Measurement

Professor Velez (10/16/22)

Class Recap

- Defined the concept of causality

  - Difference in potential outcomes

- Settled on a useful way of approaching causality

  - Experiments

    - Randomization guarantees that we can recover "average treatment effects."

- Conducted experiments

- Class-wide survey experiment

  - Testing the effectiveness of your intervention

This week

- Causality is $Y_i(1) - Y_i(0)$

- Average treatment effects can be recovered by subtracting two quantities

  - $Avg[Y_i(1)] - Avg[Y_i(0)]$

- Thus far, our class has focused on design and analysis

- But, how do we even obtain these "potential outcomes" in the first place?

- Physical sciences

  - Measures can have a close connection to the constructs of interest

- Social sciences

  - We are often interested in measuring "latent" or unobserved variables

Plan for the week

- Discuss different qualities of measures

- Detail how scholars use these measures in research

  - Single items and measurement scales

- Walk through examples of popular measures

- Close with discussion of measurement theories

Qualitative vs. Quantitive data

- Empirical social science research aims to understand how social processes work using data

- Qualitative and quantitative data

  - Qualitative data refer to data that cannot be easily measured

    - Diary accounts, archives, case studies, photographs

    - (Often) use narrative or process-based methodologies

  - Quantitative data are numerical

    - Numbers, counts, and frequencies

    - (Often) use statistical models

Levels of measurement

- Nominal
  - Categorical data
    - Nominal with order
      - Temperature categories
      - "Hot, warm, cold"
    - Nominal without order
      - Regions
      - "Northeast, Southeast, etc."
    - Dichotomous
      - Turnout
      - "Yes, No"

Levels of measurement

- Ordinal
  - Ordered information, but no information about gap between categories
  - Likert items ("Strongly agree," "agree," etc.)
- Interval
  - Ordered information, but information about gap between rankings
  - Multiplication and division are not meaningful (e.g., "10 degrees Celsius is not half as cold as 20 degrees Celsius")
  - Temperature
  - Feeling thermometers
- Ratio
  - Natural zero point
  - Values can be meaningfully added, subtracted, divided, and multiplied
  - Height, mass, length
  - "Twice as tall"

Measurement in the social sciences

- Scholars are often interested in "latent variables"

- Variables that can only be inferred indirectly

- Let us suppose our outcome of interest is "political engagement"

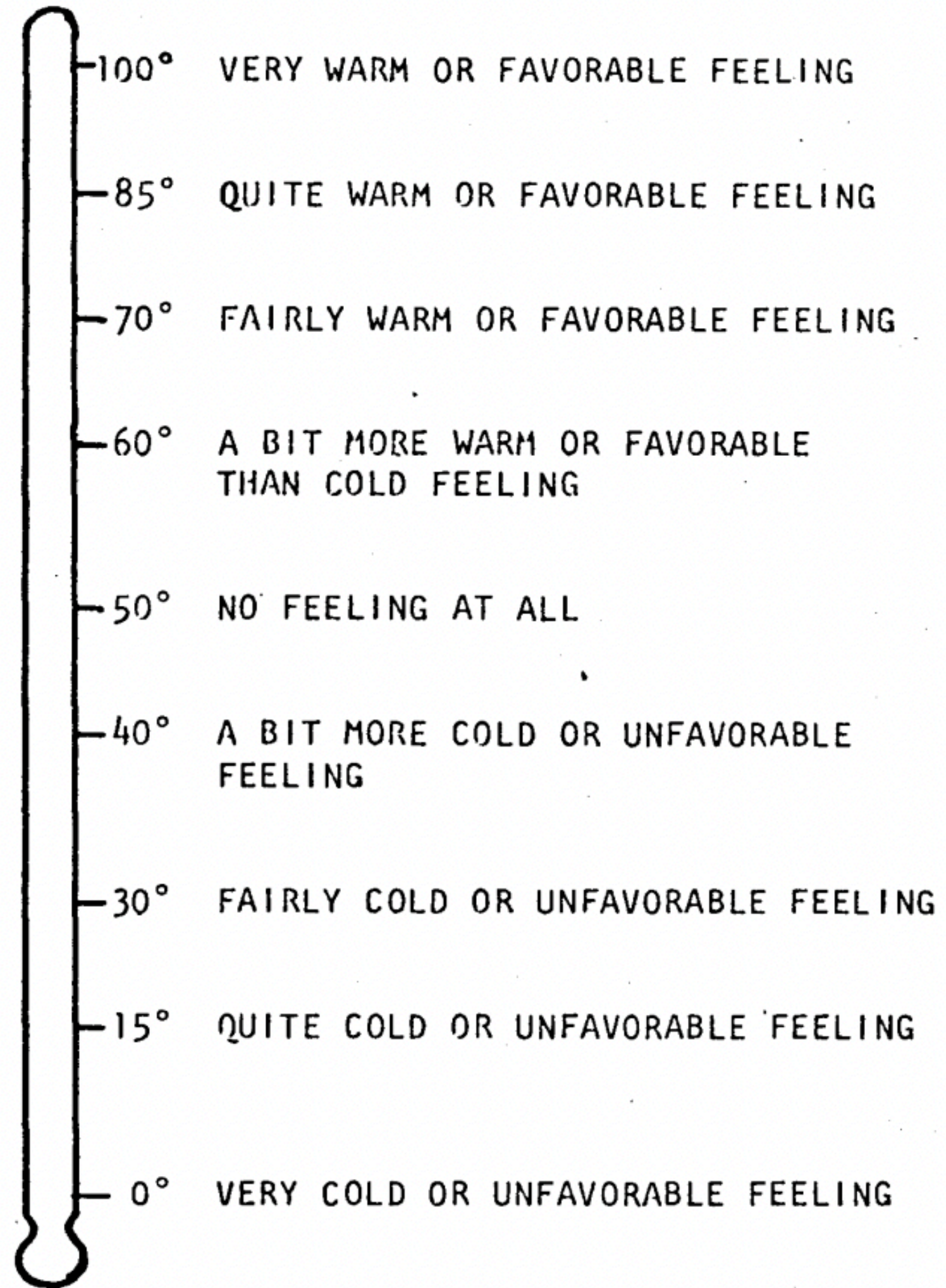- Define "political engagement"

- Define "anger"

Measurement

- Social scientists often use multi-item scales to measure latent political variables

- Scales are multiple measures of the same phenomenon that are combined to estimate the "latent variable"

- Political engagement

  - Donating, voting, protesting, canvassing, belonging to political organization

  - Assign a number to these different items

  - Example: a person who performs all of these activities gets a 5

  - Use this to array participants on a political engagement scale
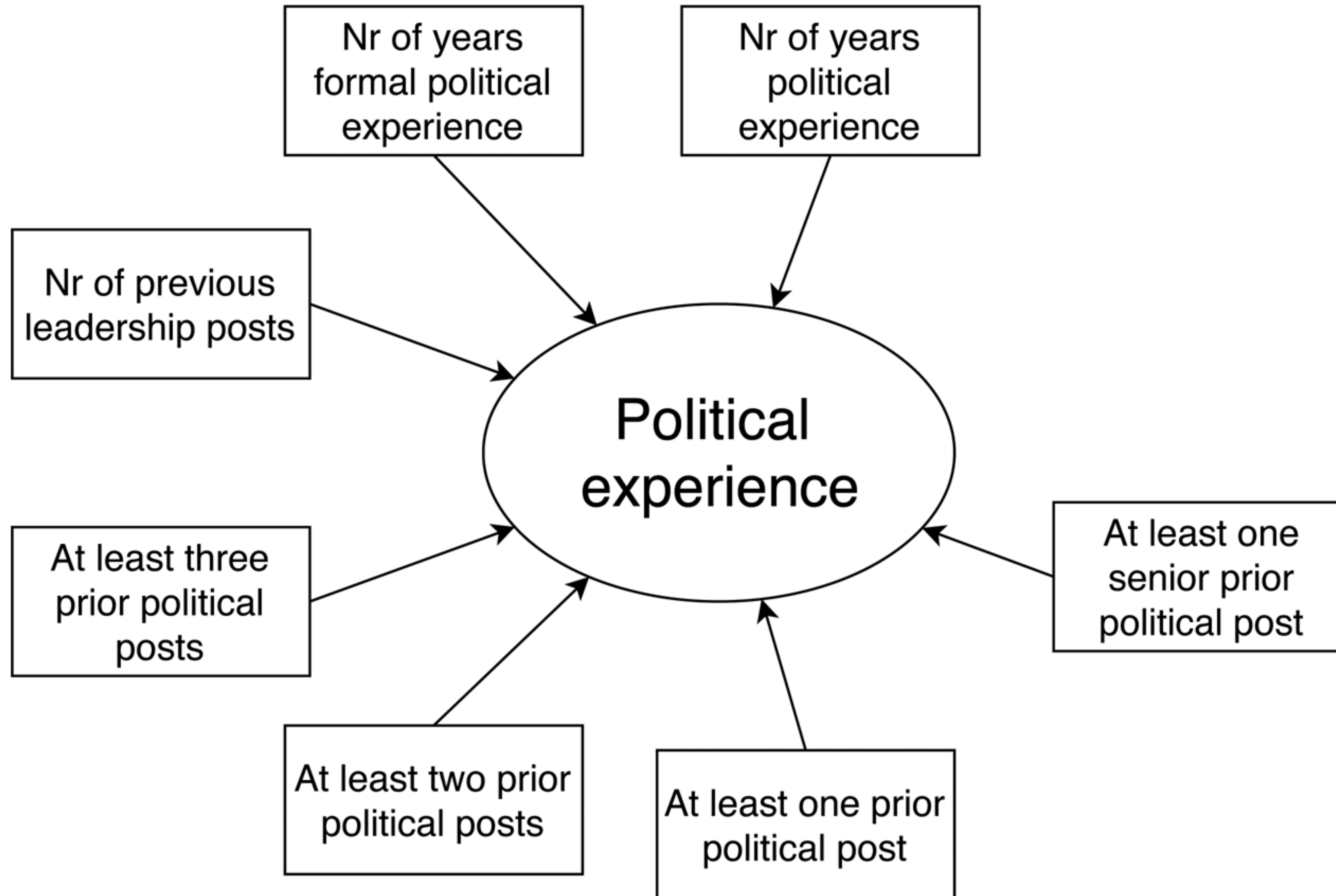
Political science concepts and their measures

- How would you define partisan animosity?

- The literature defines it as the gap in sentiment between feelings of one's own party and the other party

- "Affective polarization"

- How is this gap measured?

- Feeling thermometer

"FEELING" THERMOMETER

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─100°   VERY WARM OR FAVORABLE FEELING

─85°    QUITE WARM OR FAVORABLE FEELING

─70°    FAIRLY WARM OR FAVORABLE FEELING

─60°    A BIT MORE WARM OR FAVORABLE
        THAN COLD FEELING

─50°    NO FEELING AT ALL

─40°    A BIT MORE COLD OR UNFAVORABLE
        FEELING

─30°    FAIRLY COLD OR UNFAVORABLE FEELING

─15°    QUITE COLD OR UNFAVORABLE FEELING

─ 0°    VERY COLD OR UNFAVORABLE FEELING
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Political science concepts and their measures

- Partisan identity

  - American National Election Study (ANES)

  - 7-point scale

Question Text:

"Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or what?"
(IF REPUBLICAN OR DEMOCRAT) "Would you call yourself a strong (REPUBLICAN/DEMOCRAT) or a not very strong (REPUBLICAN/DEMOCRAT)?"
(IF INDEPENDENT, OTHER [1966 and later: OR NO PREFERENCE]:) "Do you think of yourself as closer to the Republican or Democratic party?"

Political science concepts and their measures

- Multi-item scale

- Likert items

TABLE 2. Partisan Identity by Study

	Blog Study, excludes leaners	NY State Poll, includes leaners	YouGov Study, includes leaners	Student Study, excludes leaners
"How important is being a [Democrat/ Republican] to you?"				
Extremely important (%)	29.1	11.6	23.4	6.9
Very important (%)	39.8	37.7	35.3	47.5
Not very important (%)	26.9	36.6	32.7	43.8
Not important at all (%)	4.1	14.1	8.6	1.8
"How well does the term [Democrat/ Republican] describe you?"				
Extremely well (%)	23.0	11.3	18.6	6.5
Very well (%)	55.0	47.6	38.9	56.0
Not very well (%)	21.2	31.9	32.6	36.1
Not at all (%)	0.9	9.3	9.9	1.4
"When talking about [Democrats/ Republicans], how often do you use "we instead of "they"?"				
All of the time (%)	17.1	9.5	15.1	6.5
Most of the time (%)	36.6	13.8	22.3	21.7
Some of the time (%)	27.6	26.7	24.5	33.6
Rarely (%)	14.5	22.4	18.7	23.5
Never (%)	4.2	27.5	19.5	14.8
"To what extent do you think of yourself as being a [Democrat/ Republican]?"				
A great deal (%)	49.9	26.6	33.4	22.1
Somewhat (%)	39.8	44.8	35.1	53.9
Very little (%)	9.6	20.6	20.0	22.1
Not at all (%)	0.7	8.1	11.6	1.8

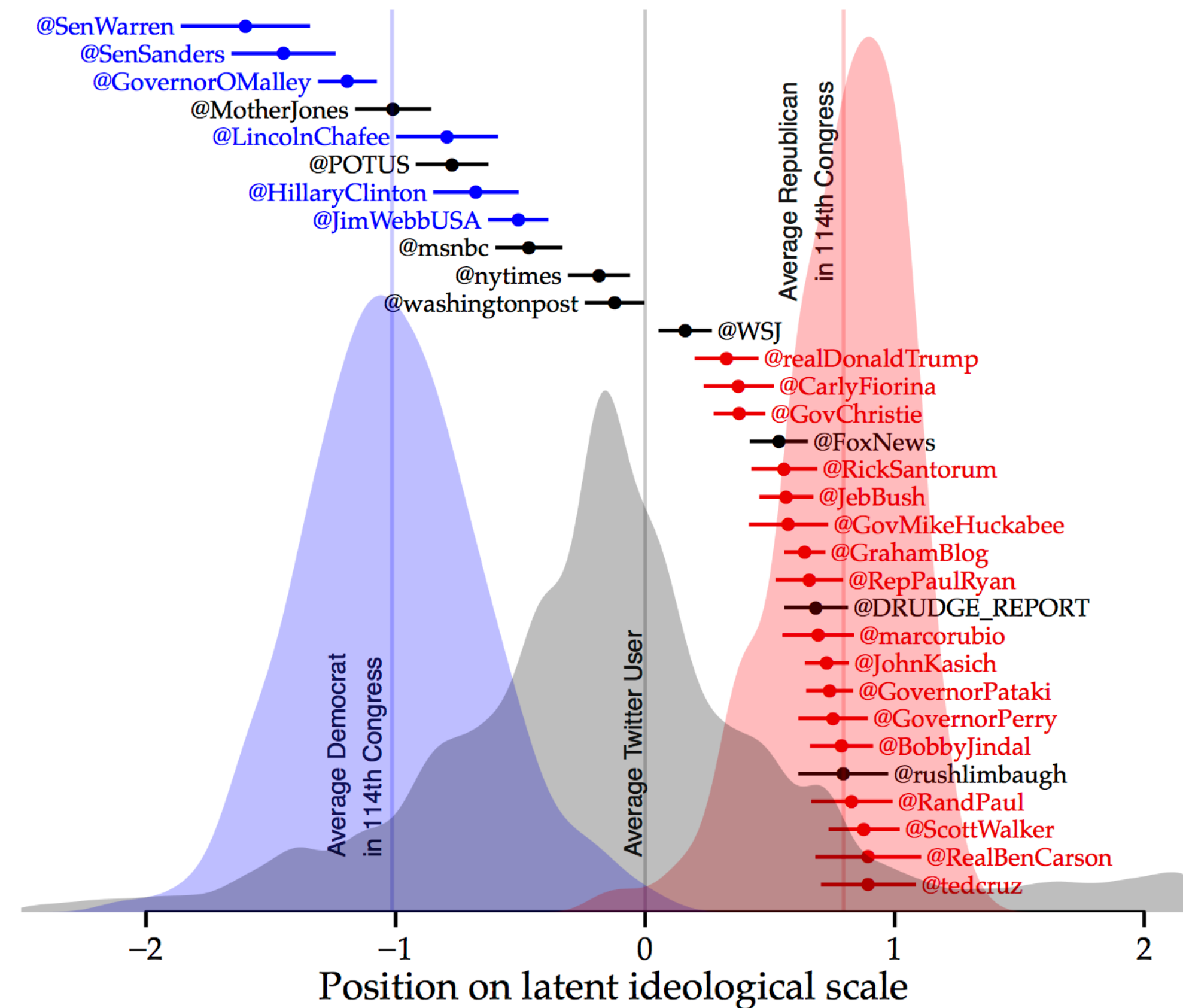# Political science concepts and their measures

The Polity Data

Many different collections of indicators of democracy have been employed at one time or another in studies of international relations and comparative politics (see the enumeration in Munck and Verkuilen 2002). We base our empirical analysis on the extensively used measures from the Polity Project (Marshall and Jaggers 2002b). Polity IV covers the period of 1800–2000 for some 184 countries, for a total of 13,941 country-years;[4] more important, all of the indicators used to construct the aggregate measure are accessible and well documented, unlike some alternative measures. The summary measure used widely in empirical applications is a country-year's "Polity score," ranging from –10 to 10, created from five expert-coded categorical indicators: (1) Competitiveness of Executive Recruitment (*Xrcomp*), (2) Openness of Executive Recruitment (*Xropen*), (3) Executive Constraints/Decision Rules (*Xconst*), (4) Regulation of Participation (*Parreg*), (5) Competitiveness of Participation (*Parcomp*). Table 1, adapted from Marshall et al. (2002), illustrates the contribution of each value of the indicators to the Polity score.
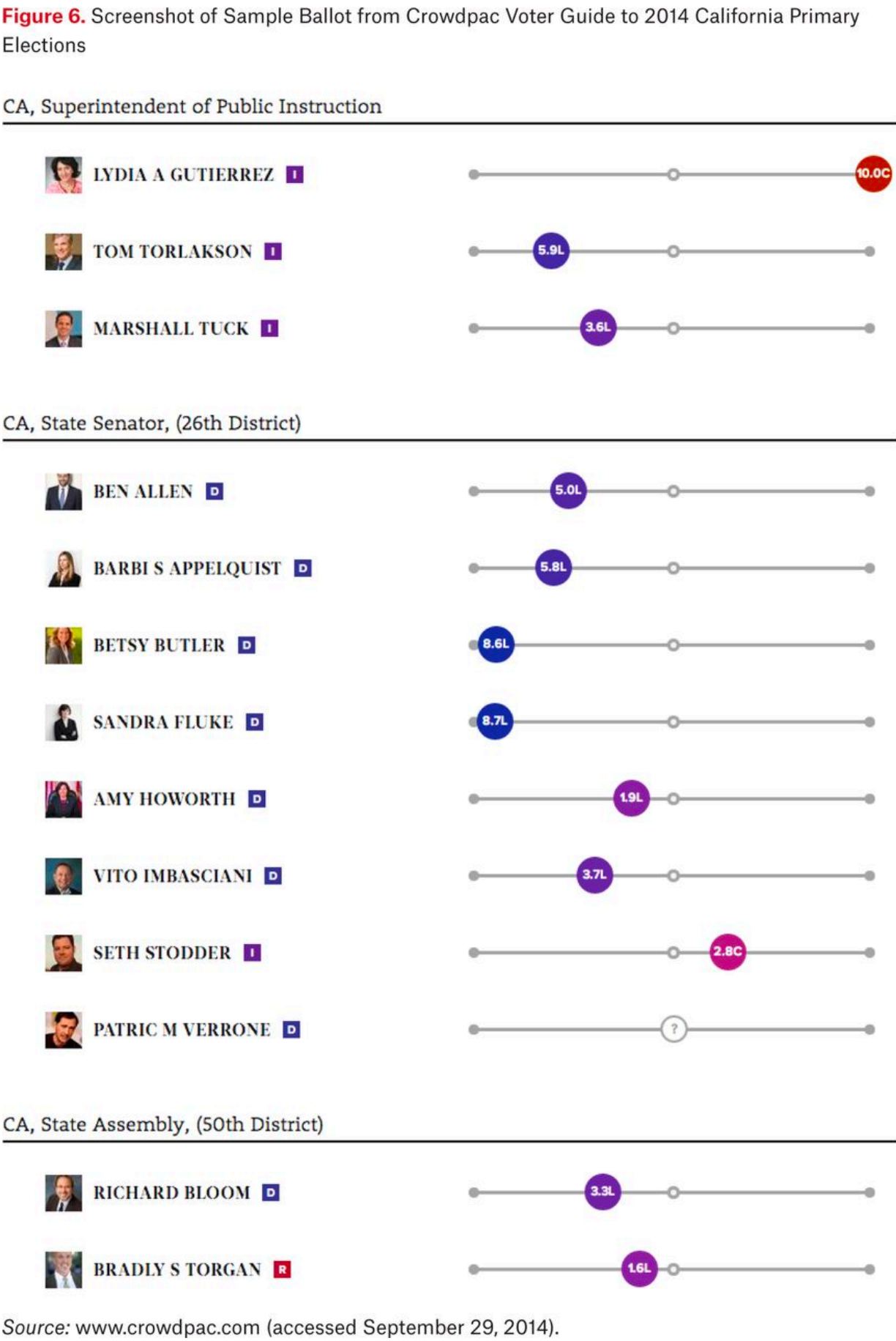
Political science concepts and their measures

Party Polarization 1879-2014
Distance Between the Parties First Dimension
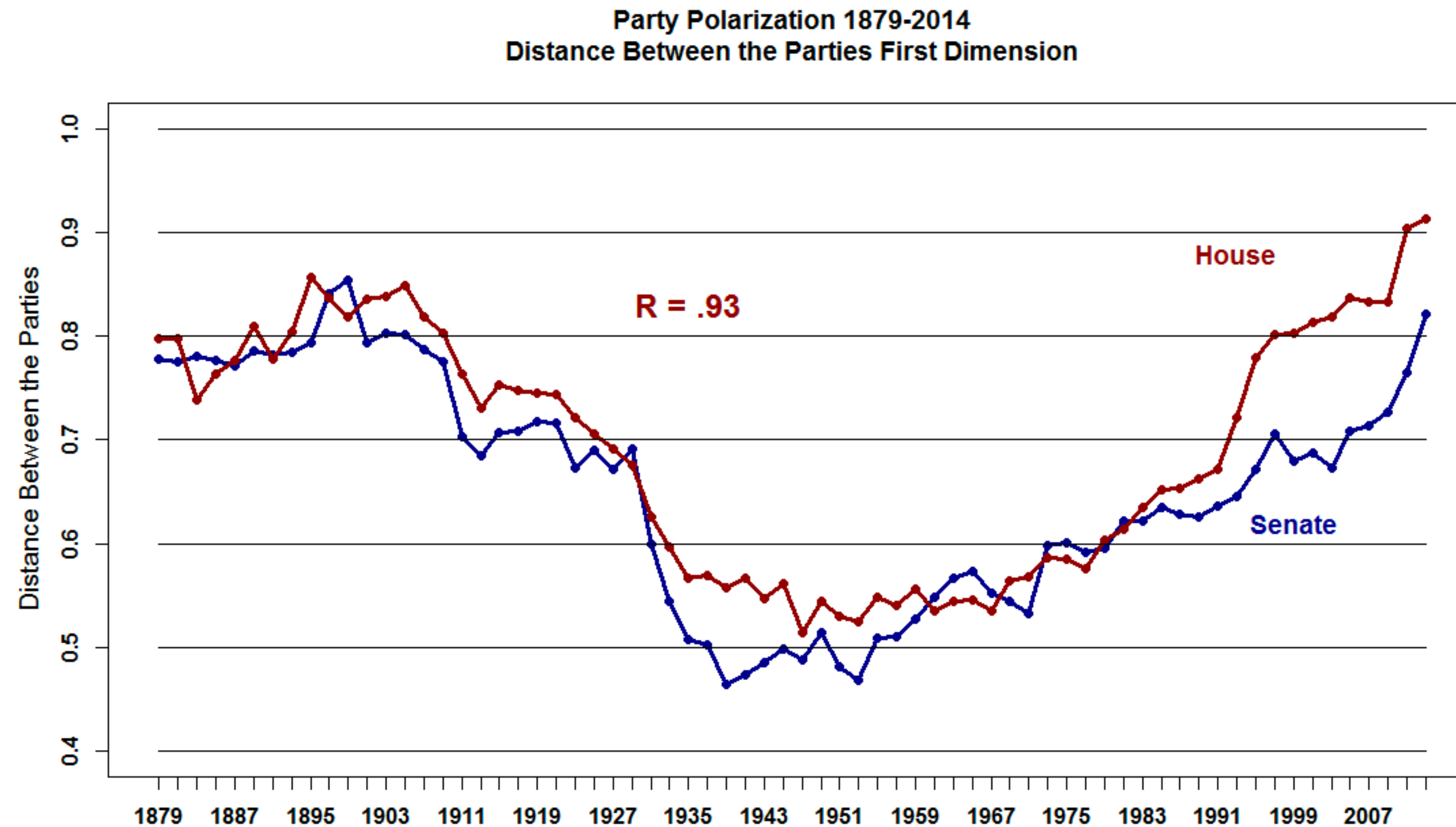
Political science concepts and their measures

Twitter ideology scores of potential Democratic and Republican presidential primary candidates

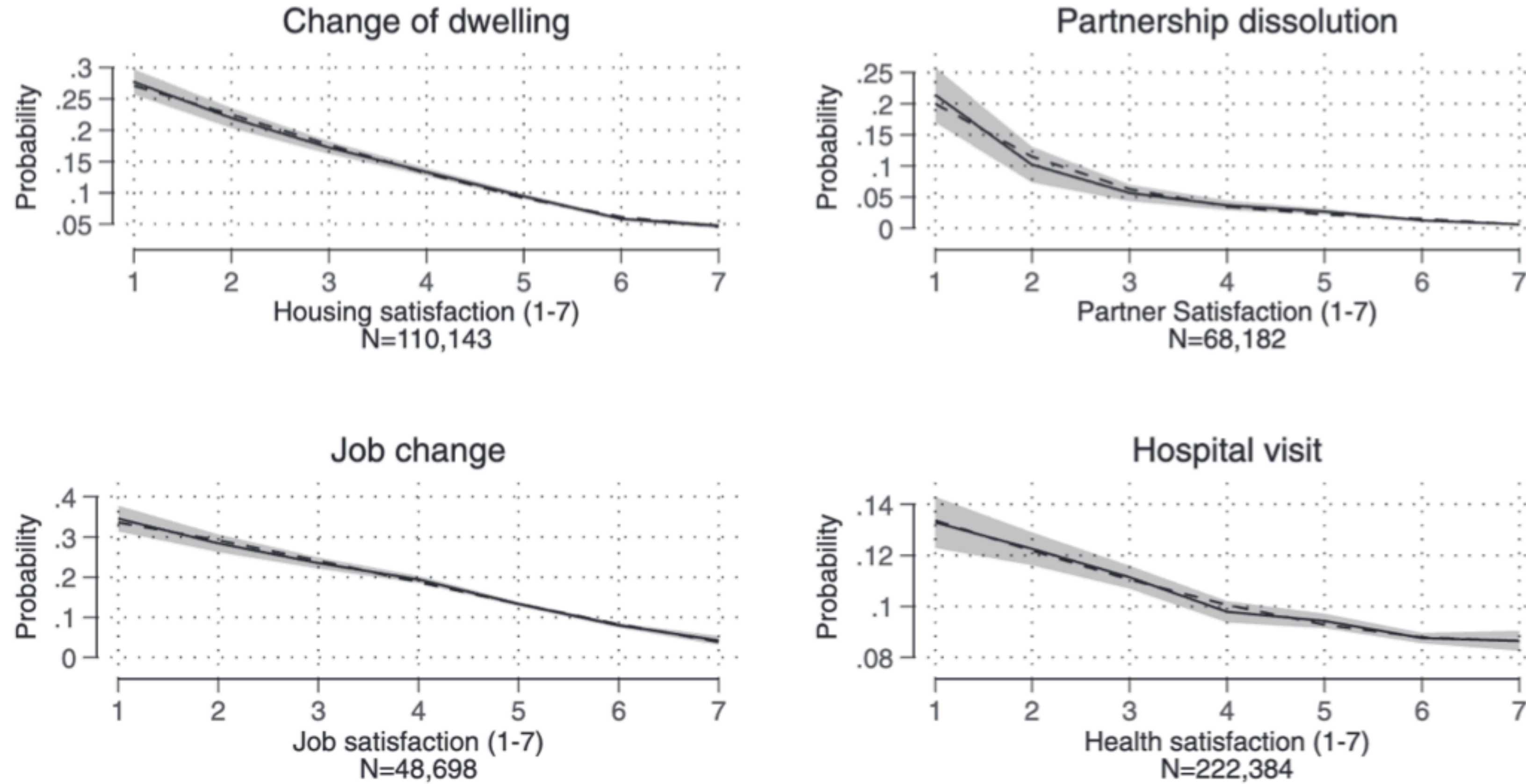Position on latent ideological scale

Source: author's elaboration from Twitter data. Figure for The Monkey Cage/Washington Post by Pablo Barberá, NYU Data Science

Political science concepts and their measures

Figure 6. Screenshot of Sample Ballot from Crowdpac Voter Guide to 2014 California Primary Elections

CA, Superintendent of Public Instruction

LYDIA A GUTIERREZ I — 10.0C

TOM TORLAKSON I — 5.9L

MARSHALL TUCK I — 3.6L

CA, State Senator, (26th District)

BEN ALLEN D — 5.0L

BARBI S APPELQUIST D — 5.8L

BETSY BUTLER D — 8.6L

SANDRA FLUKE D — 8.7L

AMY HOWORTH D — 1.9L

VITO IMBASCIANI D — 3.7L

SETH STODDER I — 2.8C

PATRIC M VERRONE D — ?

CA, State Assembly, (50th District)

RICHARD BLOOM D — 3.3L

BRADLY S TORGAN R — 1.6L

Source: www.crowdpac.com (accessed September 29, 2014).

Panel B: Fixed effects estimates, with controls