

# Political Ideology and Polarization of Policy Positions: A Multi-dimensional Approach

Barea Sinno<sup>1</sup>, Bernardo Oviedo<sup>2</sup>, Katherine Atwell<sup>3</sup>, Malihe Alikhani<sup>3</sup>, Junyi Jessy Li<sup>4</sup>

<sup>1</sup>Political Science, Rutgers University; <sup>2</sup>Computer Science, <sup>4</sup>Linguistics, The University of Texas at Austin; <sup>3</sup>Computer Science, University of Pittsburgh

## Motivation

- Stance in media is different from ideology in text
- We study **ideology** as slant in policy positions and offer measures of:
  - Bias in policy position**
  - Polarization over time**

## Annotation Framework

- We conceptualize ideology using **multiple** dimensions
- Polarization is measured as an increase in pairwise **correlation** between these dimensions
- Ideology is three-dimensional: **economic, social, & foreign**
- Dimensions are annotated as either **conservative, liberal, or neutral**

## Data Collection

- Collected data from 5 different news sources across the political spectrum
- Subset political corpus into a **federal budget corpus**
- Annotated 721 total paragraphs in articles spanning from 1947 to 1974

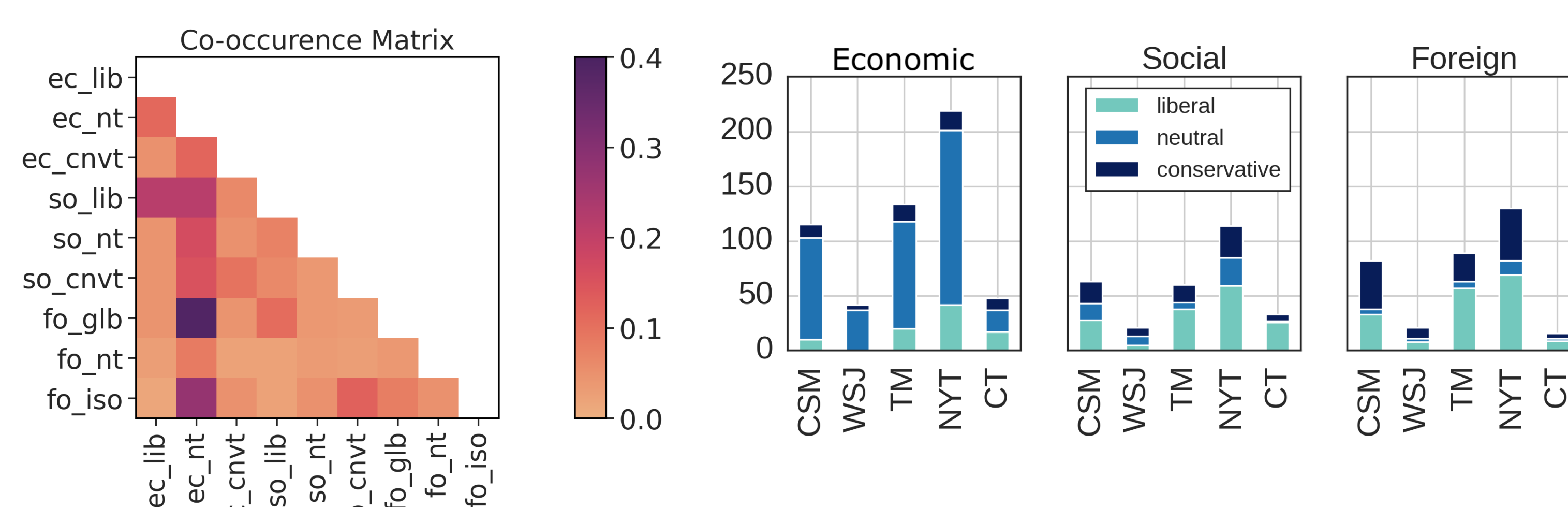
### Socially and economically conservative

The antipoverty program, the Republicans insisted, would undercut the authority of the Cabinet members by making Sargent Shriver a "poverty czar." "I don't see how you can lie down and be a doormat for this kind of operation," Representative Peter Frelinghuysen Jr., Republican of New Jersey, commented.

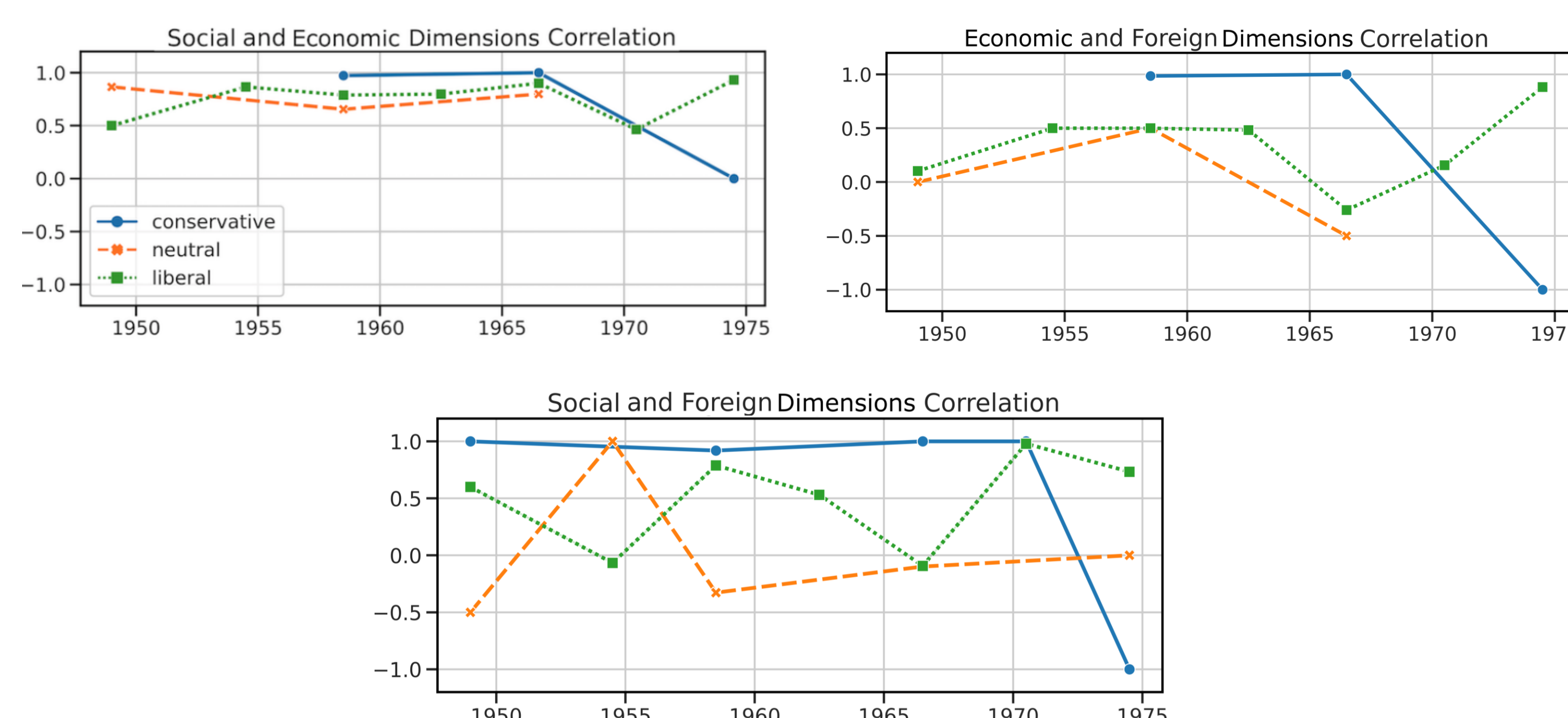
### Socially and Economically Liberal

Secretary of Defense Robert S. threw his full support today behind the Administration's drive against poverty. Citing figures showing that, about a third of the nation's youths fail either mental or physical examinations given by, the Selective Service, Mr. Mc-Namara said: "It is the youth that we can expect to be the most immediate beneficiaries of the war on poverty."

Using a novel conceptualization of ideology, we offer a more nuanced approach for studying bias in policy position



Our conceptualization also allows for studying polarization using multiple different metrics



The highest average F-1 score is **.55**, indicating that this is a **very challenging task**

	Econ	Social	Foreign	Average
Majority	0.30	0.23	0.25	0.26
BiLSTM	0.44	0.37	0.33	0.38
BERT no-ft	0.46	0.31	0.53	0.44
+pre-training	0.42	0.32	0.46	0.40
BERT ft	0.64	0.50	0.52	0.55
+pre-training	0.56	0.47	0.46	0.49
-focal loss	0.61	0.50	0.50	0.54

## Data Analysis

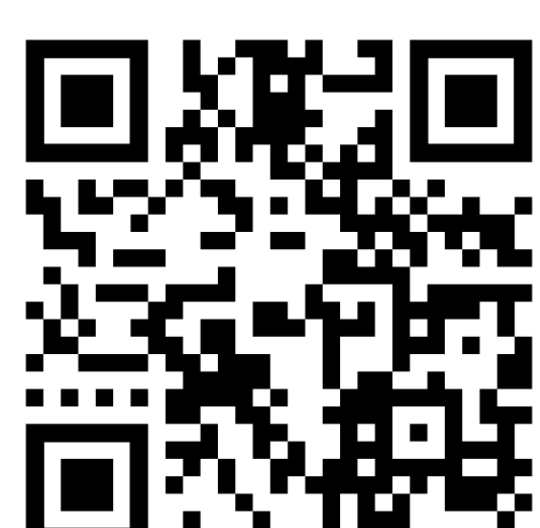
- The co-occurrence matrix shows that in our annotated sample, some policy positions co-occur more across dimensions than others.
- The bar chart aggregates distribution of ideology for each source. We see that these distributions differ from the conventional AllSides media bias ratings.
- These results attest the importance of studying across multiple dimensions.
- We can use our labels to study polarization with metrics such as the **issue constraint** (middle), which measures how closely associated ideologies are across dimensions
- Right leaning outlets** show positive correlations between dimensions before 1967/1970

## Model

- Majority Class Baseline:** simply predicting the majority class for each dimension
- Recurrent Neural Network:** 2-layer bidirectional LSTM, with sequence length and hidden size of 256, and 100D GloVe embeddings
- Pre-trained language models:** BERT-base model with and without fine-tuning
- Task-guided pre-training:** we labeled the ideology of each article following the ideology of its source in [www.allsides.com](http://www.allsides.com)

## Conclusion

- We demonstrate that ideology like stance is important in text
- Our annotations show the potential of a fine-grained approach for the study of ideology and polarization
- But predicting ideology is a difficult task!



The QR code to the left contains a link to our ArXiv preprint, which has further details about the paper and the references for this poster



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