Asian immigrants in the battle against the COVID-19 pandemic.

4. The lesson we learn has applications going beyond COVID, as individualism is likely to affect compliance with all sorts of government policies.

Thank you for listening!

The full paper is available at SSRN:
https://ssrn.com/abstract=4097271