

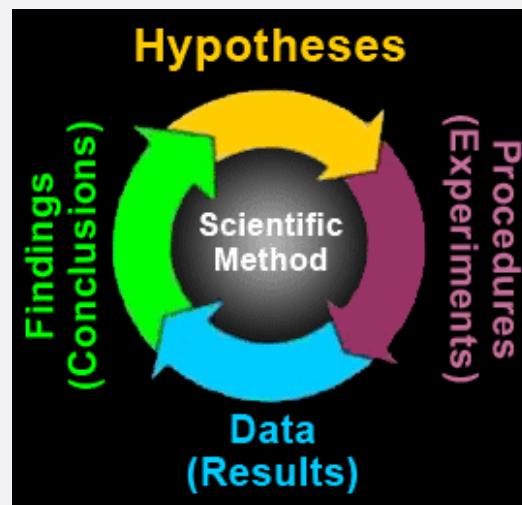
PSC 202

SYRACUSE UNIVERSITY

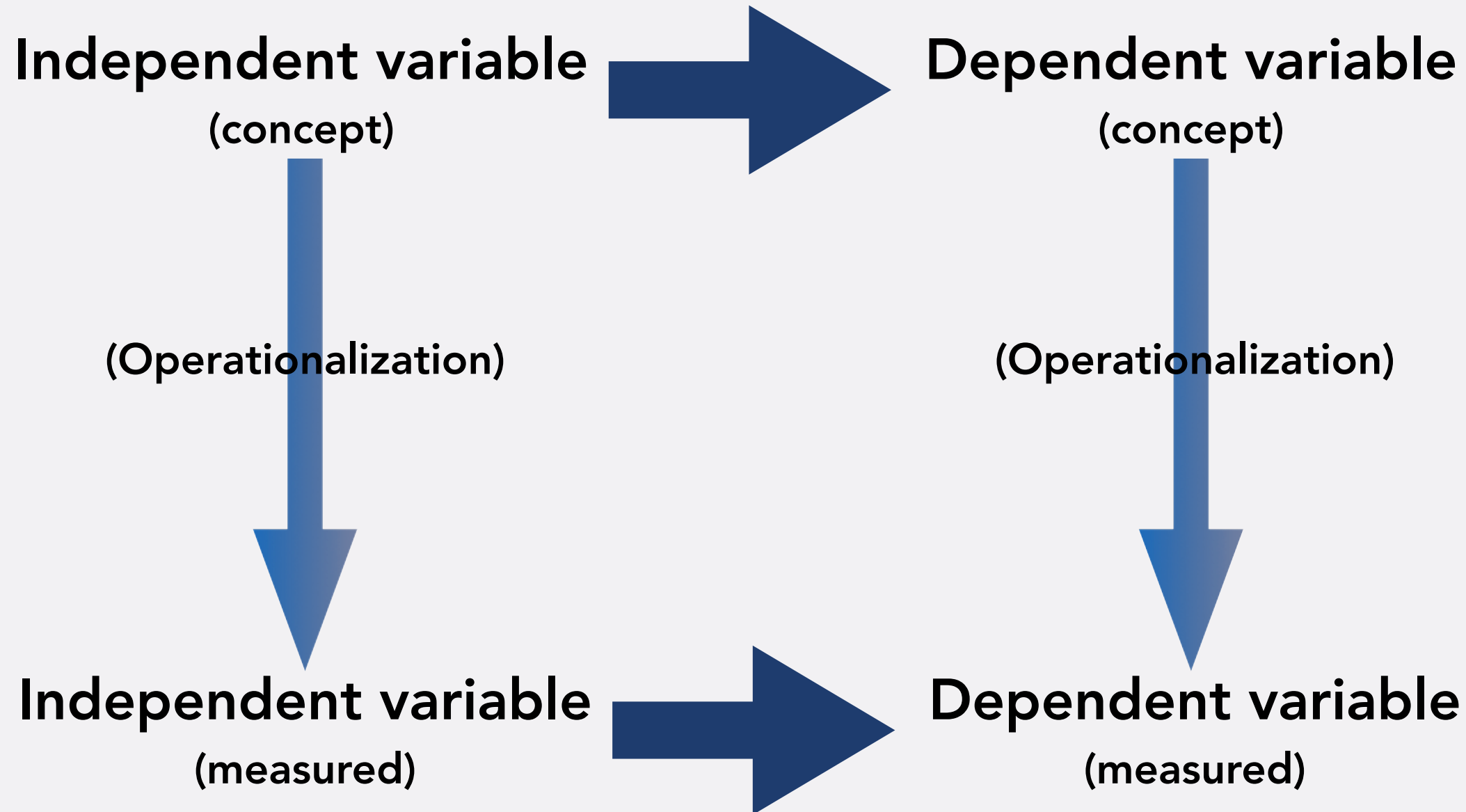
# **INTRODUCTION TO POLITICAL ANALYSIS VARIABLES**

# WHERE WE ARE

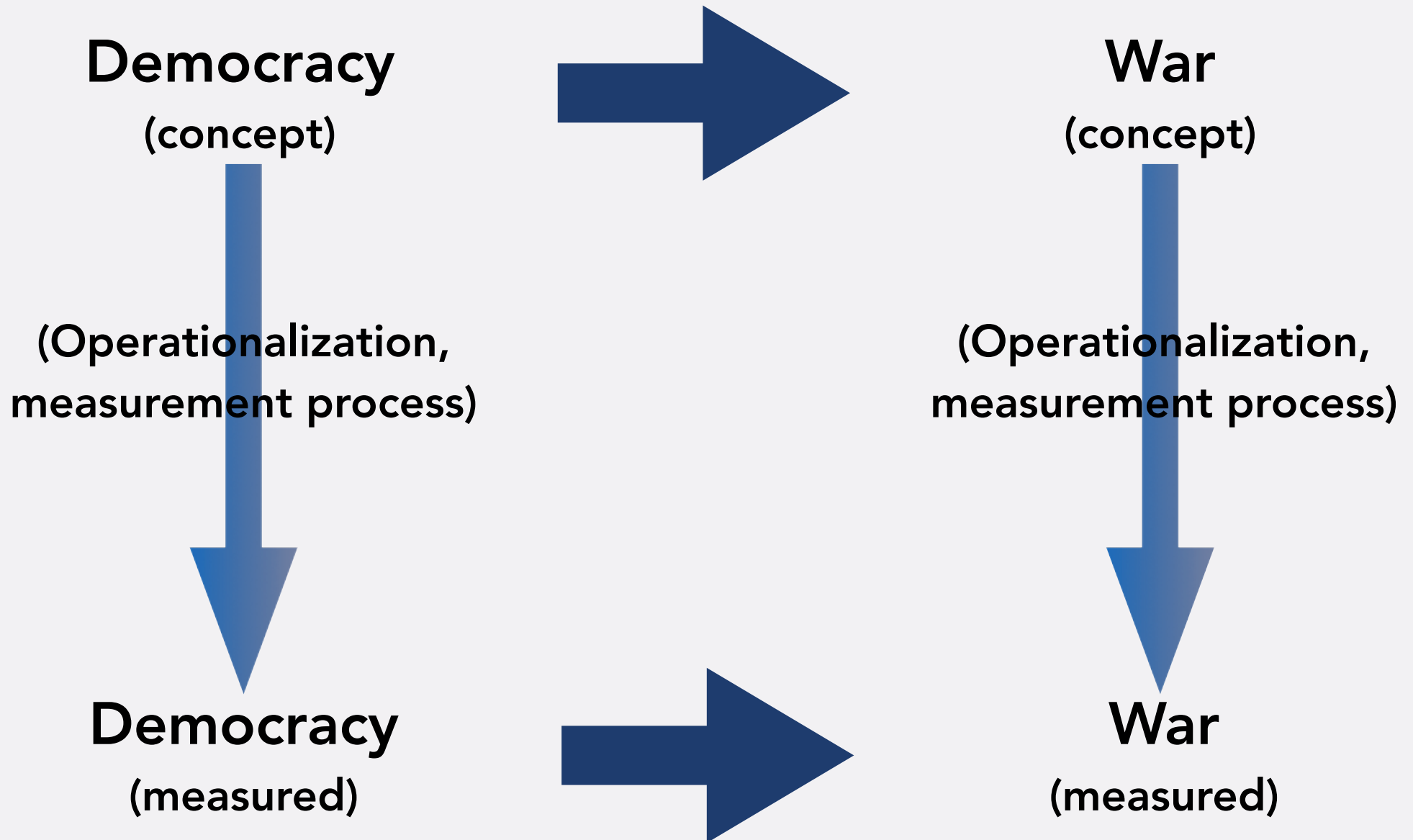
- Formulate research question
- Propose explanation/theory, hypotheses
- Data collection process
- Use data to evaluate hypotheses
- Reassess explanation



# RECAP



# MEASUREMENT PROCESS



# MEASUREMENT PROCESS

Concept



**Precise Definition of Concept  
(Conceptual Definition)**



**Measurement Strategy  
(Operational Definition)**



**Variable**

- **Example: Democracy**

# MEASUREMENT PROCESS

**Concept**



**Precise Definition of Concept**  
**(Conceptual Definition)**



**Measurement Strategy**  
**(Operational Definition)**



**Variable**

# CONCEPTUAL DEFINITION

- The concept of democracy is defined as the extent to which countries exhibit the characteristic of having open and competitive contests to decide leadership

# MEASUREMENT PROCESS

**Concept**



**Precise Definition of Concept  
(Conceptual Definition)**



**Measurement Strategy  
(Operational Definition)**



**Variable**



# OPERATIONAL DEFINITION

- **How can we measure whether countries have open and competitive contests to decide leadership?**

# OPERATIONAL DEFINITION

- A good operational definition
  - "Recipe"
  - Provides answers to:
    - What procedure is used to collect the data?
    - How will the concept be measured?
    - What "metric" will be employed?

# OPERATIONAL DEFINITION

- **How can we measure whether countries have open and competitive contests to decide leadership?**

# OPERATIONAL DEFINITION

- **Example Democracy:**
  - What procedure is used to collect the data?
    - Country experts rate countries
  - How will the concept be measured?
    - regulation of executive recruitment, competitiveness of executive recruitment, openness of executive recruitment, constraints on chief executive
  - What "metric" will be employed?
    - For each of the 4 components, experts rate country, then ratings are added up, resulting in score from -10 (strongly autocratic) to 10 (strongly democratic)

# TODAY

**Concept**



**Precise Definition of Concept  
(Conceptual Definition)**

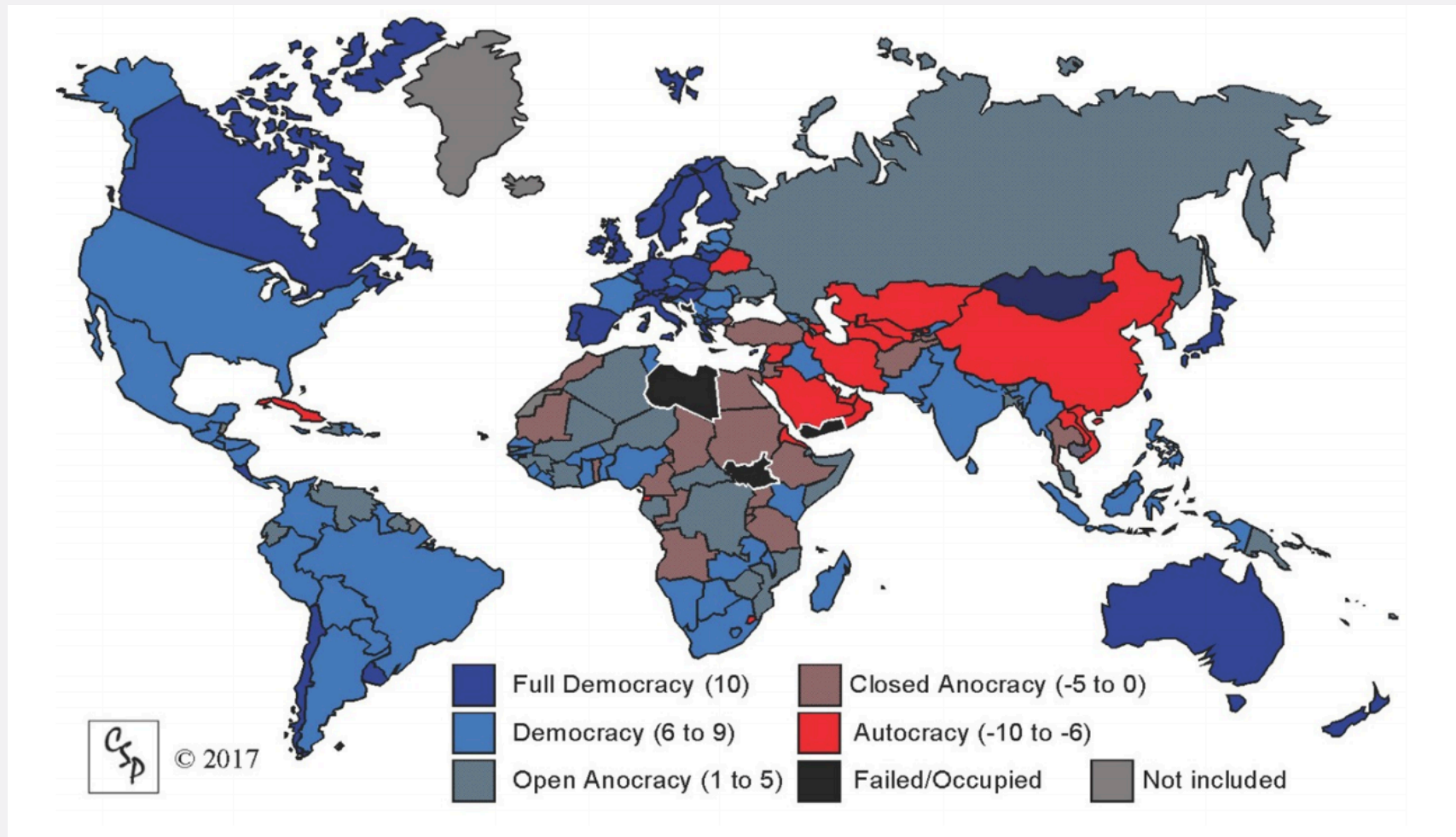


**Measurement Strategy  
(Operational Definition)**



**Variable**

# VARIABLE



- Polity IV

# ANOTHER, SIMPLER, EXAMPLE

- Concept: religiosity
- Conceptual definition: The concept of religiosity is defined as the extent to which individuals exhibit the characteristic of attending religious services

# OPERATIONAL DEFINITION

- **Example Religiosity:**
  - What procedure is used to collect the data?
    - Face-to-face survey of a random sample of adult Americans
  - How will the concept be measured?
    - "How often do you attend religious services?"
  - What "metric" will be employed?
    - Never; Less than once/year; Once/year; Several times/year; Once/month; 2-3x/month; Nearly every week; Every week; More than once/week



# TODAY

- Concepts
- Measurement Process
- Measurement Issues

# THINGS TO CONSIDER

- **What qualities should a good operationalization have?**

# RELIABILITY

- **Applying the same measurement rules to the same case should produce identical results**

# RELIABILITY

## 3.3 XROPEN (all versions)

Openness of Executive Recruitment: Recruitment of the chief executive is "open" to the extent that all the politically active population has an opportunity, in principle, to attain the position through a regularized process. If power transfers are coded Unregulated (1) in the Regulation of Executive Recruitment (variable 3.1), or involve a transition to/from Unregulated, Openness is coded 0. Four categories are used:

(1) Closed: Chief executives are determined by hereditary succession, e.g. kings, emperors, beys, emirs, etc. who assume executive powers by right of descent. **An executive selected by other means may proclaim himself a monarch but the polity he governs is not coded "closed" unless a relative actually succeeds him as ruler.**

(2) Dual Executive–Designation: Hereditary succession plus executive or court selection of an effective chief minister.

(3) Dual Executive–Election: Hereditary succession plus electoral selection of an effective chief minister.

(4) Open: Chief executives are chosen by elite designation, competitive election, or transitional arrangements between designation and election.

- Polity IV: A team of experts applies a set of coding rules
- Is this likely to produce identical results when done repeatedly?

# RELIABILITY

- Applying same measurement rules to same case should produce identical results
  - If yes: measure is *reliable*
  - If not: Sometimes too high, sometimes too low
  - Random measurement error



not reliable

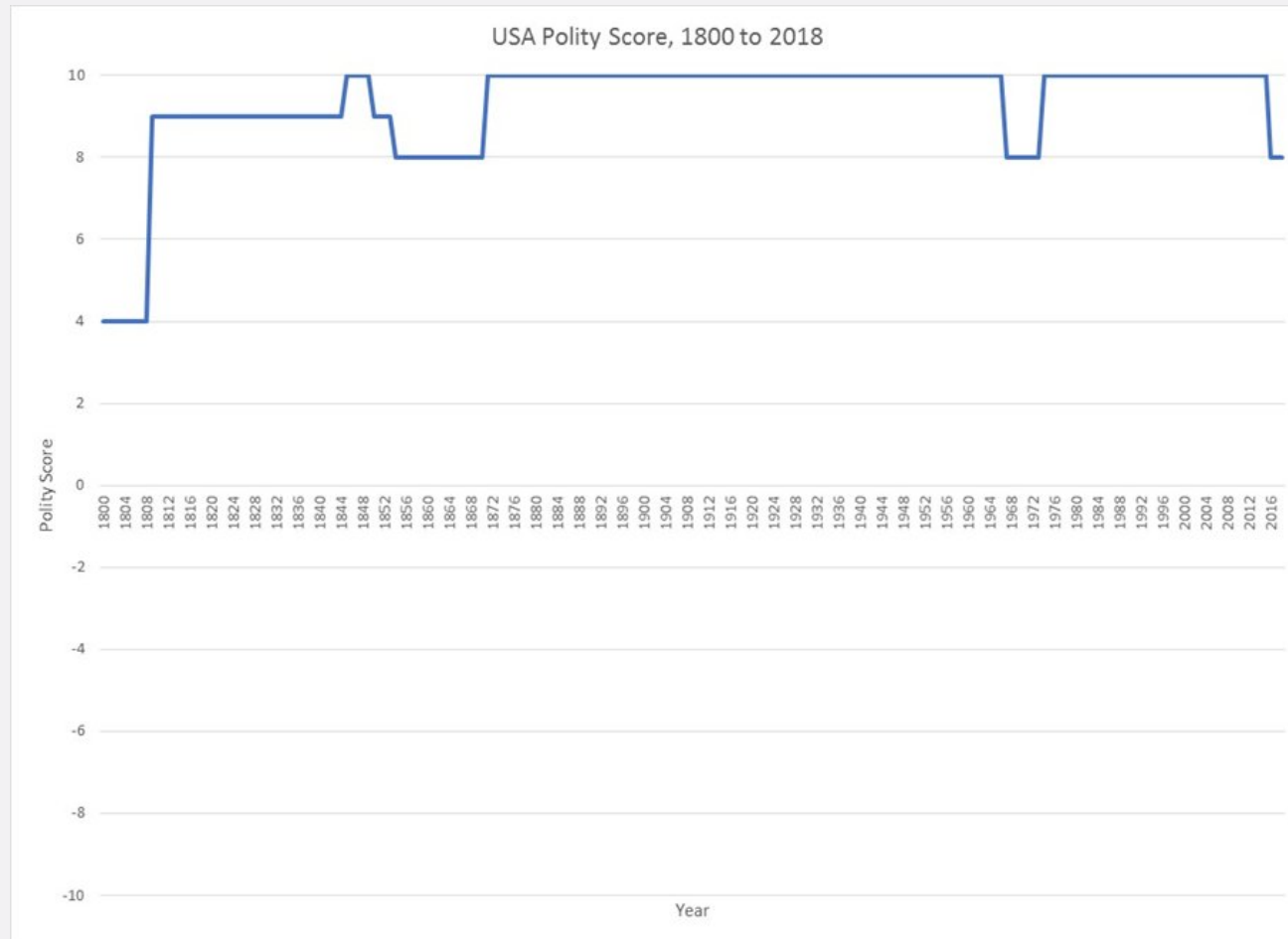
# RELIABILITY

- **Religiosity**
  - “How often do you attend religious services?”
  - Never; Less than once/year; Once/year; Several times/year; Once/month; 2-3x/month; Nearly every week; Every week; More than once/week
- Is this likely to produce identical results when done repeatedly?

# VALIDITY

- **Measure should measure what it's supposed to measure**

# VALIDITY



- Polity IV score for US
- Does this measure the concept of democracy?



# VALIDITY

- Robert Dahl: Democracy=contestation and participation
- Polity IV measure only considers contestation: whether country has open and competitive contest for leadership
- It does not consider participation: degree to which citizens can participate in that process

# VALIDITY

- Measure should measure what it's supposed to measure
  - If yes: measure is *valid*
  - If not: consistently measures something else than it sets out to measure
  - Systematic measurement error



not valid (but reliable)

# VALIDITY

- **Religiosity**
  - “How often do you attend religious services?”
  - Never; Less than once/year; Once/year; Several times/year; Once/month; 2-3x/month; Nearly every week; Every week; More than once/week
- Does this measure religiosity?

# TODAY

**Concept**



**Precise Definition of Concept  
(Conceptual Definition)**



**Measurement Strategy  
(Operational Definition)**



**Variable**

# DESCRIBING A VARIABLE

Data Editor (Browse) — mp_final.dta																	
id[1]		10001															
	selcom_adm~t	selcom_bac~t	selcom_fin~t	selcom_all~t	selc~iv_post	selcom_pro~t	selcom_sel~t	com_house~t	com_public~t	com_electo~t	com_parl_s~t	com_eccles~t	com_intell~t	gender	oxbridge	othertop	noun:
1	0	0	0	0	0	0	0	0	0	0	0	0	0	female	1	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	female	1	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	female	1	0	
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9	1	0	1	0	0	0	1	0	0	0	0	0	0	male	0	0	
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12	1	0	1	0	0	0	1	0	0	0	0	0	0	male	0	0	
13	1	0	1	0	0	0	1	0	0	0	0	0	0	male	0	0	
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20	0	0	0	0	0	0	1	0	0	1	0	0	0	male	0	0	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	male	0	0	
22	0	0	0	0	0	0	0	0	0	0	0	0	0	male	0	0	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	male	0	0	
24	0	0	0	0	0	0	0	0	0	0	0	0	0	male	0	0	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	male	0	0	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	male	0	0	
27	0	1	0	0	0	0	0	0	0	0	0	0	0	male	0	0	
28	0	0	0	0	0	0	0	0	0	0	0	0	1	male	1	0	
29	0	0	0	0	0	0	0	0	0	0	0	0	1	male	1	0	
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44	0	0	0	0	1	0	0	0	0	0	0	0	0	male	0	0	
45	0	0	0	0	1	0	0	0	0	0	0	0	0	male	0	0	
46	0	0	0	0	0	0	0	0	0	0	0	0	1	male	0	0	
47	0	0	0	0	0	0	0	0	0	0	0	0	1	male	0	0	
48	0	0	0	0	0	0	0	0	0	0	0	0	1	male	0	0	
49	0	0	0	0	0	0	0	0	0	0	0	0	1	male	0	0	

Vars: 264 Order: Dataset      Obs: 4,722

# DESCRIBING VARIABLES

## The average American household income

As I mentioned, the overall average household income was \$65,751 in 2014. However, the average can vary significantly depending on your household's composition. For example, a single-person household earning \$65,751 could have a completely different financial situation than a family of five with the same income.

With that in mind, here's the average American household income by tax filing status:

### Tax Filing Status

#### Adjusted Gross Income (AGI)

MARRIED FILING JOINTLY	\$117,795
Married filing separately	\$64,819
Head of household	\$35,876
Widow/Widower	\$57,577
Single	\$34,940

Data source: IRS Statistics of Income, 2014.

# DESCRIBING VARIABLES

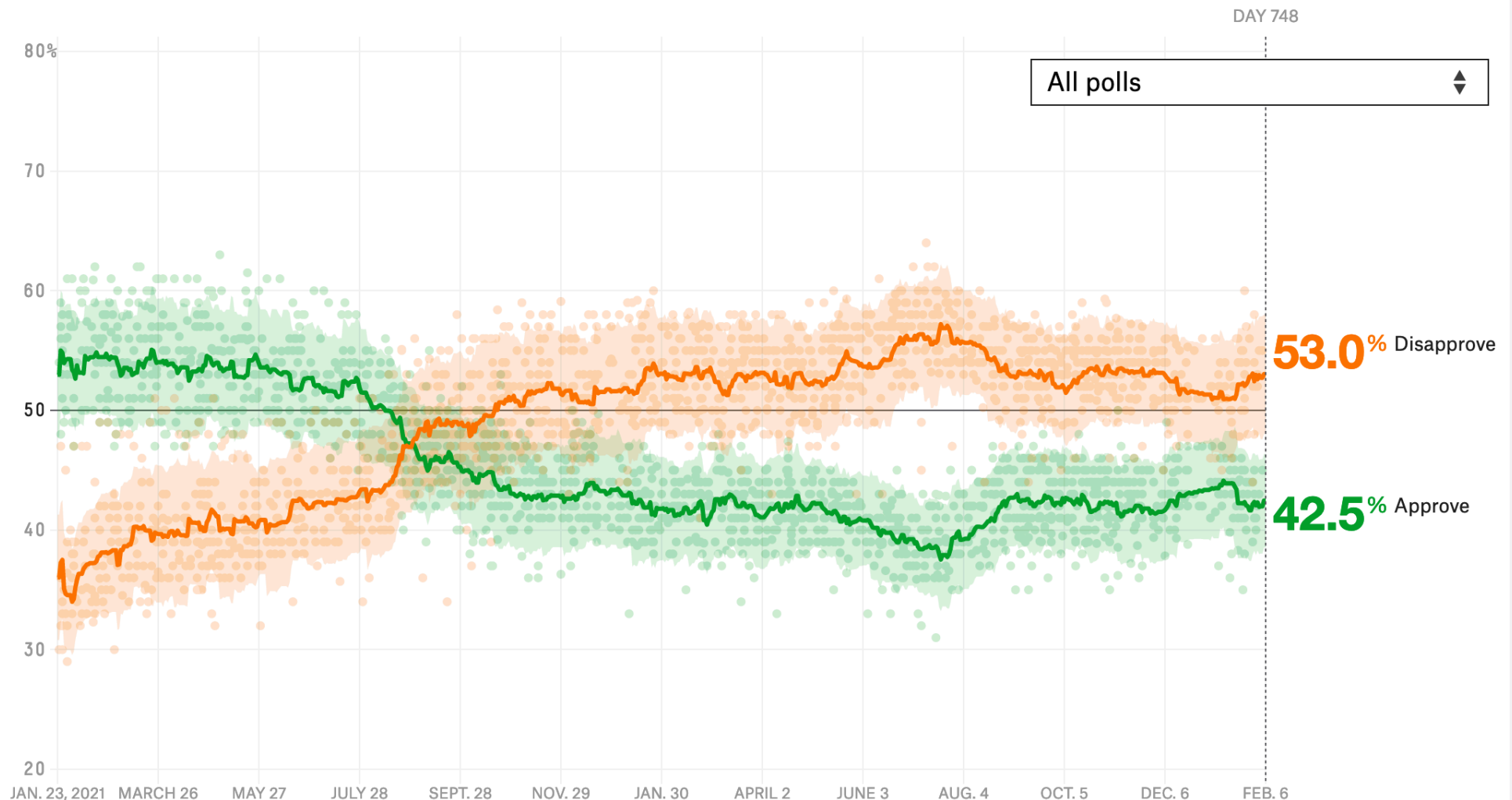
**US income inequality continues to grow**

# DESCRIBING VARIABLES

UPDATED FEB. 6, 2023, AT 8:13 AM

## How **unpopular** is Joe Biden?

An updating calculation of the president's approval rating, accounting for each poll's quality, recency, sample size and partisan lean. [How this works »](#)





# VARIABLES

- **Today and next class: Variables**
  - **Properties of variables**
  - **How to describe variables**
  - **How to graph variables**

# EXAMPLE VARIABLES

- **Gender**
  - male
  - female

# EXAMPLE VARIABLES

- **Gender**
    - male
    - female
- Variable label
- Variable values

# EXAMPLE VARIABLES

- **Ideology** **Variable label**

- Extremely liberal
- liberal
- slightly liberal
- moderate
- slightly conservative
- conservative
- extremely conservative

**Variable values**

# EXAMPLE VARIABLES

- Age **Variable label**
  - 0
  - 1
  - 2 **Variable values**
  - 3
  - ...
- Three variables have different characteristics...

# AGE

- Values: 0, 1, 2, 3, ...
- Two people: A: 30, B: 60
- Three things we can say about A and B's age:
  - 
  - 
  -

# AGE

- Values: 0, 1, 2, 3, ...
- Two people: A: 30, B: 60
- Three things we can say about A and B's age:
  - Their ages are different
  - B has a higher age than A
  - B's age is twice as much as that of A

# IDEOLOGY

- Values: extremely liberal, liberal, slightly liberal, moderate, slightly conservative, conservative, extremely conservative
- Two people: A: slightly liberal, B: extremely liberal
- What can we say about A and B's political views?
  - 
  - 
  -



# IDEOLOGY

- Values: extremely liberal, liberal, slightly liberal, moderate, slightly conservative, conservative, extremely conservative
- Two people: A: slightly liberal, B: extremely liberal
- What can we say about A and B's political views?
  - Their political views are different
  - B is more liberal than A
  - B is two/three/four/X times as liberal as A

# IDEOLOGY

- Values: extremely liberal, liberal, slightly liberal, moderate, slightly conservative, conservative, extremely conservative
- Two people: A: slightly liberal, B: extremely liberal
- What can we say about A and B's political views?
  - Their political views are different
  - B is more liberal than A
  - ~~B is two/three/four/X times as liberal as A~~

# GENDER

- Values: male, female
- Two people: A: male, B: female
- What can we say about A and B's genders?
  - 
  - 
  -

# GENDER

- Values: male, female
- Two people: A: male, B: female
- What can we say about A and B's genders?
  - Their genders are different
  - B is more    ?    than A
  - B is two/three/four/X times as    ?    as A

# GENDER

- Values: male, female
- Two people: A: male, B: female
- What can we say about A and B's genders?
  - Their genders are different
  - ~~B is more \_\_\_?\_\_\_ than A~~
  - ~~B is two/three/four/X times as \_\_\_?\_\_\_ as A~~

# LEVELS OF MEASUREMENT

- Variables provide different amounts of information
  - differences between values
  - ranking of values
  - exact differences between values
- Determines how you can summarize/graph/analyze variable

# LEVELS OF MEASUREMENT

Relative Differences  Ranking  Exact Differences Between Units			

# LEVELS OF MEASUREMENT

	Nominal		
Relative Differences	✓		
Ranking	X		
Exact Differences Between Units	X		

- e.g. gender



# LEVELS OF MEASUREMENT

	Nominal	Ordinal	
Relative Differences	✓	✓	
Ranking	X	✓	
Exact Differences Between Units	X	X	

- e.g. ideology

# LEVELS OF MEASUREMENT

	Nominal	Ordinal	Interval
Relative Differences	✓	✓	✓
Ranking	X	✓	✓
Exact Differences Between Units	X	X	✓

- e.g. age

# EXERCISE

- Variable names below
  - What are the variable values?
  - What level of measurement does the variable have?
- 
- Income
  - Marital status
  - Support for universal health insurance
  - Class grades

# INCOME

- **Values: Dollars per year**
- **Relative Differences?**
- **Ranking?**
- **Exact differences between units?**

# INCOME

- Values: Dollars per year
- Relative Differences? **YES**
- Ranking?
- Exact differences between units?

# INCOME

- Values: Dollars per year
- Relative Differences? **YES**
- Ranking? **YES**
- Exact differences between units?

# INCOME

- Values: Dollars per year
- Relative Differences? YES
- Ranking? YES
- Exact differences between units? YES

# INCOME

	Nominal	Ordinal	Interval
Relative Differences	✓	✓	✓
Ranking	X	✓	✓
Exact Differences Between Units	X	X	✓

- There is an ordering to the values, and the distance between them is known



# MARITAL STATUS

- Values: single, married, divorced
- Relative Differences?
- Ranking?
- Exact differences between units?

# MARITAL STATUS

- Values: single, married, divorced
- Relative Differences? **YES**
- Ranking?
- Exact differences between units?

# MARITAL STATUS

- Values: single, married, divorced
- Relative Differences? **YES**
- Ranking? **NO**
- Exact differences between units?

# MARITAL STATUS

- Values: single, married, divorced
- Relative Differences? YES
- Ranking? NO
- Exact differences between units? NO

# MARITAL STATUS

	Nominal	Ordinal	Interval
Relative Differences	✓	✓	✓
Ranking	X	✓	✓
Exact Differences Between Units	X	X	✓

- Values just represent a category, there is no ordering to the values

# HEALTH INSURANCE

- **“The United States should have universal health insurance”**
- **Values: strongly agree, agree, disagree, strongly disagree**
- **Relative Differences?**
- **Ranking?**
- **Exact differences between units?**

# HEALTH INSURANCE

- “The United States should have universal health insurance”
- Values: strongly agree, agree, disagree, strongly disagree
- Relative Differences? **YES**
- Ranking?
- Exact differences between units?

# HEALTH INSURANCE

- “The United States should have universal health insurance”
- Values: strongly agree, agree, disagree, strongly disagree
- Relative Differences? **YES**
- Ranking? **YES**
- Exact differences between units?



# HEALTH INSURANCE

- “The United States should have universal health insurance”
- Values: strongly agree, agree, disagree, strongly disagree
- Relative Differences? **YES**
- Ranking? **YES**
- Exact differences between units? **NO**

# HEALTH INSURANCE

	Nominal	Ordinal	Interval
Relative Differences	✓	✓	✓
Ranking	X	✓	✓
Exact Differences Between Units	X	X	✓

- There is an ordering to the values, but the distance between each of the values is unknown

# SOME EXERCISES

- **“How often do you attend religious services?”**
  - **Never; Less than once/year; Once/year; Several times/year; Once/month; 2-3x/month; Nearly every week; Every week; More than once/week**
- **Nominal, ordinal, or interval?**

# SOME EXERCISES

- **“How often have you attended religious services in the past year?”**
- **Nominal, ordinal, or interval?**

# SOME EXERCISES

- **“In what religion were you raised?”**
  - Protestant, Catholic, Jewish, Muslim, etc.
- **Nominal, ordinal, or interval?**

# CLASS GRADES?

- **A, A-, B+, B, B-, C+, C, C-, D, F**
- **What is it?**