

# Using Network Motifs to Detect Populist Narratives at the Sub- sentence Level

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We need finer granularity to capture when and how populist narratives appear

# The Aggregation Problem in Computational Measurement of Populist Speech

I will immediately restore and expand the Trump travel ban on an entry from terror plague countries, and I will implement strong ideological screening for all immigrants. If you hate America, if you want to abolish Israel, if you sympathize with Jihadists, then we don't want you in our country. We don't want you. Crooked Joe Biden puts China first, puts Asia first, puts Ukraine first, puts illegal aliens first, environmental maniacs first. Everyone else first. He puts everybody first. That's bad. But he puts America last. He puts Nevada last. He puts our workers last. He frankly puts unions last. Look what he did with the car. They're going to make all electric cars in our country, but not when I'm in there. I'll end that the first day. He puts our families last.

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In the new McLaughlin Poll of Nevada we're at 75% while DeSanctimonious is at 60 points behind us. He's at 15, so think of that, we're at 75, just came out. We're at 75. The DeSanctimonious is at 15, so we're leading by 60 points. But here's the thing you got to do, [inaudible 00:30:11], just go vote. Don't think about it. Pretend we're tied, pretend we're losing by three. You got to do this because the worst thing is everyone thinks, "Oh, what do we have to vote for? Trump is killing them, and then bad things happen when that..." Pretend we're losing. Assume that we're down by three, four, or five, okay? You don't want to do what the Washington Post does and others where they make it so that it doesn't make sense. In Wisconsin for two elections, they put me down in Wisconsin at 17, I'm 17 down, right? I said, "No way I'm 17 down. No way."

I asked John McLaughlin the great pollster, I said, "Why would they do that? I'm winning in Wisconsin." He said, "They do that because that way people don't vote." I said, "What do you mean? Well, why don't they do it like at 5:00? Because they do get killed when they lose." He said, "They don't care about that. At 17 people won't vote. They'll say, we love Trump, but we're not going to vote for him. At 5:00 they say, he has a chance. We'll vote." I said, "Wow, that's really sick, huh?" That's what it is. That's how bad they are that we won Wisconsin. They had us down 17 and we won Wisconsin, and then we did, frankly better the second time where we did better in most places the second time. People say, "How'd you do the second time?" I say, "We did much better."

If you take a look, we got millions more votes a second time, and the new Rasmussen Poll of general election we're dominating Biden by 10 points. That's a lot because a friend of mine said, "How come you're only winning by 10 or 14 points? There's another one 14 points." I said, "How could he be possibly that close?" But they have a lot of people voting for them that aren't going to vote for us. But I'll tell you, a lot of the people that would normally vote for them, like the union people are voting for us other than the top people in the unions and even some of the top people in the unions are going for us, this could be an incredible situation. African Americans, we have the highest poll numbers we've ever had. Hispanic Americans, we have the highest poll numbers the Republican Party has ever had.

We could actually win with Hispanics. I mean, it was unthinkable two or three years ago, we won the state of Florida. We did so well in Texas. We won the state of Texas and all of the border towns voted for Trump, and they're about 85, 90% Hispanic and won every single town along the border. First time in... They say the first time since reconstruction. You know what reconstruction means? That means the Civil War. I said, "Give me a definition of reconstruction to the governor of Texas who endorsed me recently, by the way, as did almost everybody else."

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## CODE WHOLE SPEECH/PARTY/PERSON AS POPULIST

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*Donald Trump, Reno, 12/2023*

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- **Loss of interpretability**

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Develop a **scalable, interpretable method** that identifies **populist narrative structures** at the most meaningful level of analysis – the actual sentences

# Our Approach: Fine-grained Interpretable Measure of Populism

# Measuring Thin-centered Populism in Text

Populist narratives have defining traits:

**Narrative Component**

**Populist-PULSAR Label**

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## Narrative Component

*Actors and Targets*

*Judgment*

*Perspective*

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# Measuring Thin-centered Populism in Text

Populist narratives have defining traits:

## Narrative Component

### *Actors and Targets*

People (acting / acted upon)

Elites (acting / acted upon)

### *Judgment*

Morally good / bad

### *Perspective*

Speaker / Non-speaker perspective

## Populist-PULSAR Label

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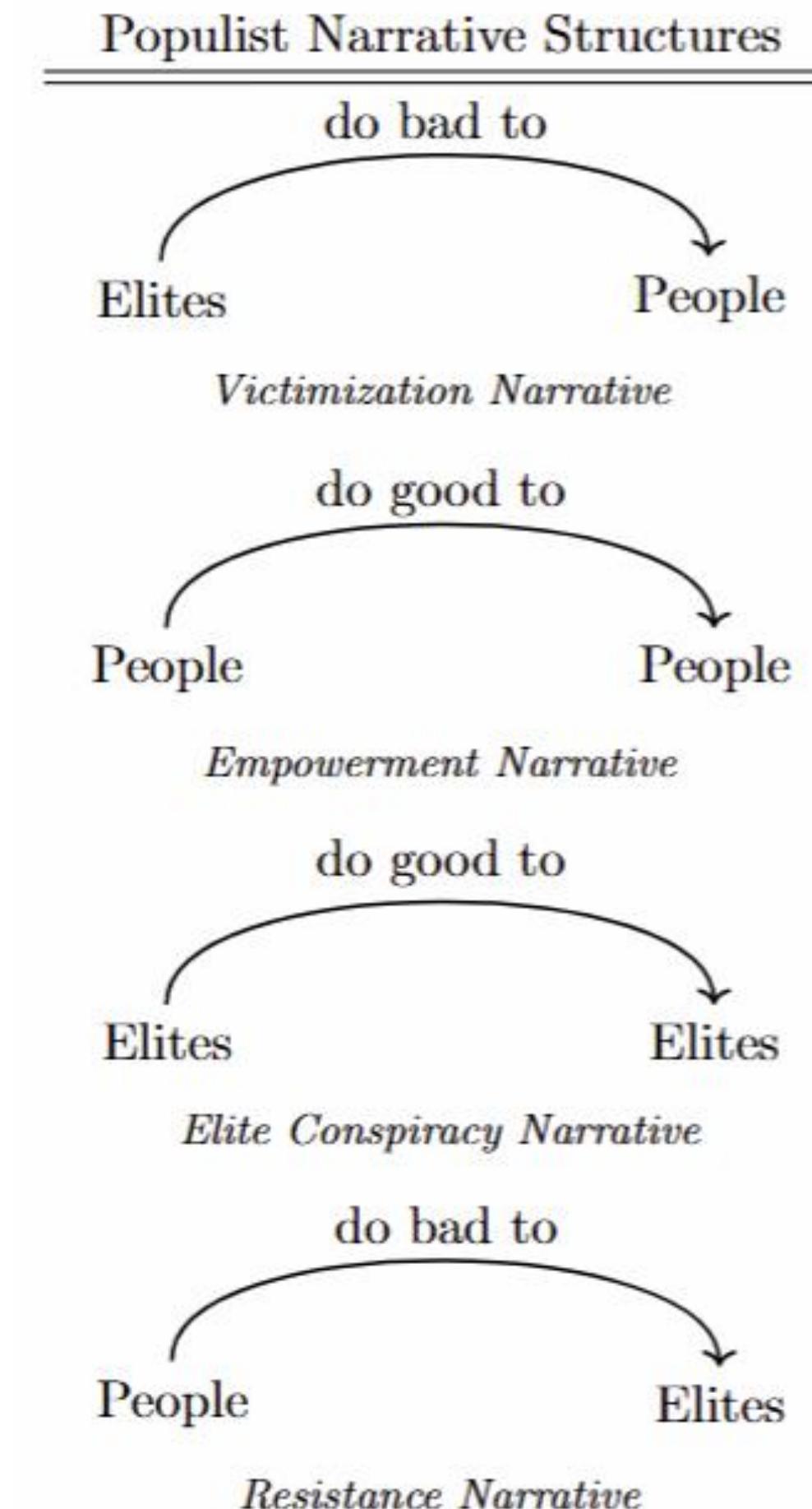
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- Four representative **populist narrative structures**

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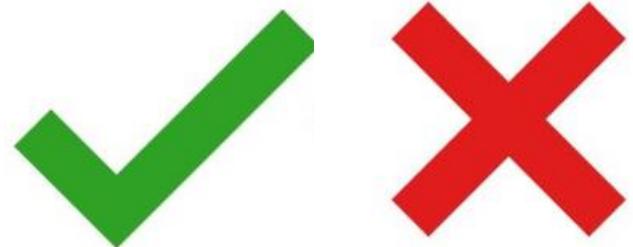
Actor-US / Target-US  
Actor-THEM / Target-THEM



### *Judgment*

Morally good / bad

Judgment-on-aspect (+ / - valence)



### *Perspective*

Speaker / Non-speaker perspective   Judgment-holder (Speaker / Non-speaker)

# The Structure of Populism as Graph Motif

We measure populist **narrative structures**:

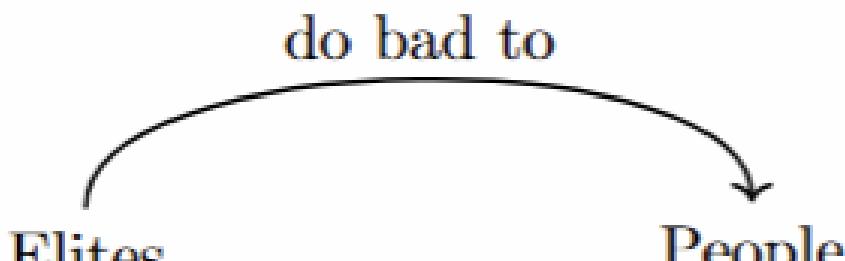
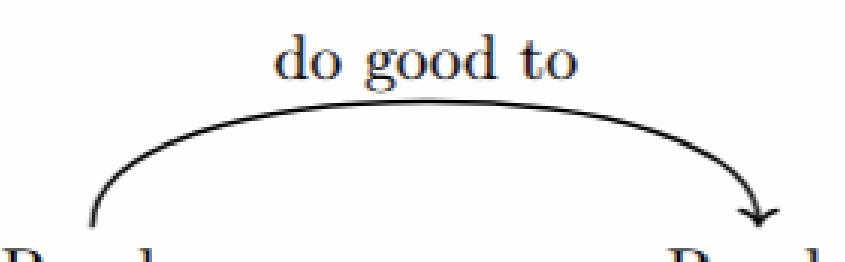
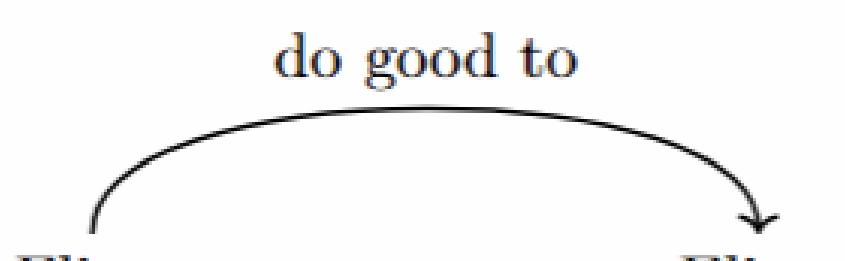
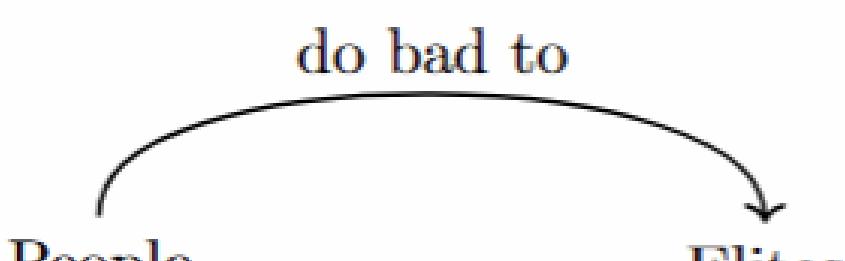
→ Labels

→ Actor vs Target

→ Valence

→ Perspective

Four representative **populist motifs**

Populist Narrative Structures	Populist-PULSAR Graph Motif
 <i>Victimization Narrative</i>	Speaker(Them, -, Us)
 <i>Empowerment Narrative</i>	Speaker(Us, +, Us)
 <i>Elite Conspiracy Narrative</i>	Speaker(Them, +, Them)
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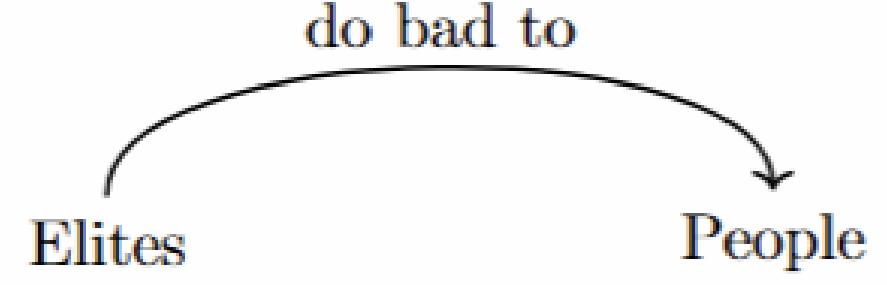
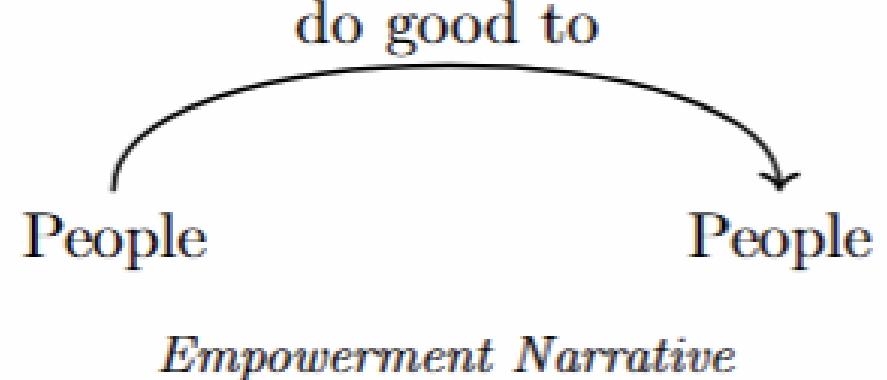
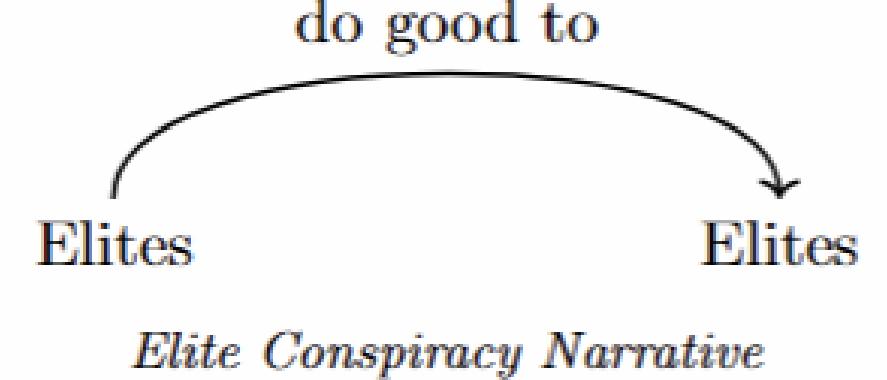
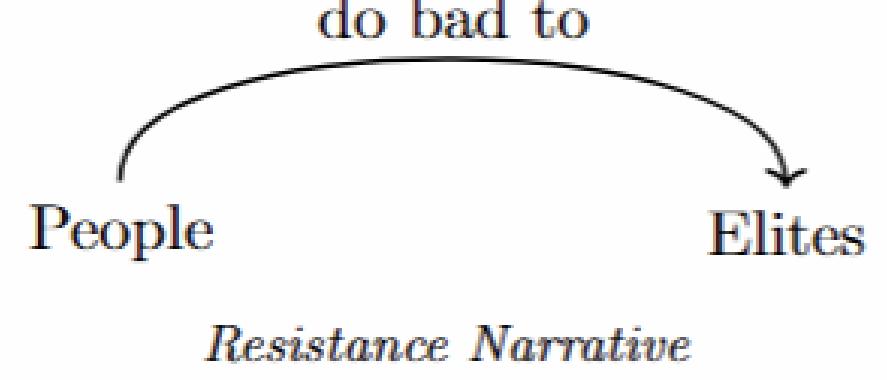
→ Labels (nodes)

→ Actor vs Target (edge direction)

→ Valence (edges)

→ Perspective (graph attribute)

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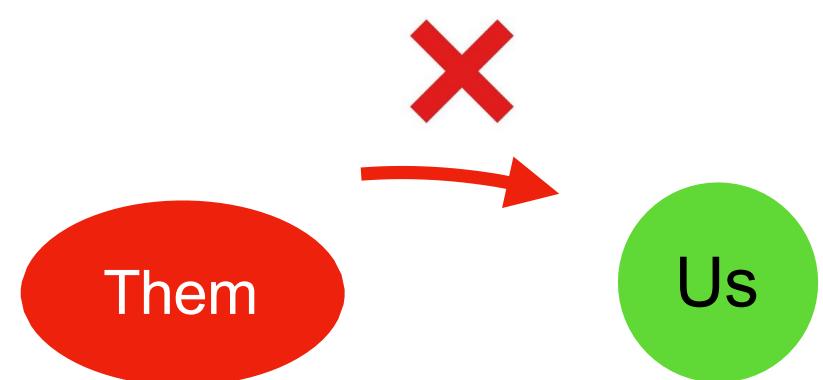
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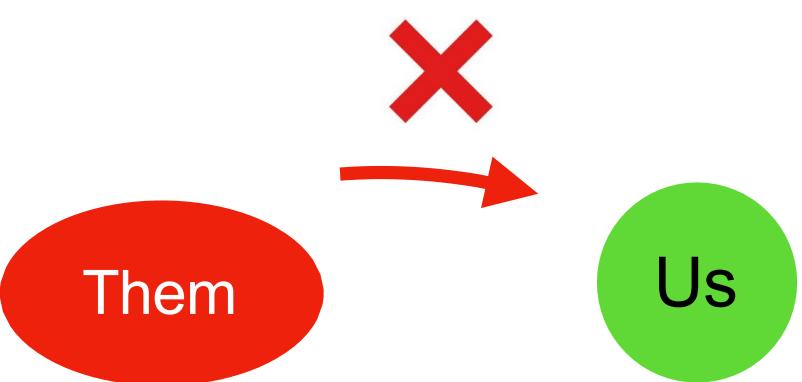
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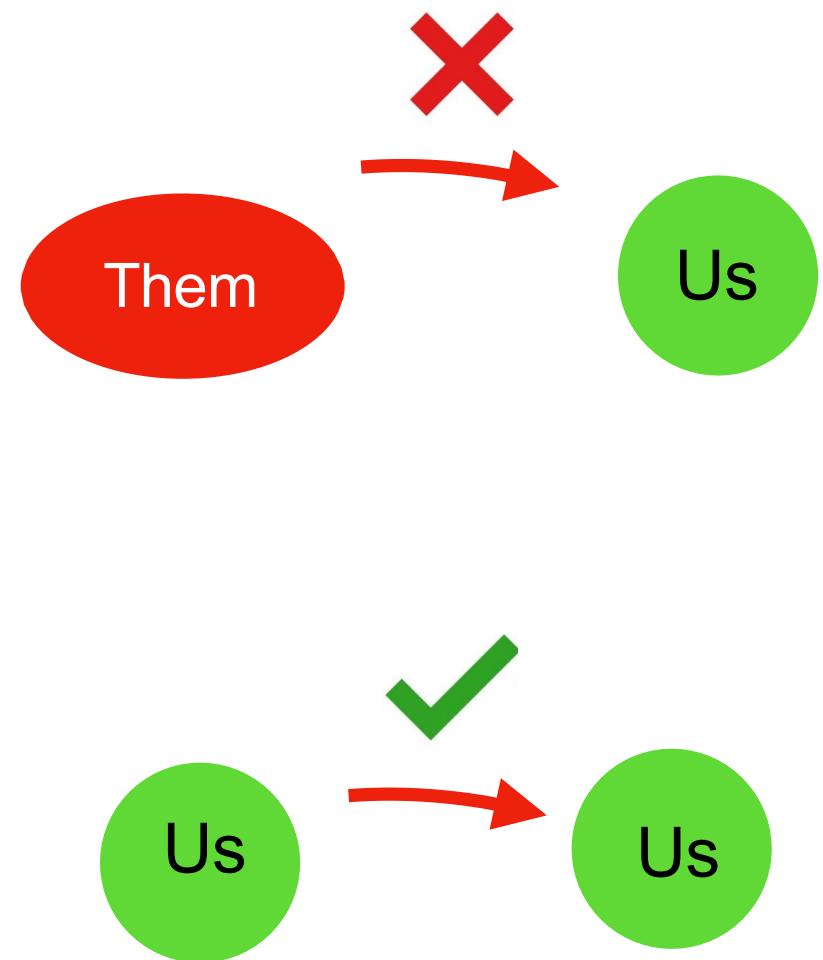
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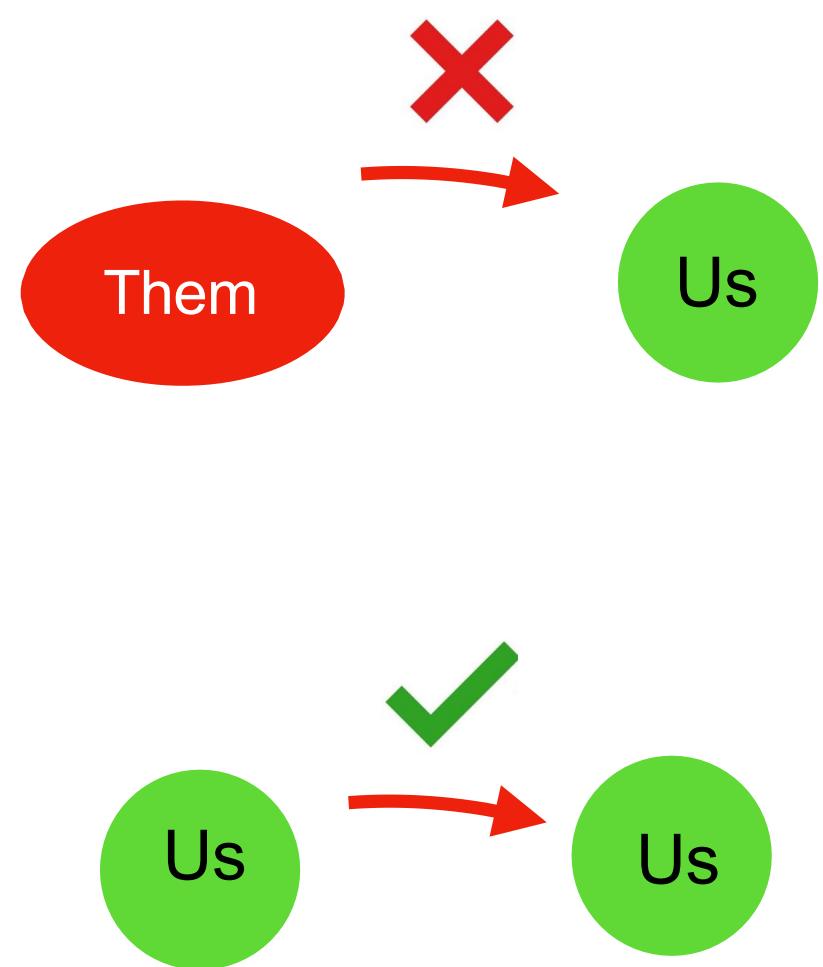
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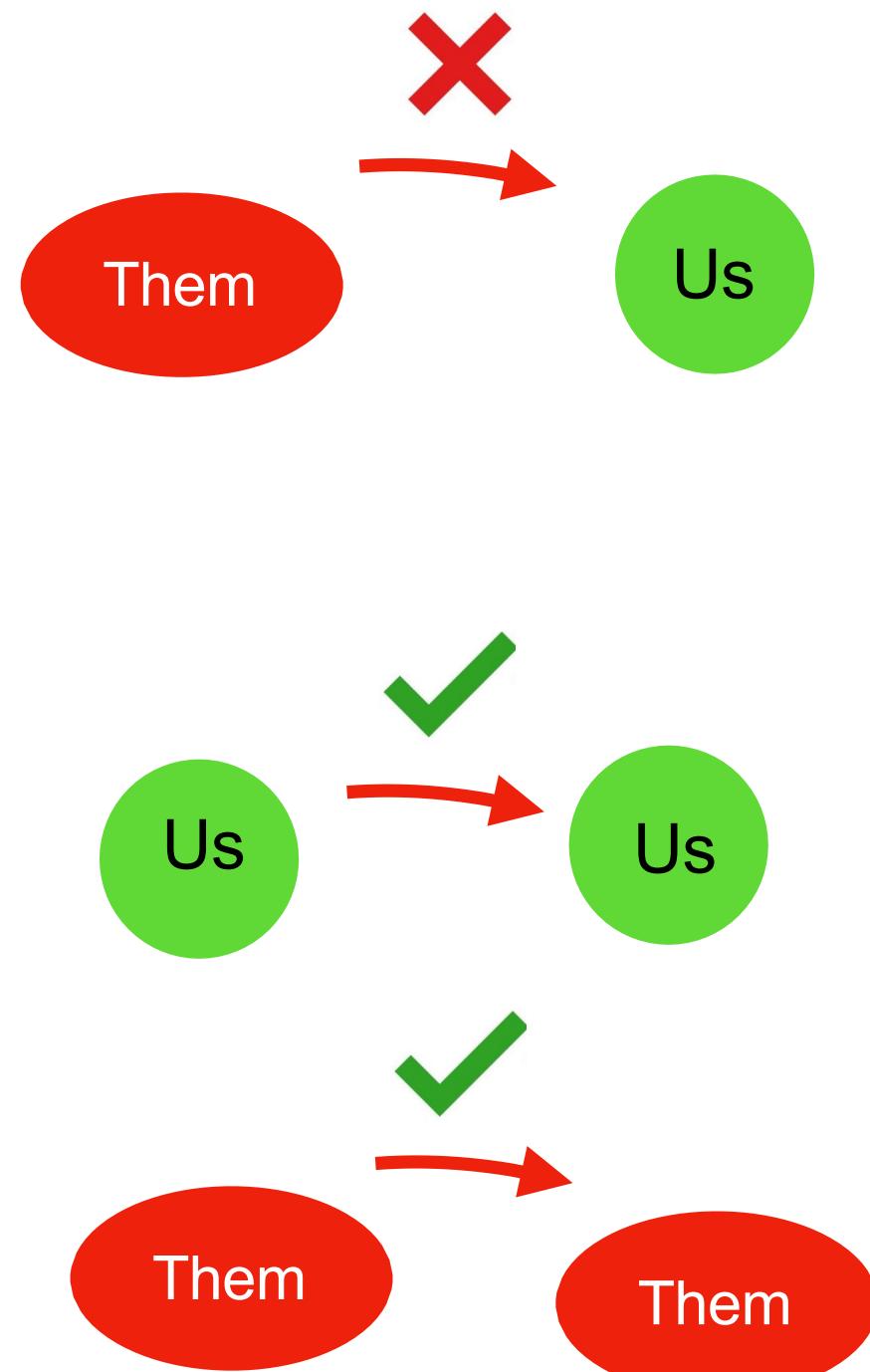
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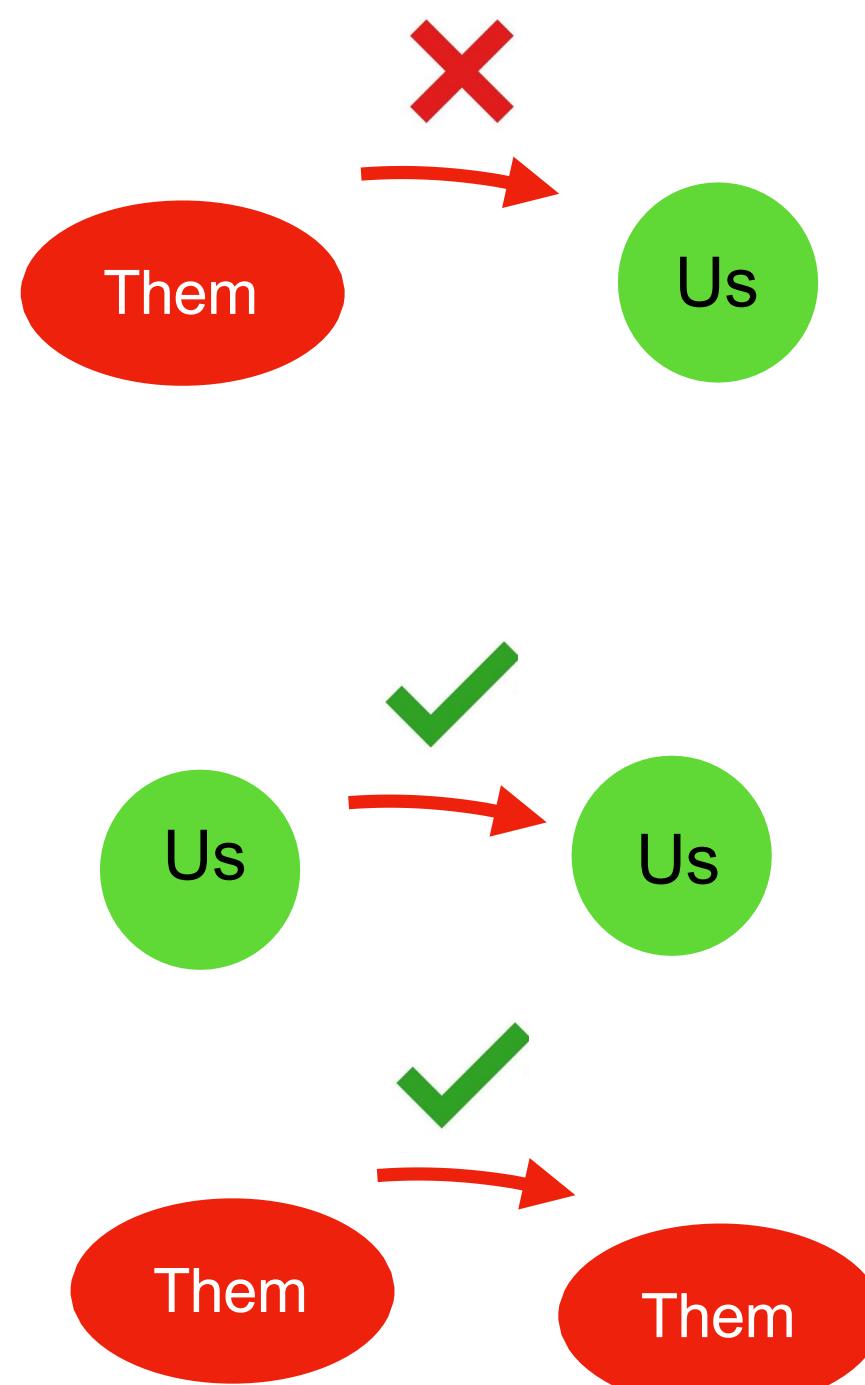
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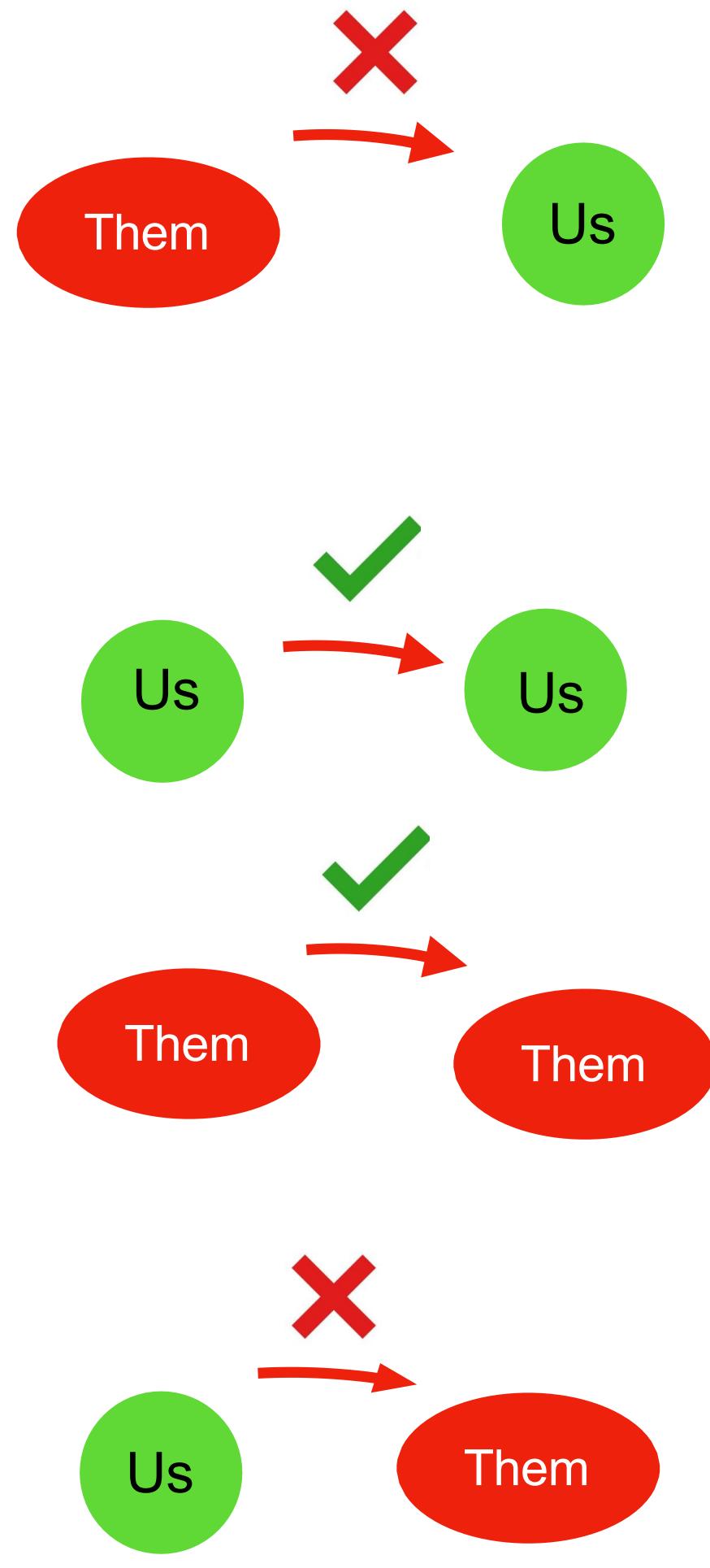
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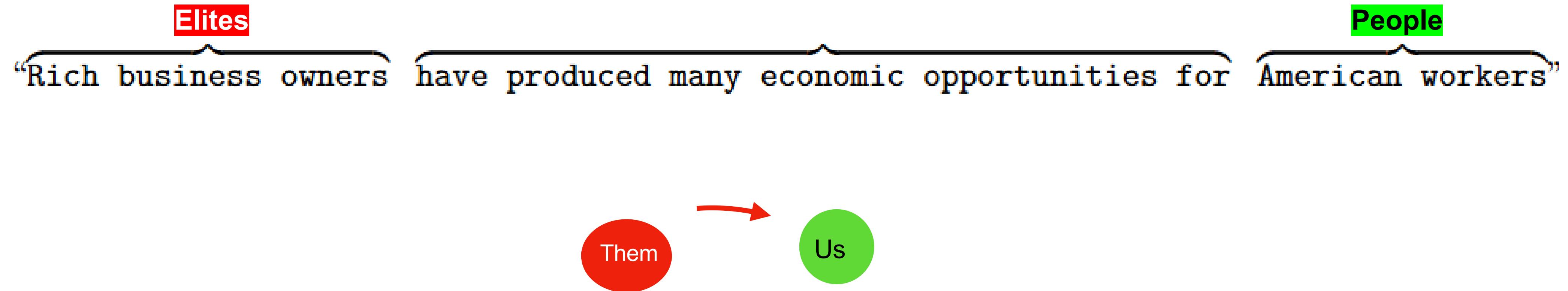
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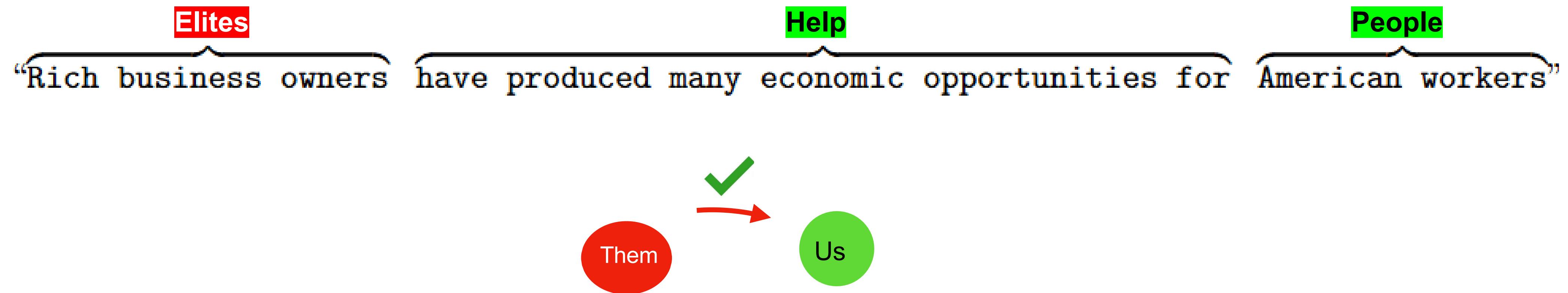
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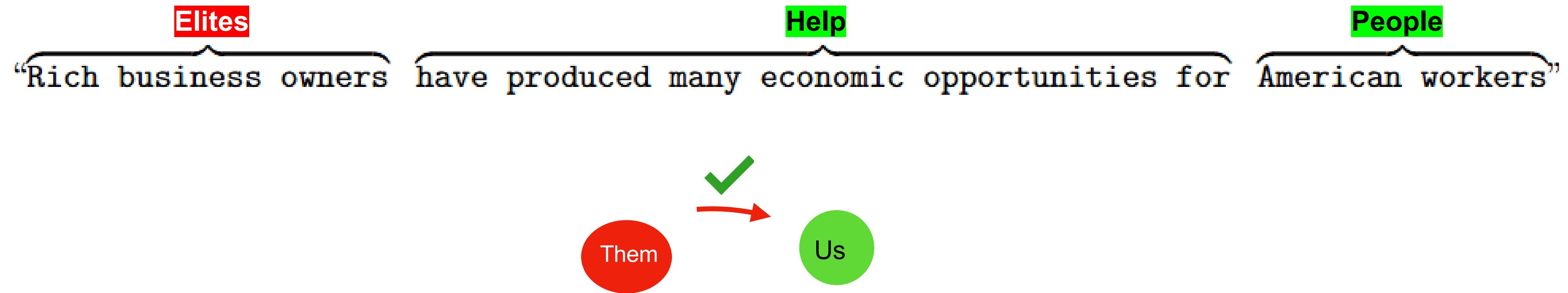
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*(Contains populist elements but arranged incorrectly.)*

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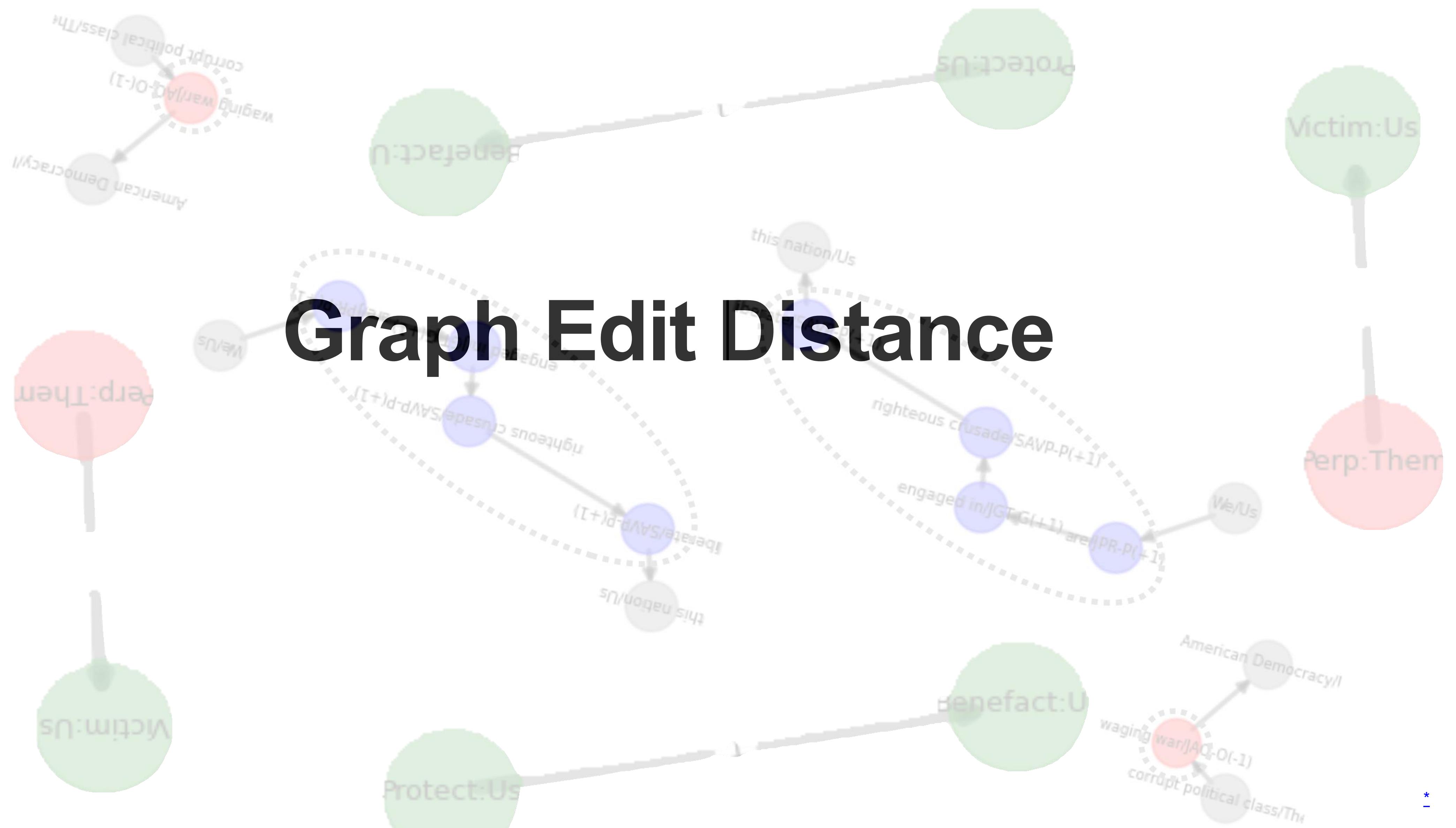
"In the new McLaughlin Poll of Nevada we're at 75% while DeSanctimonious is at 60 points behind us. He's at 15, so think of that, we're at 75, just came out. We're at 75. The DeSanctimonious is at 15, so we're leading by 60 points. But here's the thing you got to do, [inaudible 00:30:11], just go vote. Don't think about it. Pretend we're tied, pretend we're losing by three. You got to do this because the worst thing is everyone thinks, "Oh, what do we have to vote for? Trump is killing them, and then bad things happen when that..." Pretend we're losing. Assume that we're down by three, four, or five, okay? You don't want to do what the Washington Post does and others where they make it so that it doesn't make sense. In Wisconsin for two elections, they put me down in Wisconsin at 17, I'm 17 down, right? I said, "No way I'm 17 down. No way."

I asked John McLaughlin the great pollster, I said, "Why would they do that? I'm winning in Wisconsin." He said, "They do that because that way people don't vote." I said, "What do you mean? Well, why don't they do it like at 5:00? Because they do get killed when they lose." He said, "They don't care about that. At 17 people won't vote. They'll say, we love Trump, but we're not going to vote for him. At 5:00 they say, he has a chance. We'll vote." I said, "Wow, that's really sick, huh?" That's what it is. That's how bad they are that we won Wisconsin. They had us down 17 and we won Wisconsin, and then we did, frankly better the second time where we did better in most places the second time. People say, "How'd you do the second time?" I say, "We did much better."

If you take a look, we got millions more votes a second time, and the new Rasmussen Poll of general election we're dominating Biden by 10 points. That's a lot because a friend of mine said, "How come you're only winning by 10 or 14 points? There's another one 14 points." I said, "How could he be possibly that close?" But they have a lot of people voting for them that aren't going to vote for us. But I'll tell you, a lot of the people that would normally vote for them, like the union people are voting for us other than the top people in the unions and even some of the top people in the unions are ~~for~~ing for us, this could be an incredible situation. African Americans, we have the highest poll numbers we've ever had. Hispanic Americans, we have the highest poll numbers ... Republican Party has ever had.

... We can handle that if we have the right president, but what's very difficult are these corrupt communists that we have within our own country. They're very dangerous people, and you must never forget, this nation does not belong to them. This nation belongs to you, it belongs to you. This is your home. This is your heritage, and our American liberty is your God-given right.

# Graph Edit Distance



# Matching Extracted Structures to Populist Motifs via GED

- Purpose: Quantify **closeness** of extracted **graphs** to populist motifs

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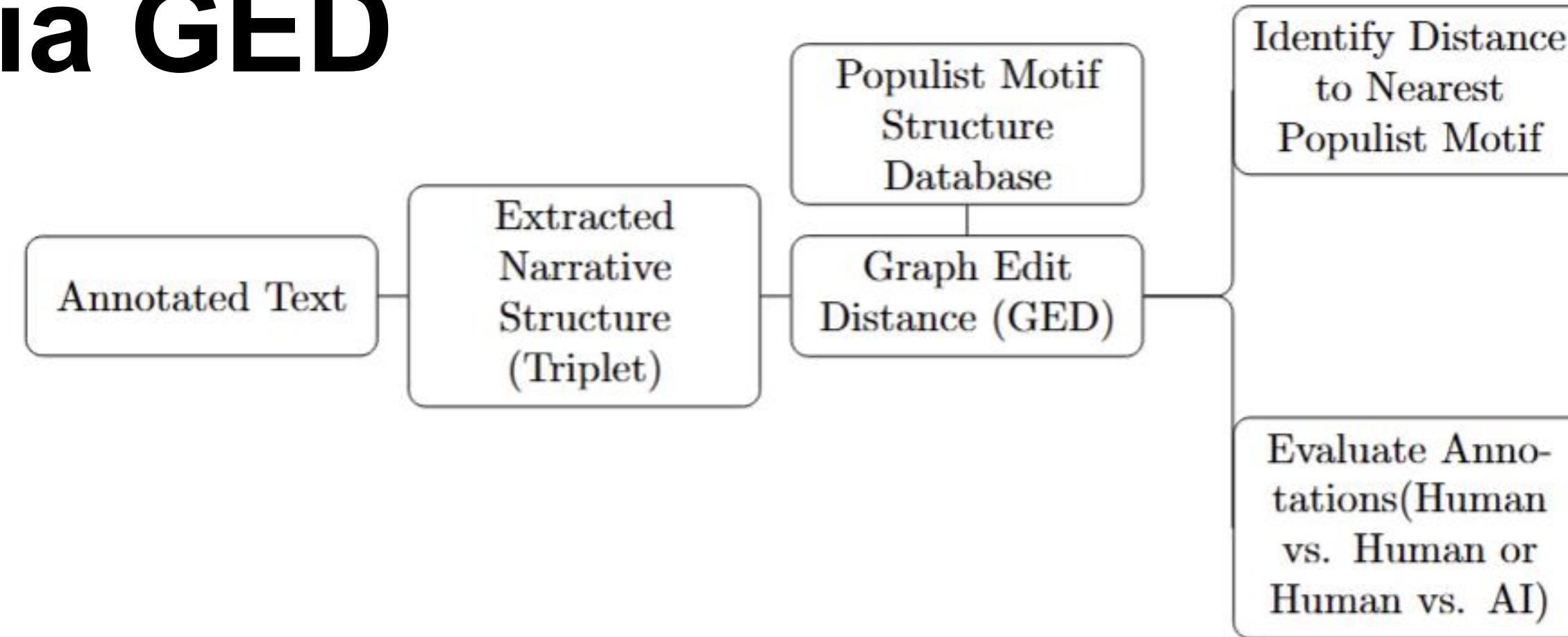
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- **Advantages:**
  - Captures **substantive alignment** beyond superficial wording
  - **Flexibility:** Allows partial matches and exact matching as special cases
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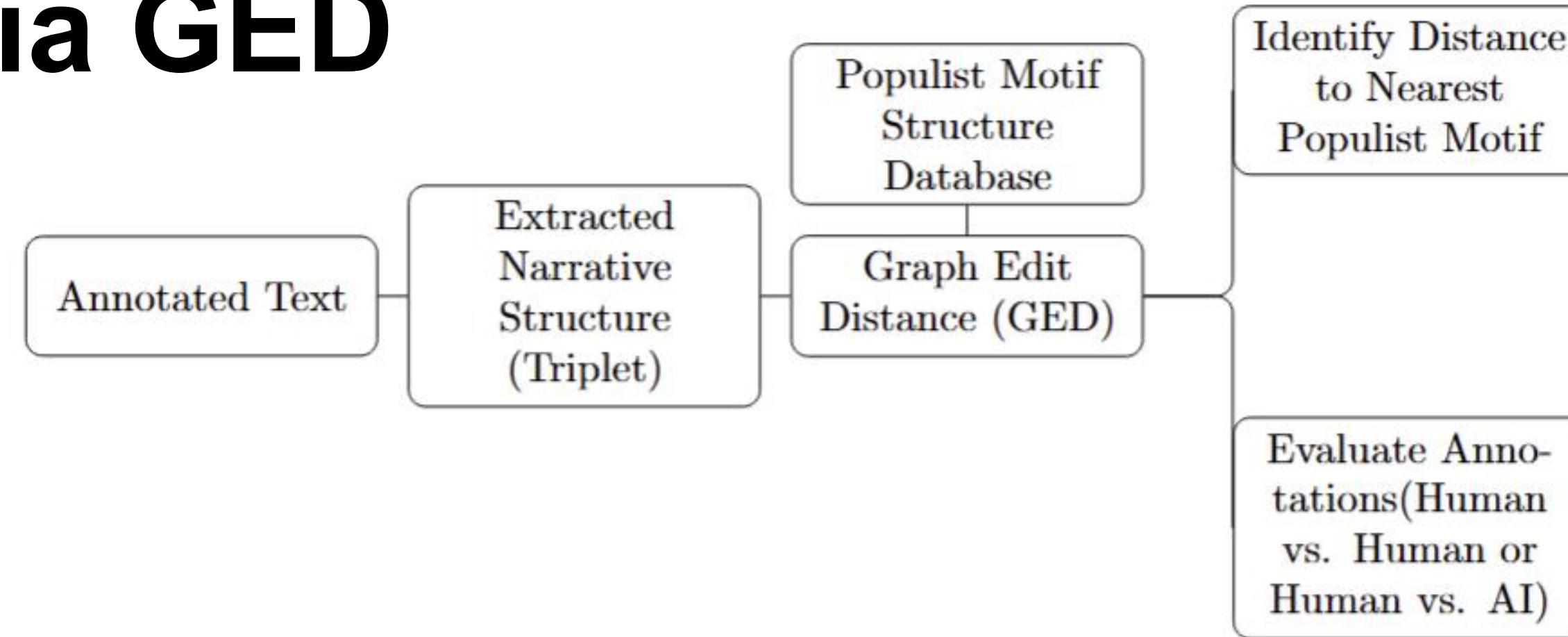
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  - **Flexibility:** Allows partial matches and exact matching as special cases
  - **Evaluation:** Compares automated extraction to human annotations
- **Distance Calculation:** **Penalizes significant shifts** in actors, targets, or valence

# Matching Extracted Structures to Populist Motifs via GED



# Matching Extracted Structures to Populist Motifs via GED



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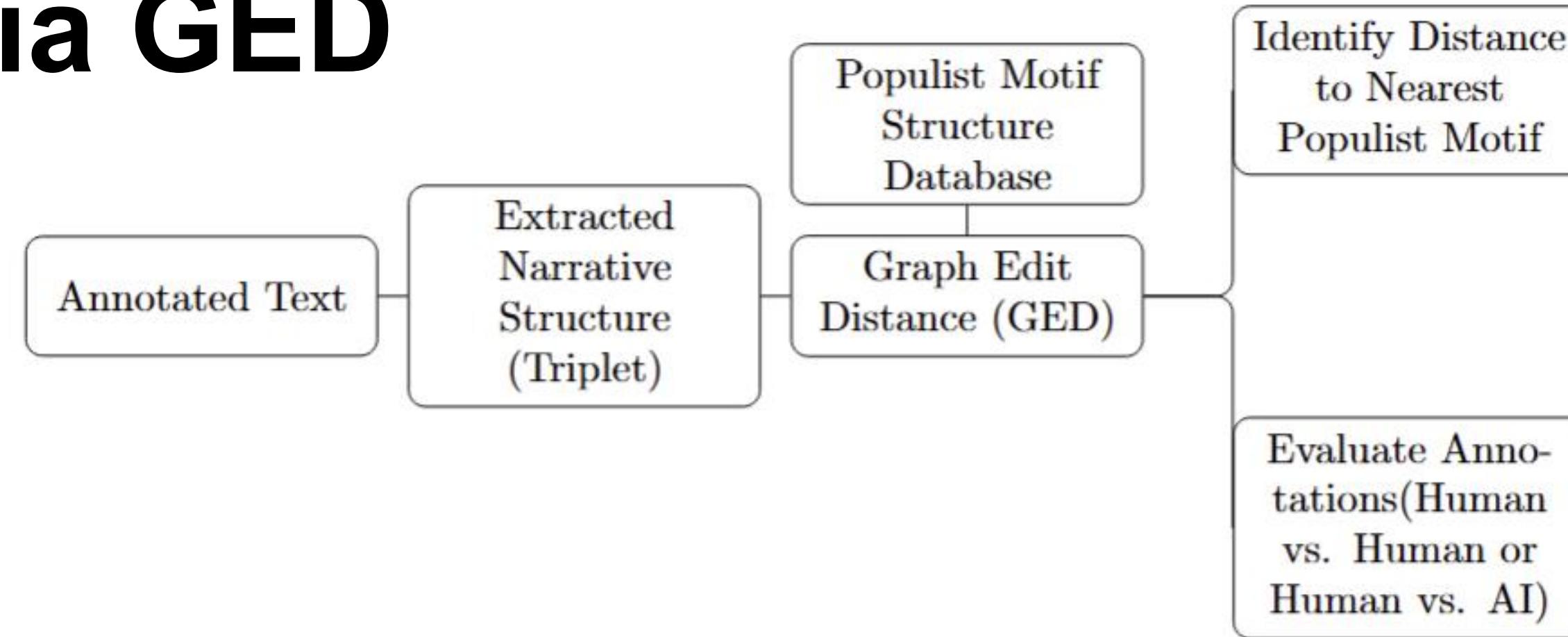
## Sentence Example

---

**Empowerment Reference:** “*We will bring back our borders*”

ACTOR (US)      JUDGMENT (+1)      TARGET (US)      Aspect (+1)  
  We           will bring back       our           borders

# Matching Extracted Structures to Populist Motifs via GED



## Sentence Example

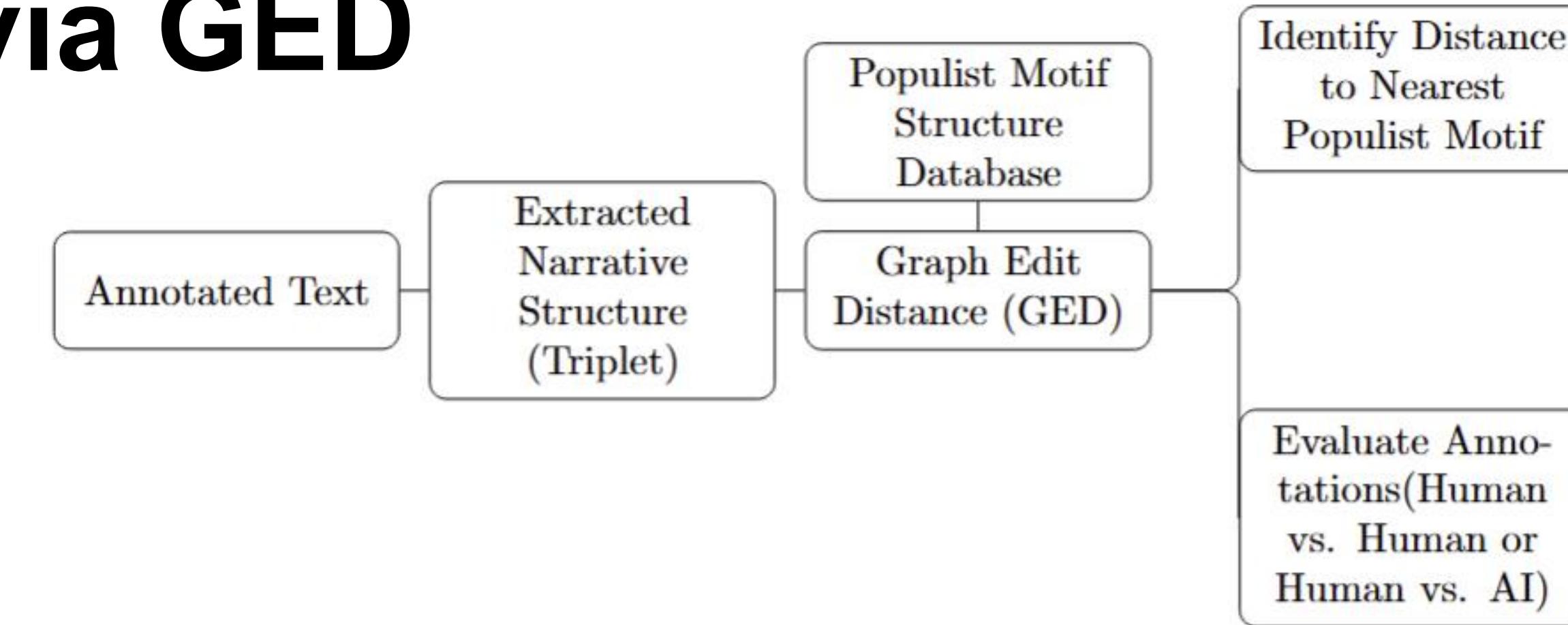
Empowerment Reference: “*We will bring back our borders*”

## Triplet

(US, +, US)

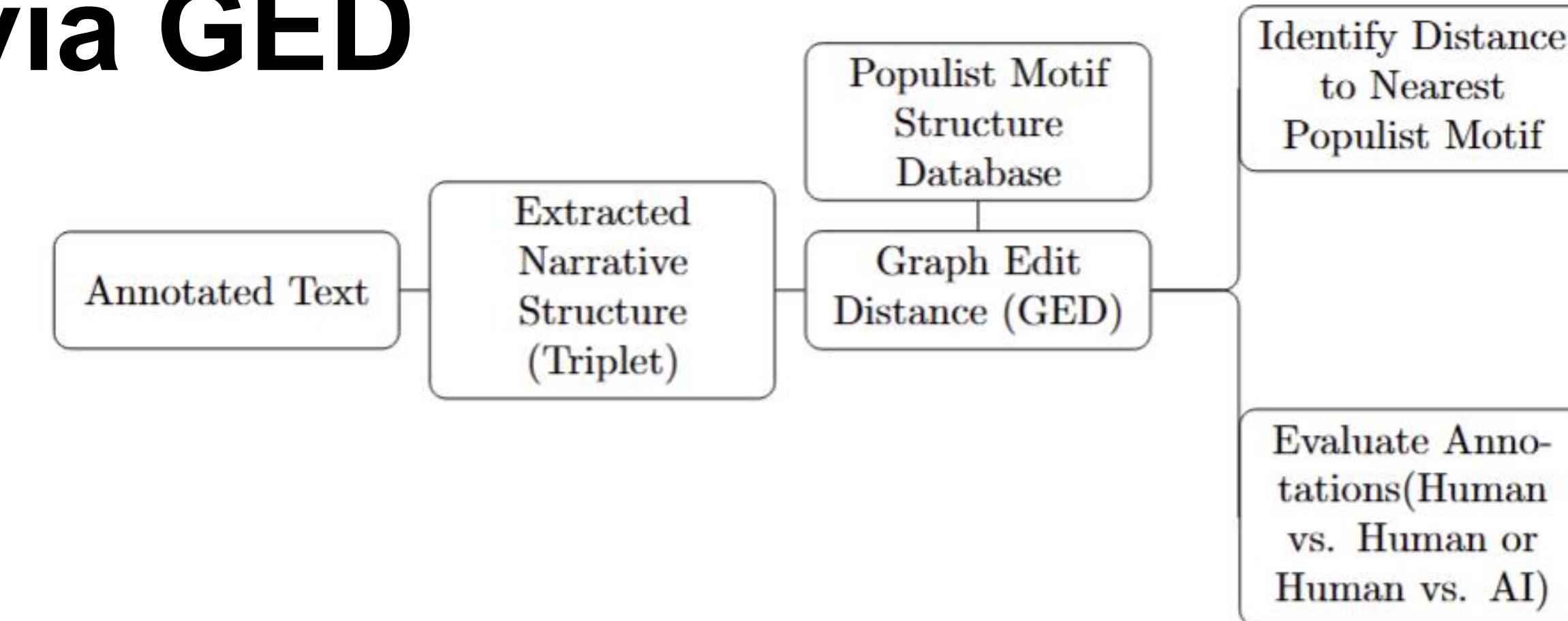
ACTOR (US)      JUDGMENT (+1)      TARGET (US)      Aspect (+1)  
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# Matching Extracted Structures to Populist Motifs via GED



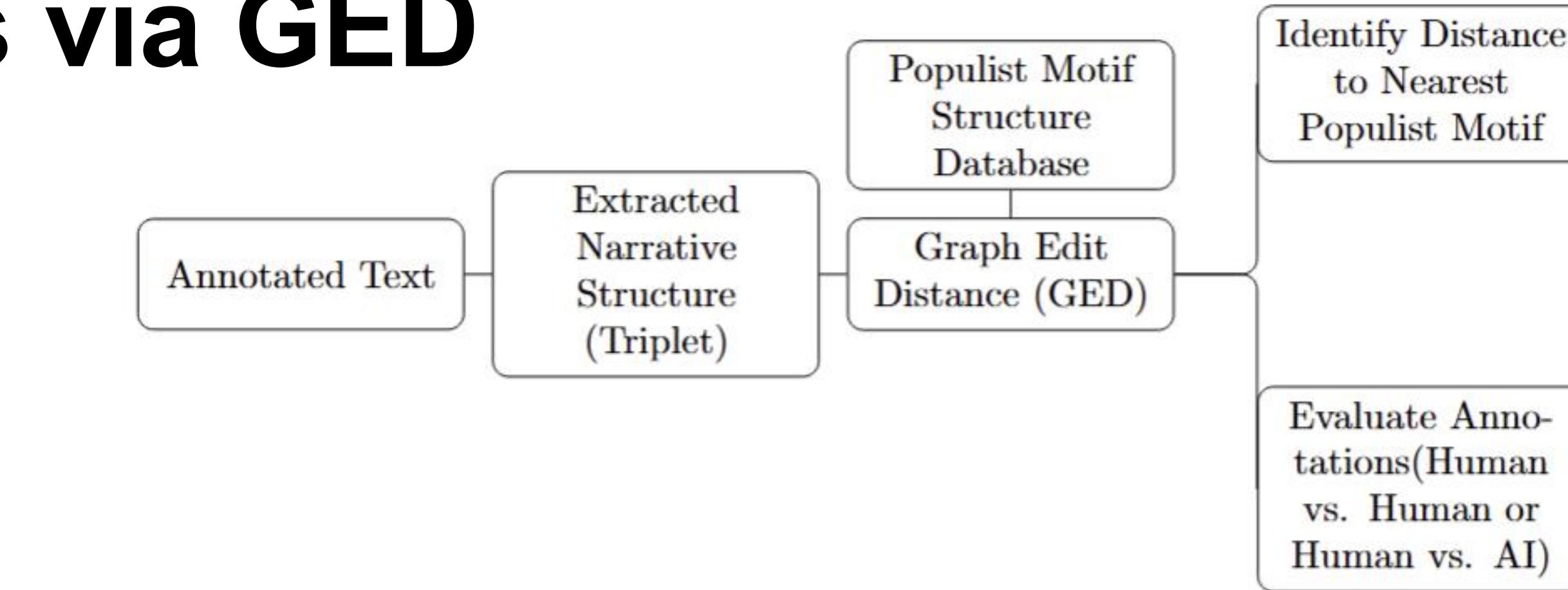
Sentence Example	Triplet	Penalization	GED to Ref.
<b>Empowerment Reference:</b> "We will bring back our borders"	(US, +, US)		
ACTOR (US)      JUDGMENT (+1)      TARGET (US)      Aspect (+1) <u>We</u> <u>will bring back</u> <u>our</u> <u>borders</u>			

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<b>Comparison</b> “We will bring back our jobs”	(US, +, US)	(0,0,0)	0
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Sentence Example	Triplet	Penalization	GED to Ref.
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ACTOR (US)      JUDGMENT (+1)      TARGET (US)      Aspect (+1) <u>We</u> <u>will bring back</u> <u>our</u> <u>jobs</u>			
<b>Comparison</b> “We have to stop them from cheating in elections.”	(US, -, THEM)	(0,4,2)	6
ACTOR (US)      JUDGMENT (-1)      TARGET (THEM)      ASPECT (+1) <u>We</u> <u>have to stop</u> <u>them</u> <u>from cheating in elections</u>			*

# Our Approach: Making Populist-PULSAR Accessible at Scale

# Making Populist-PULSAR Accessible at Scale

- **Challenge:** Manual annotation costly at large scale

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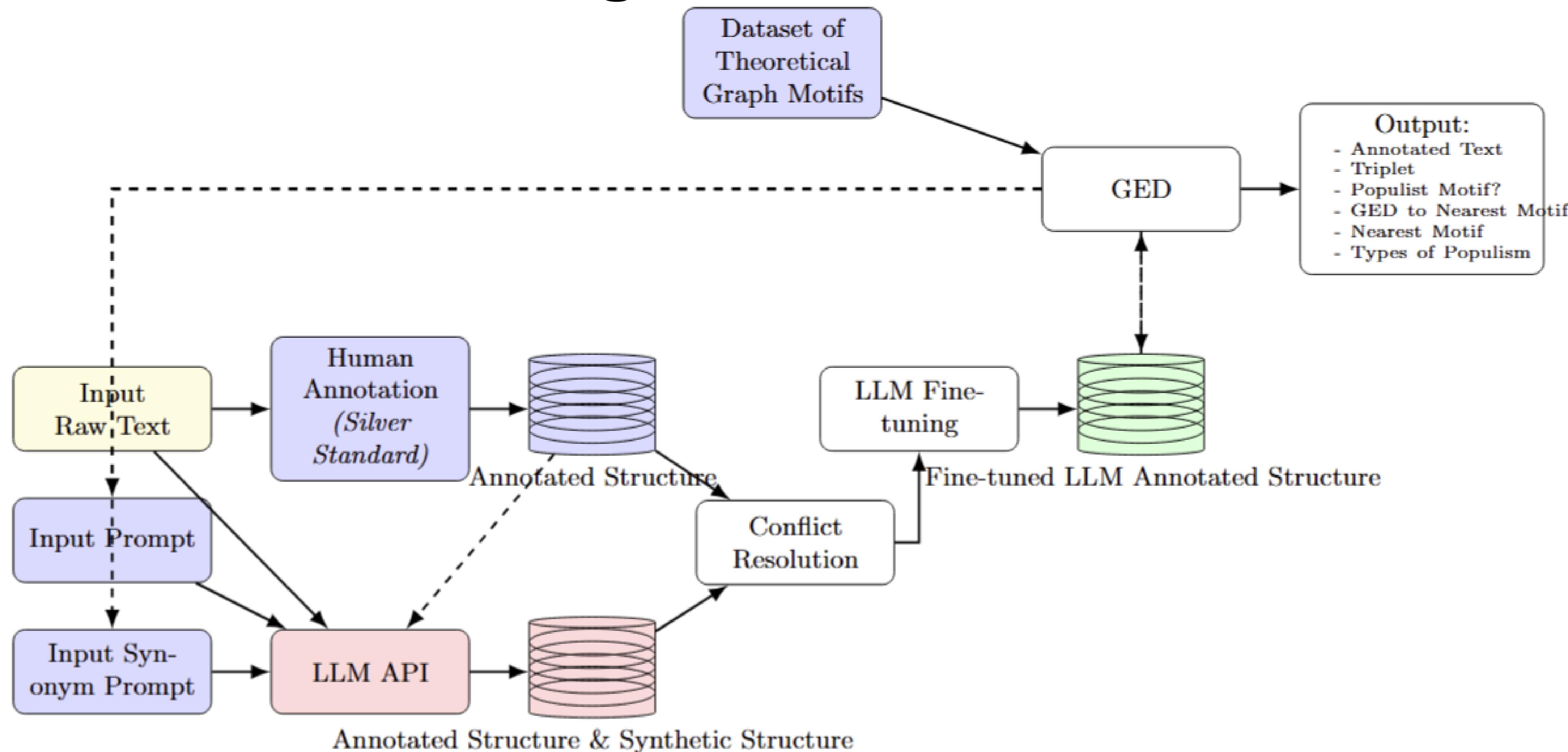
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- **Annotation Expansion:**
  - Prompt-based annotations via LLMs
  - Synthetic data generation

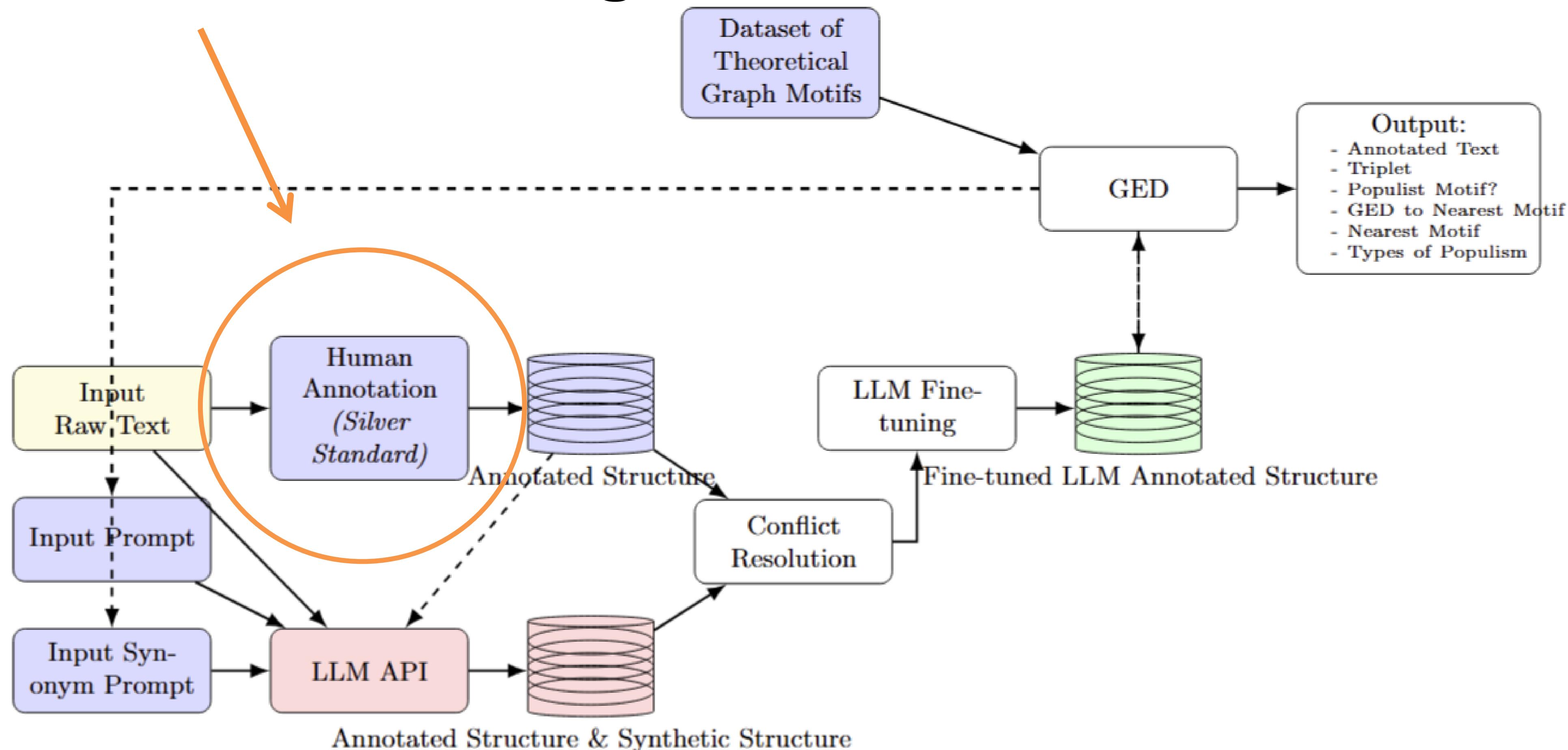
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  - Synthetic data generation
- **Data Scope:** U.S. political speeches (2008-present)

# The Computational Steps from Unannotated Texts to Extracting Narrative Structure



# The Computational Steps from Unannotated Texts to Extracting Narrative Structure



# Hand-annotate using Prodigy system



For the last eight years, President Trump has given everything he has



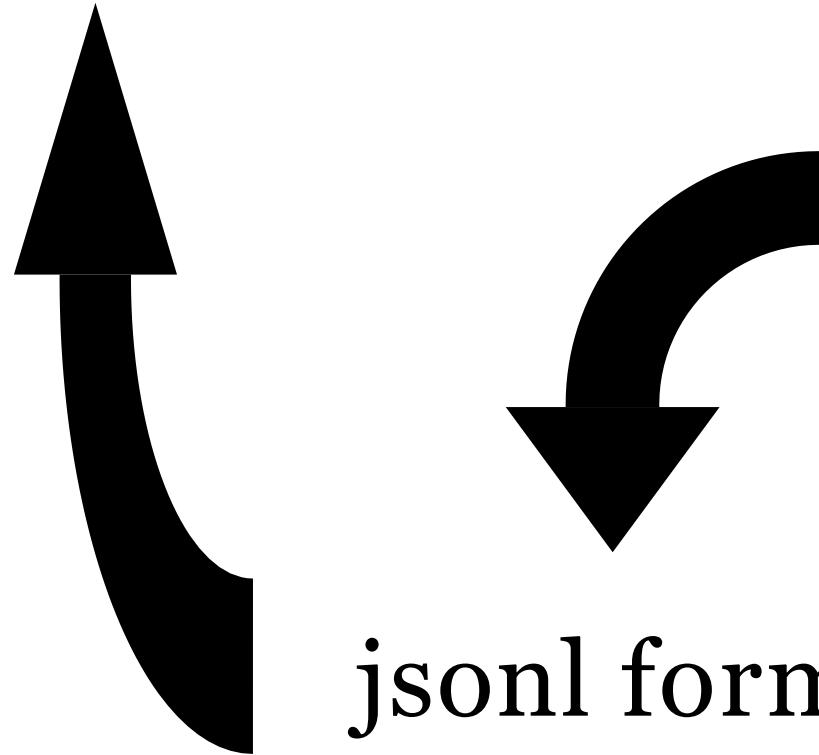
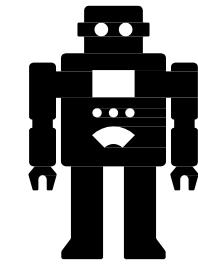
to fight for the people of our country.



SOURCE: Vance\_RNC\_2024 POPVAL: 1

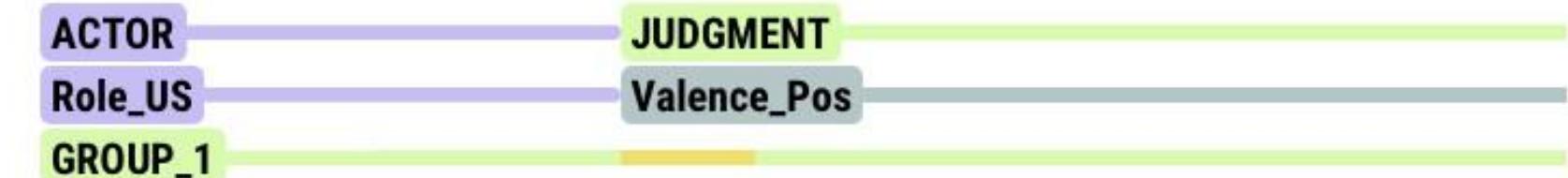
# Hand-annotate using Prodigy system

Input to few-shot  
LLM to label



ACTOR 1	TARGET 2	JUDGMENT 3	ASPECT 4
JUDGMENT HOLDER 5	VALENCE_POS 6	VALENCE_NEG 7	
VALENCE_NEU 8	ROLE_US 9	ROLE_THEM 10	GROUP_1 11
GROUP_2 12	GROUP_3 13	GROUP_4 14	GROUP_5 15
GROUP_6 16	GROUP_7 17	GROUP_8 18	

For the last eight years, President Trump has given everything he has



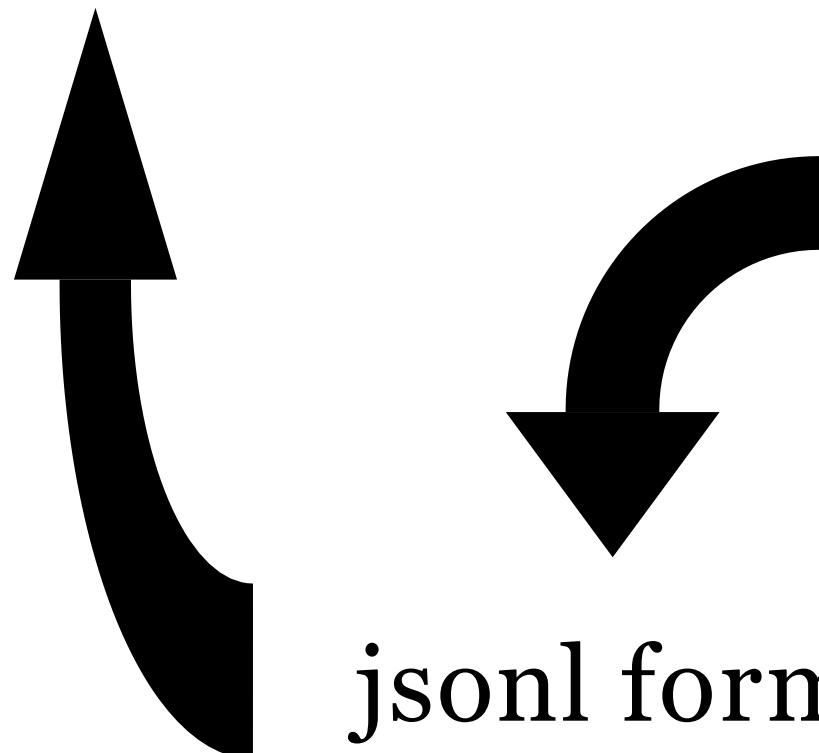
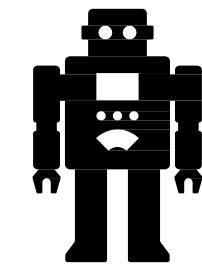
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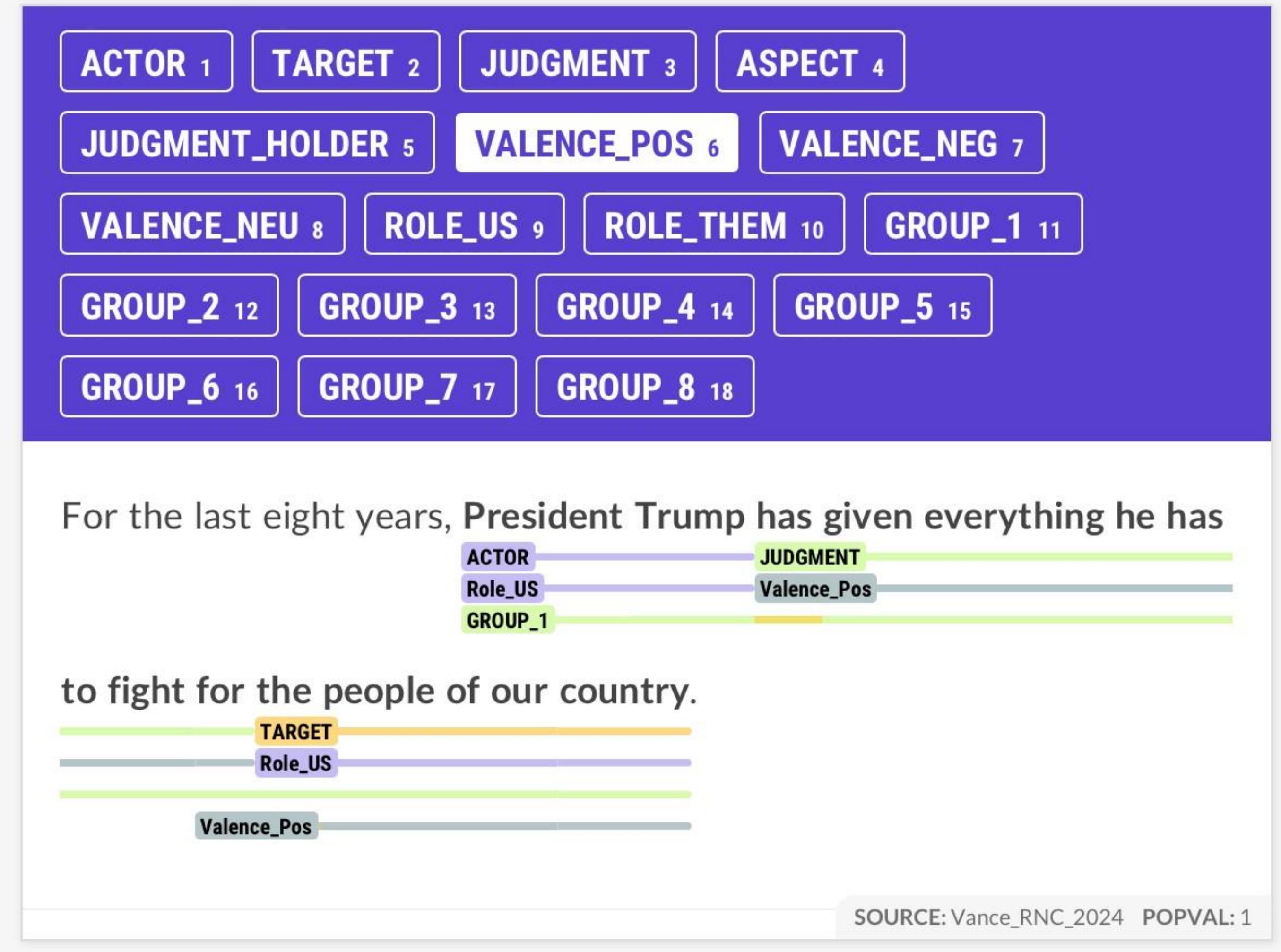
Input to few-shot  
LLM to label



Human  
readable



(President Trump, +1, people of our country)



The interface shows a grid of 18 entity types with IDs 1 to 18:

ACTOR 1	TARGET 2	JUDGMENT 3	ASPECT 4
JUDGMENT HOLDER 5	VALENCE_POS 6	VALENCE_NEG 7	
VALENCE_NEU 8	ROLE_US 9	ROLE_THEM 10	GROUP_1 11
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GROUP_6 16	GROUP_7 17	GROUP_8 18	

Below the grid, a sentence is annotated:

For the last eight years, President Trump has given everything he has to fight for the people of our country.

Annotations for the first part of the sentence:

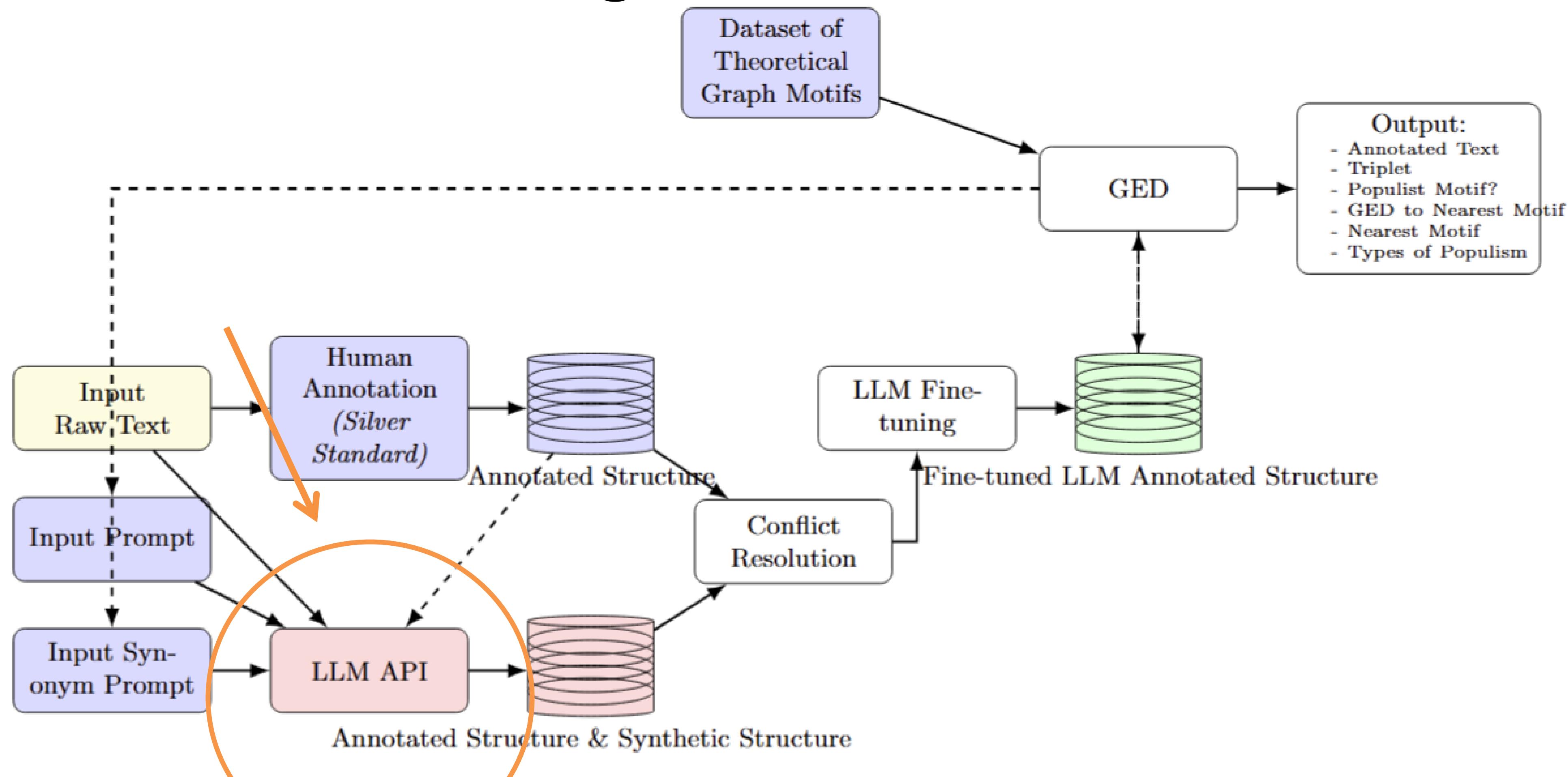
- Actor: President Trump (highlighted in purple)
- Judgment: has given everything he has (highlighted in green)
- Role\_US: President Trump (highlighted in purple)
- Valence\_Pos: has given everything he has (highlighted in grey)
- Group\_1: everything (highlighted in green)

Annotations for the second part of the sentence:

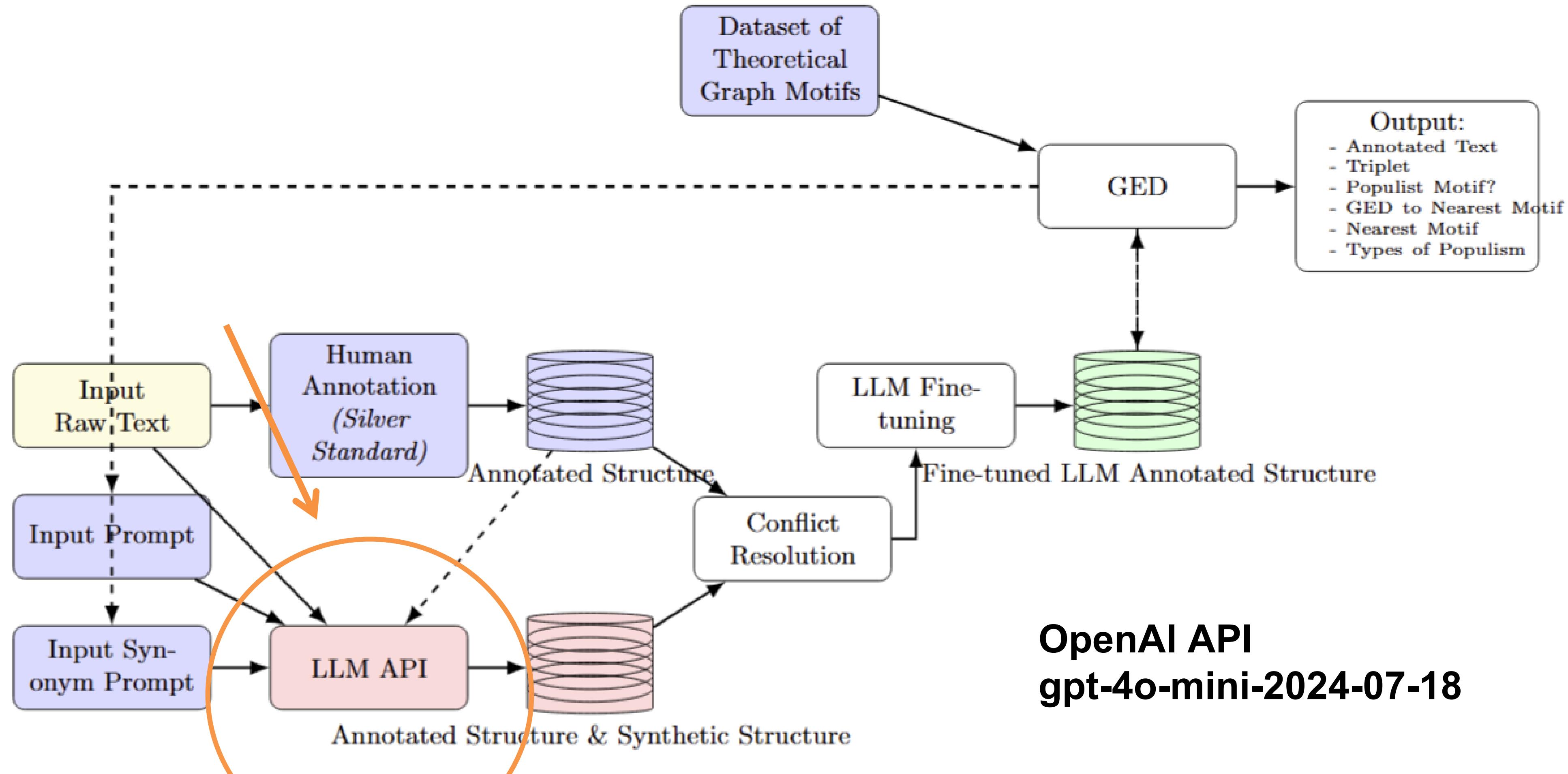
- Target: people of our country (highlighted in orange)
- Role\_US: people of our country (highlighted in purple)
- Valence\_Pos: people of our country (highlighted in grey)

SOURCE: Vance\_RNC\_2024 POPVAL: 1

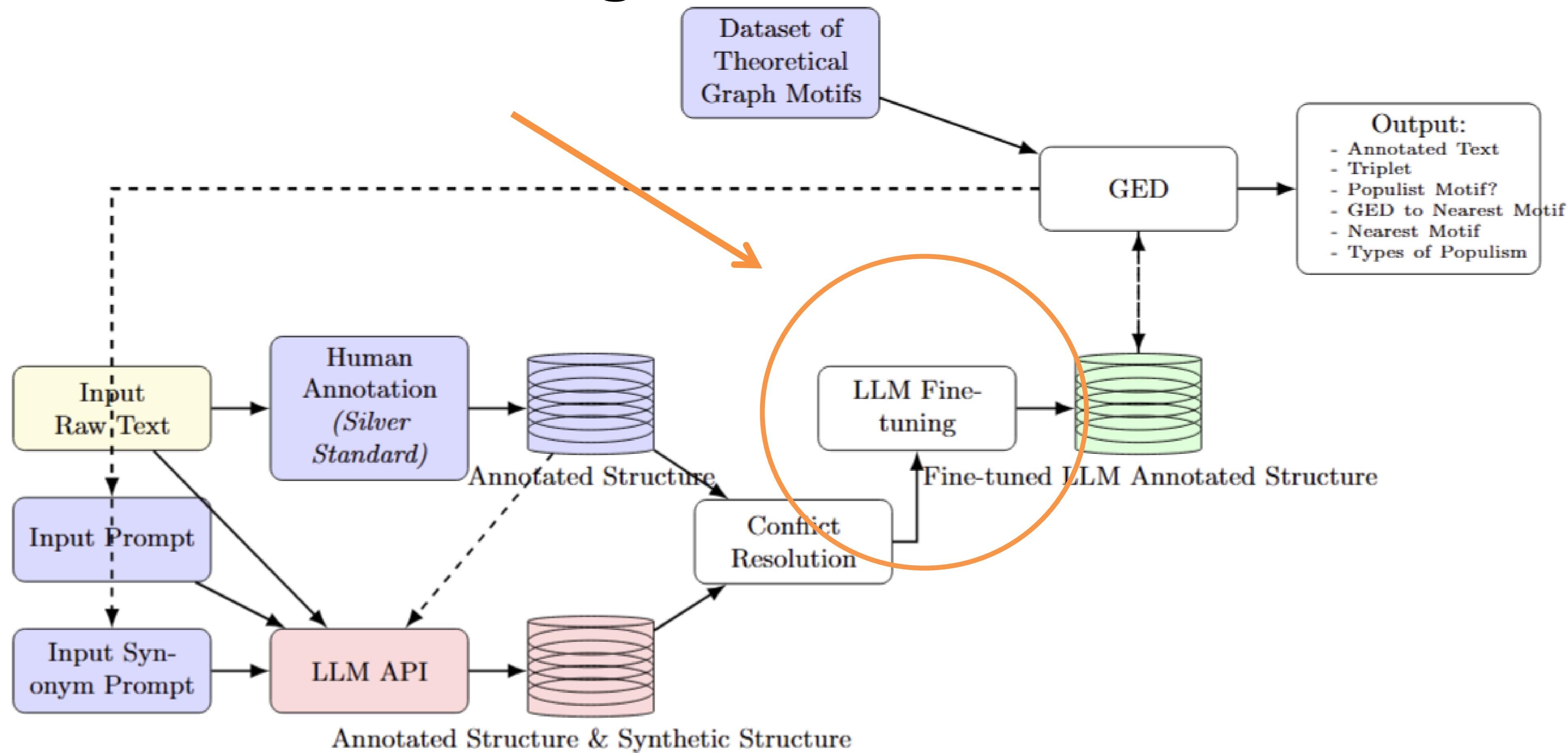
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# Fine-tunning Our Models - PyTorch

**Sentence-Level Approach**

**Token-Level Approach**

# Fine-tunning Our Models - PyTorch

## Sentence-Level Approach

- DistilBERT multi-task fine-tuning
- Binary classification for each label
- Joint optimization

## Token-Level Approach

- Separate BERT models for BIO tagging
- Identifies precise token spans
- Fine-tuned individually per component

# Fine-tunning Our Models - PyTorch

## Sentence-Level Approach

- DistilBERT multi-task fine-tuning
- Binary classification for each label
- Joint optimization

<b>Label</b>	<b>Attribute</b>	<b>Precision</b>	<b>Recall</b>	<b>F1</b>
<b>Actor</b>	Them	0.86	0.86	0.86
	Residual	0.91	0.91	0.91
	Us	0.93	0.93	0.93
<b>Target</b>	Them	1.00	0.90	0.95
	Residual	1.00	0.83	0.91
	Us	0.88	1.00	0.93
<b>Judgment</b>	-1	0.93	0.87	0.90
	+1	0.89	0.96	0.93
<b>Aspect</b>	-1	0.86	0.55	0.67
	+1	0.59	0.89	0.71

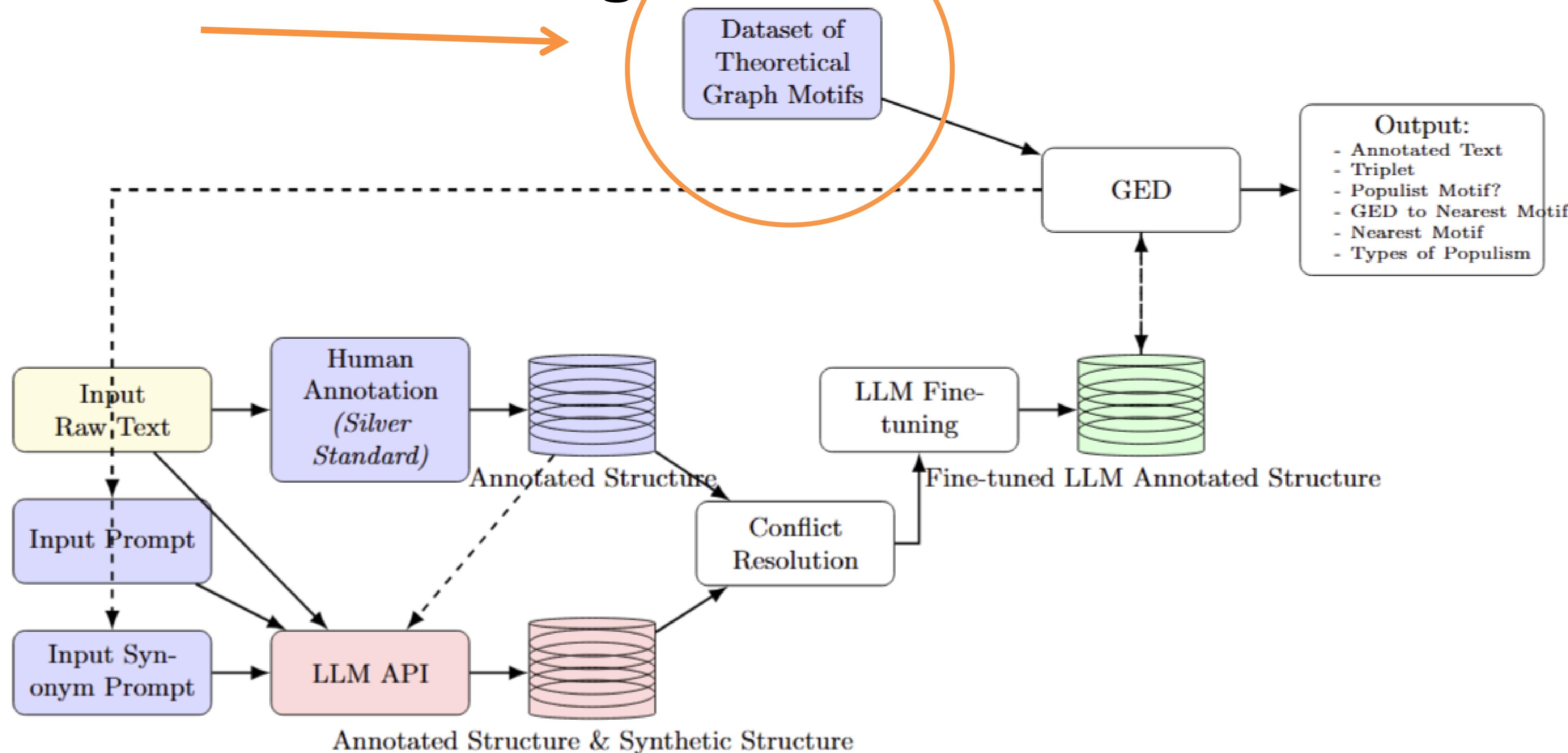
# Fine-tunning Our Models - PyTorch

## Token-Level Approach

- Separate BERT models for BIO tagging
- Identifies precise token spans
- Fine-tuned individually per component

We continue to improve the system and add more training data!

# The Computational Steps from Unannotated Texts to Extracting Narrative Structure

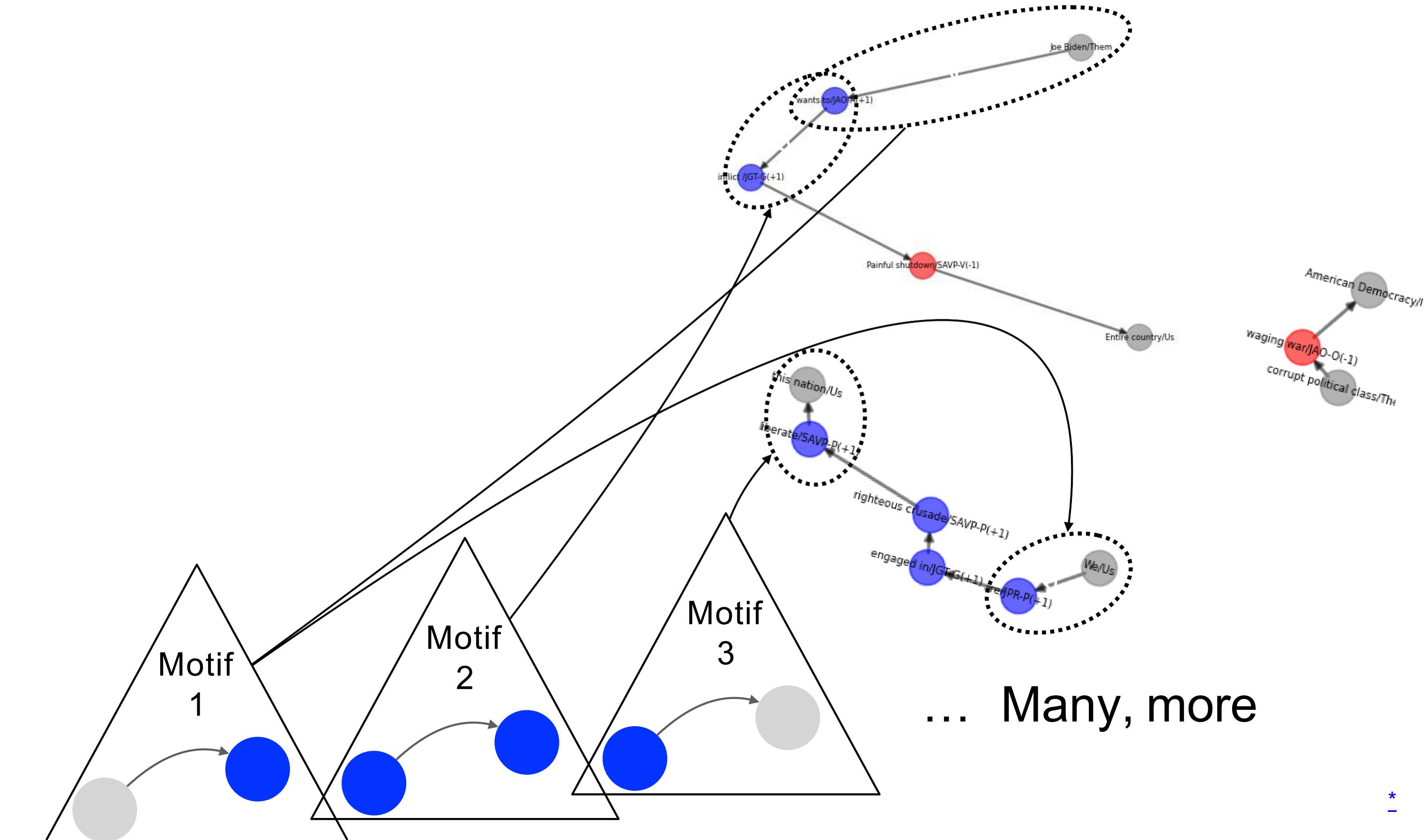


# Populist Narrative Structure

Cast THEORETICAL populist narrative types as network motifs

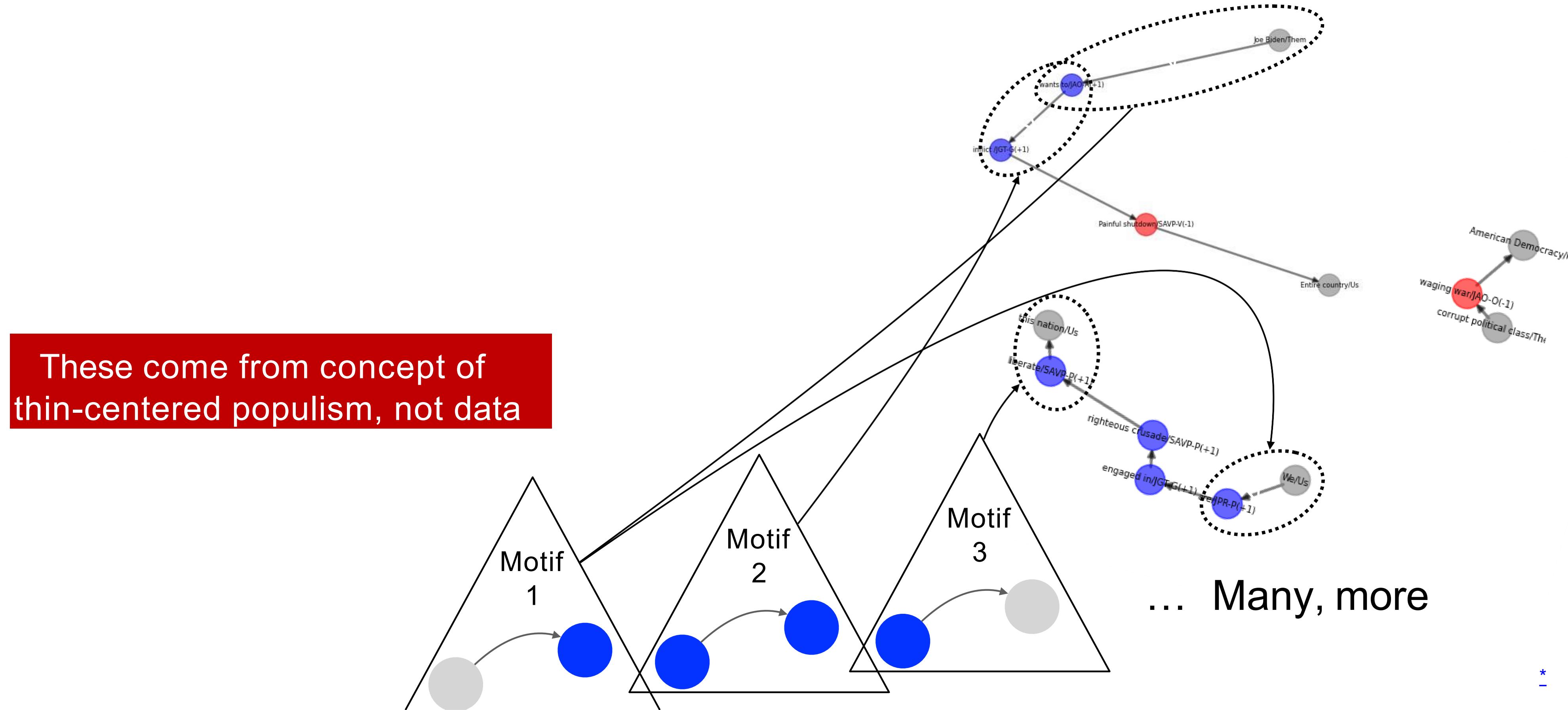
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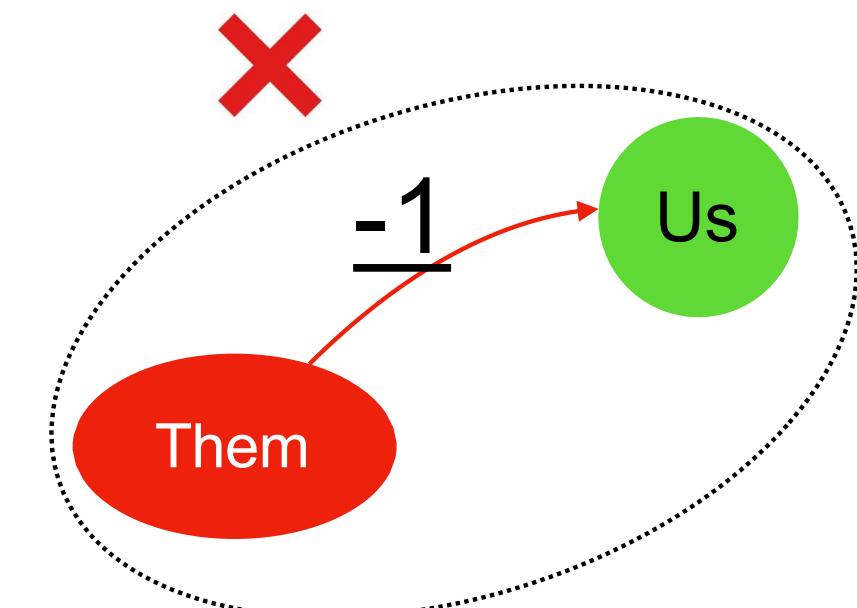
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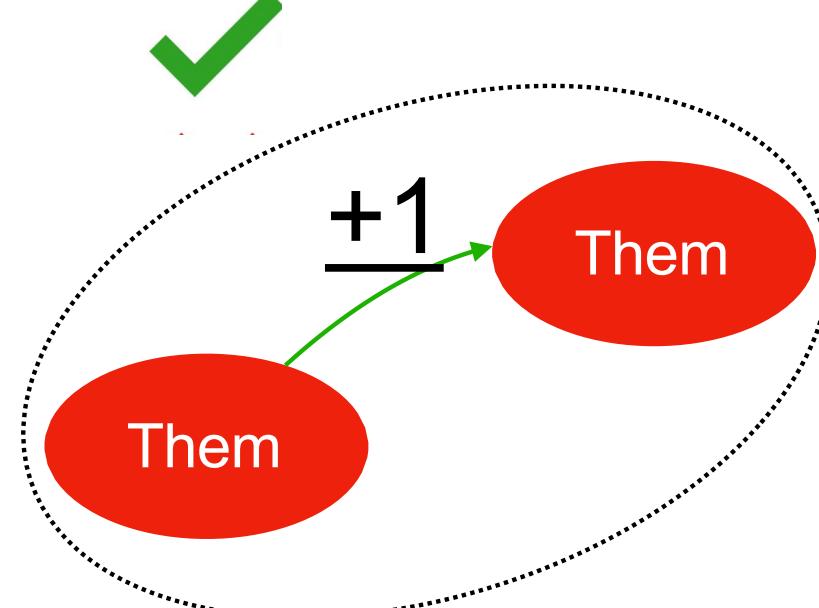
# Populist Sentence Level Motifs

Victimization



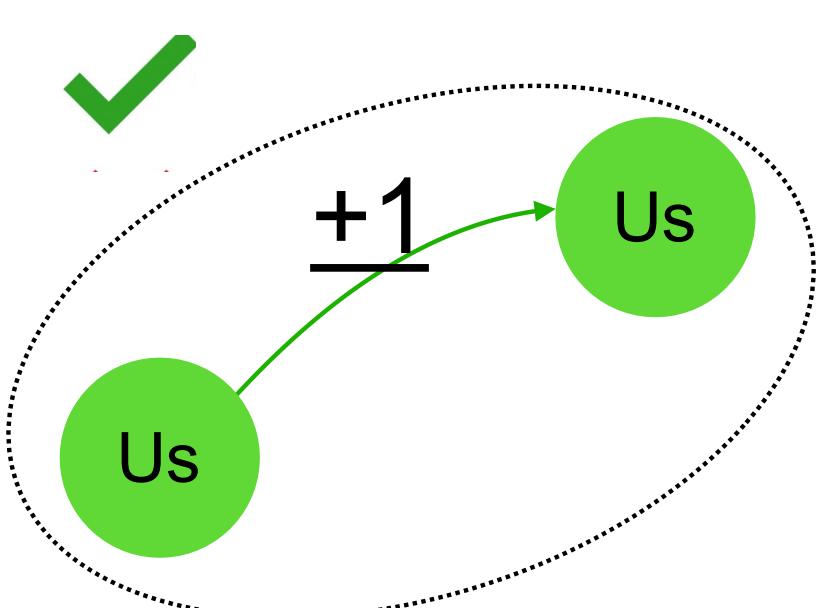
They hurt us

Elite Conspiracy



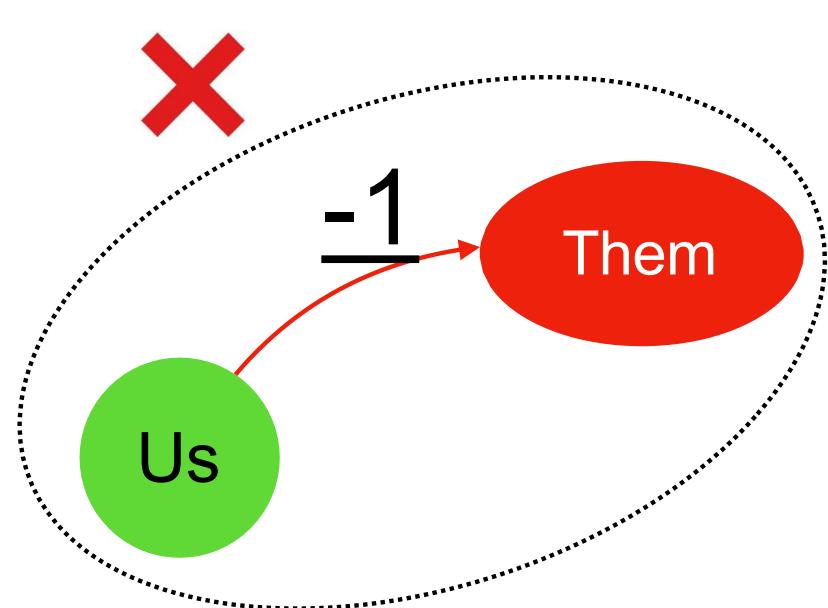
They help themselves

Empowerment



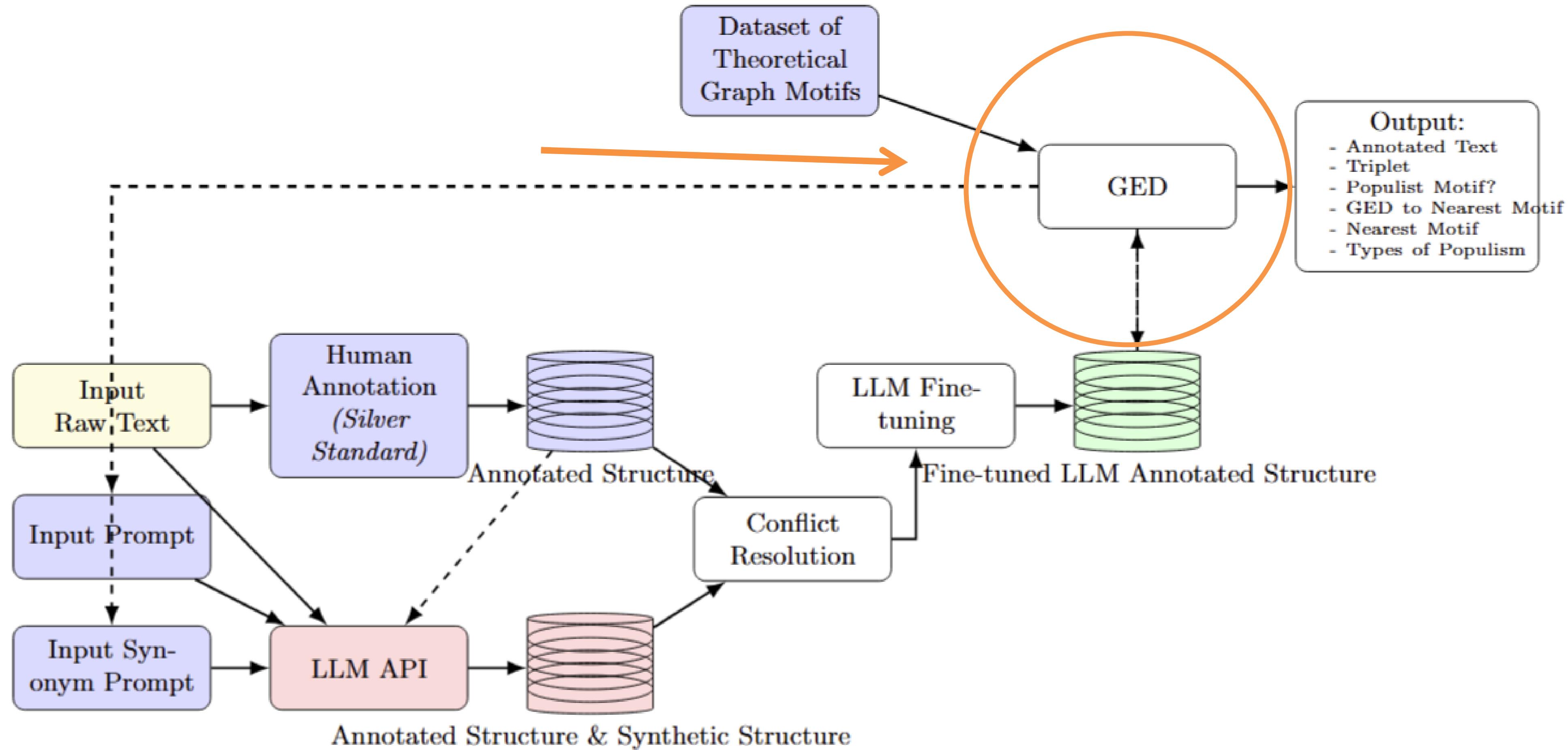
We help you/us

Resistance



We hurt them

# The Computational Steps from Unannotated Texts to Extracting Narrative Structure

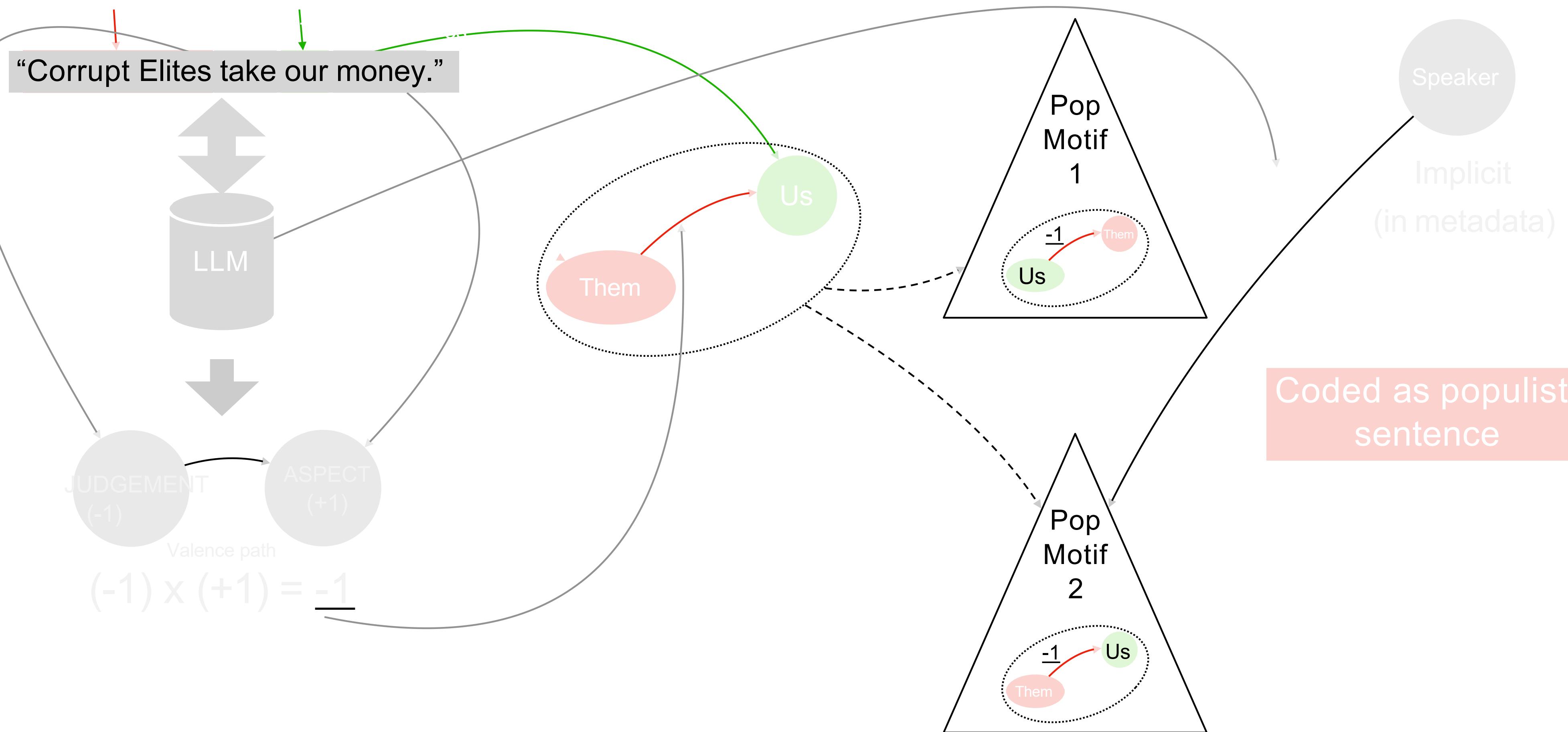


Annotate text

Structure Graph  
Motif

GED: Search for motif  
match in subgraphs

Final Data



## Annotate text

## Structure Graph Motif

## GED: Search for motif match in subgraphs

## Final Data

ACTOR: Them  
TARGET: US  
"Corrupt Elites take our money."



JUDGEMENT  
(-1)

ASPECT  
(+1)

$$\text{Valence path} \\ (-1) \times (+1) = -1$$

Them

Us

Pop Motif 1

Us

Pop Motif 2

Them

Speaker

Implicit  
(in metadata)

Coded as populist sentence

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ASPECT  
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Valence path

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Them

Us

-1

Pop Motif 1

Us

-1

Match

Pop Motif 2

Us

-1

Speaker

Implicit  
(in metadata)

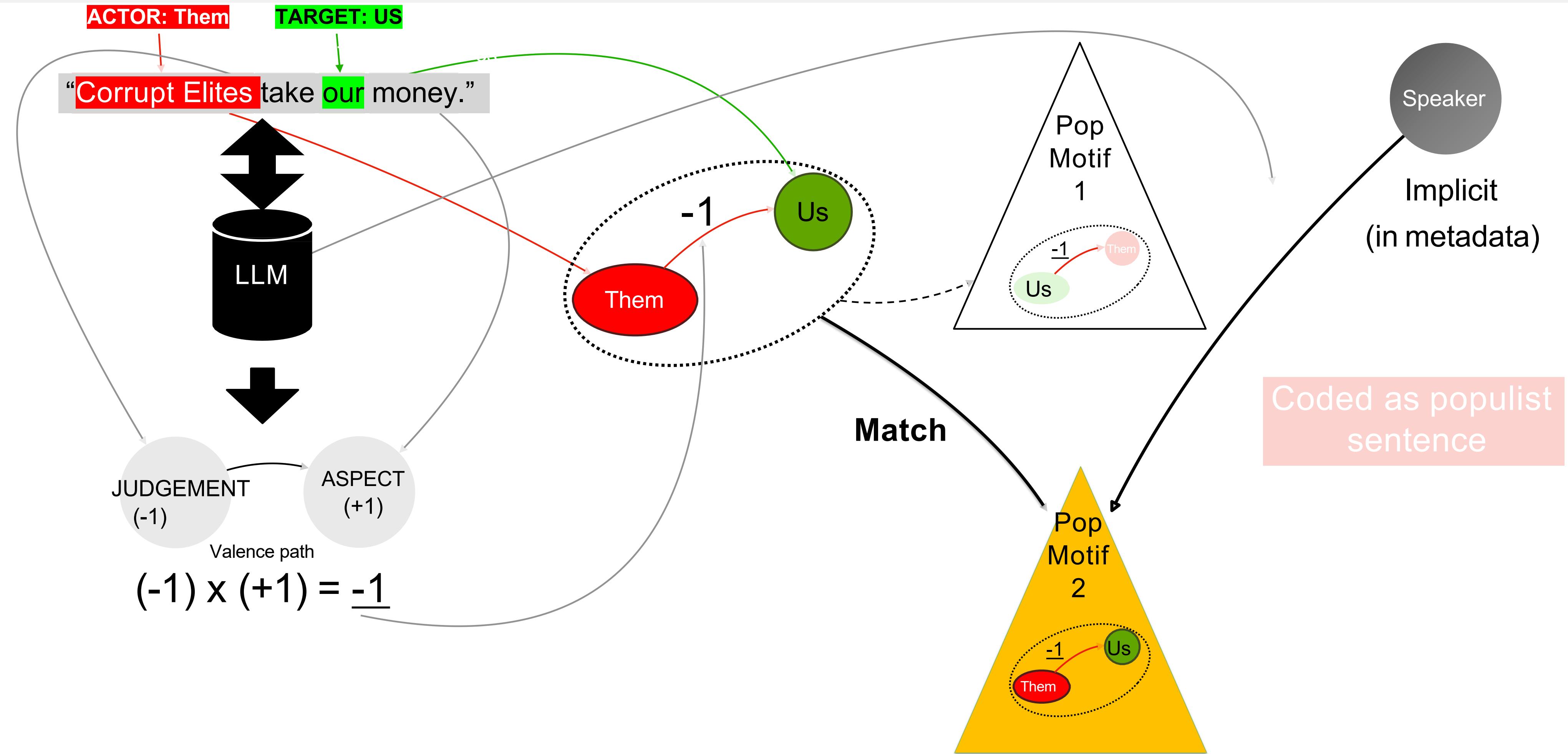
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Match

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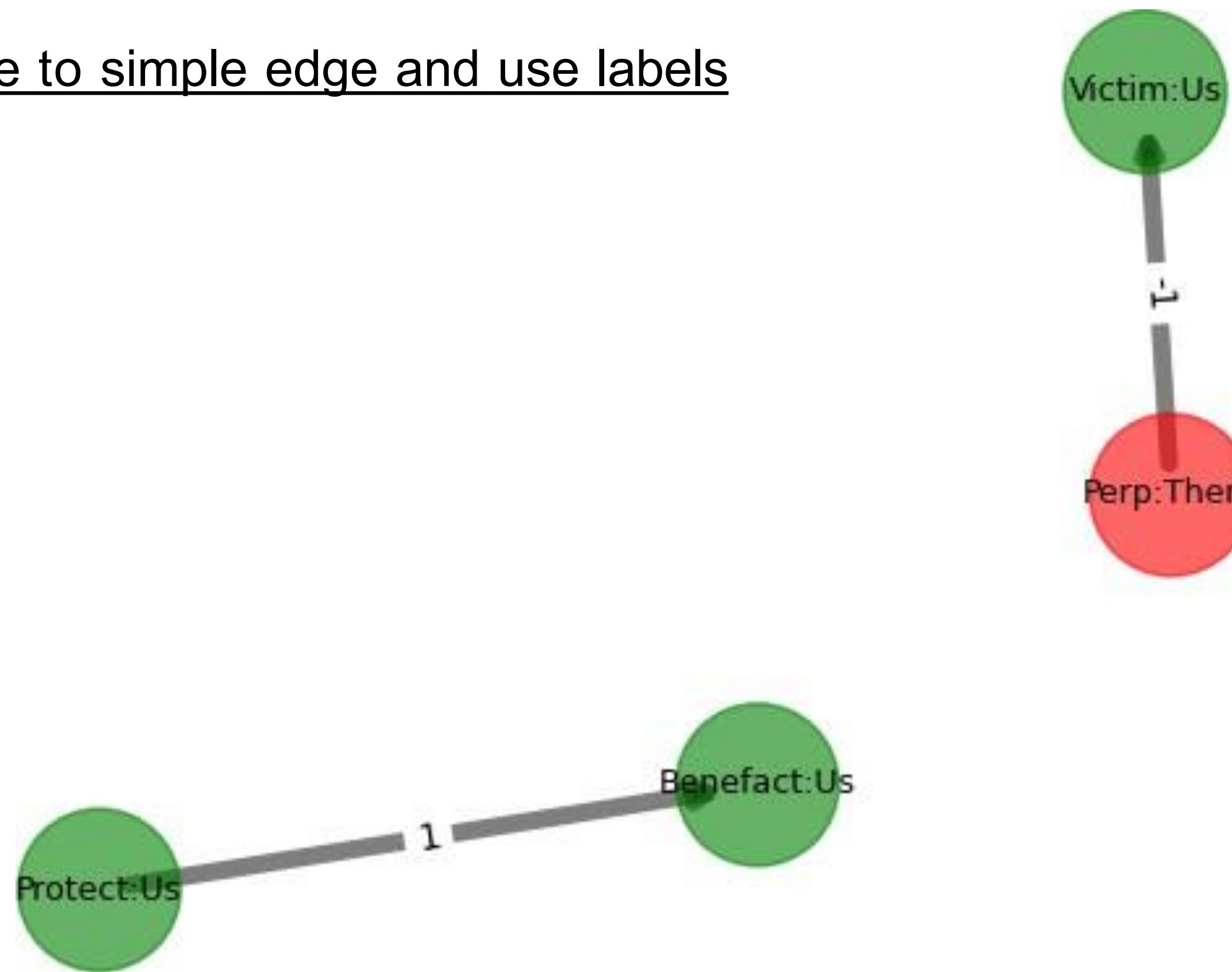
Coded as populist sentence

**“We are engaged in a righteous crusade to liberate this nation from a corrupt political class that is waging war on American democracy”**

**"We are engaged in a righteous crusade to liberate this nation from a corrupt political class that is waging war on American democracy"**

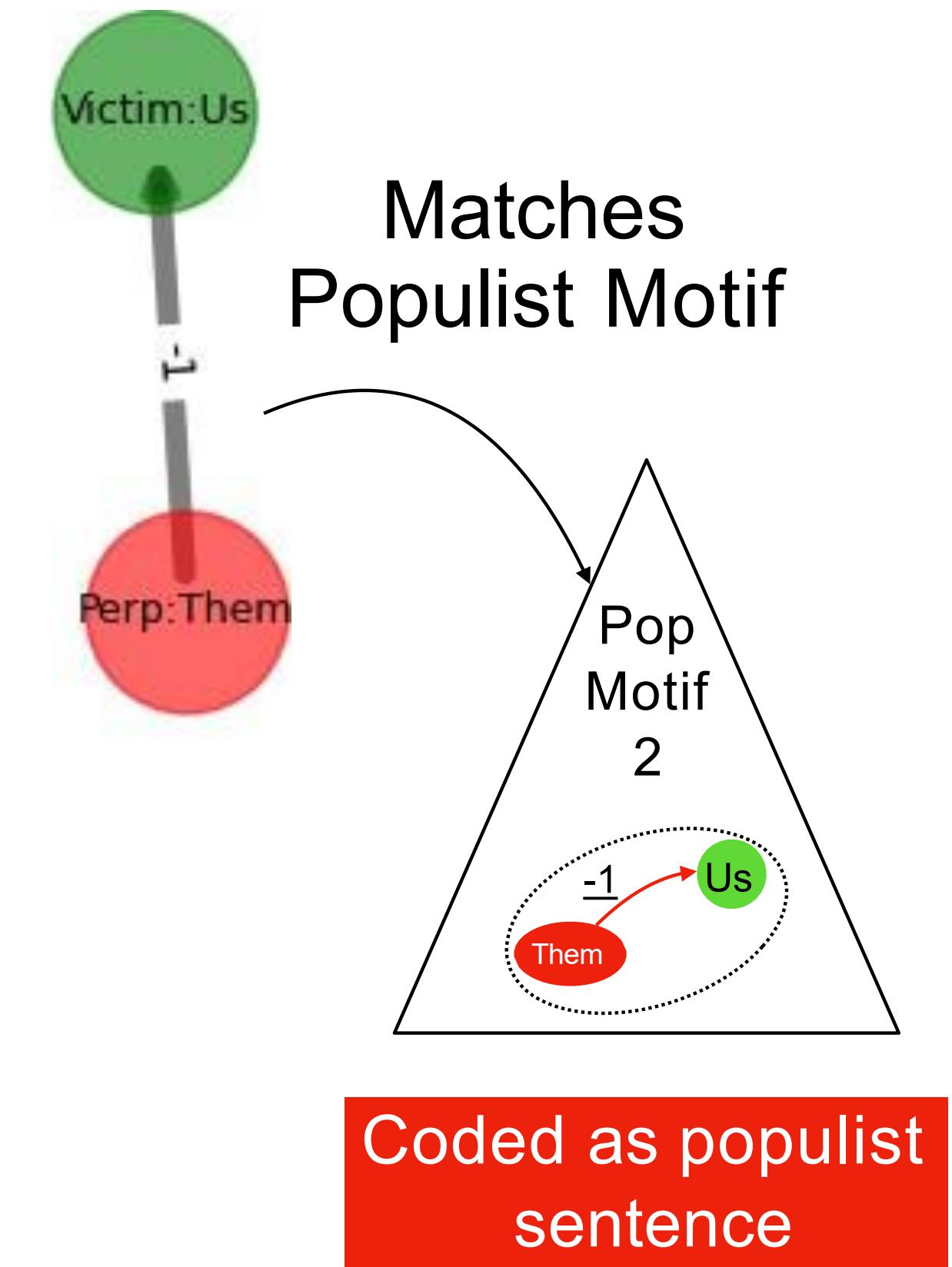
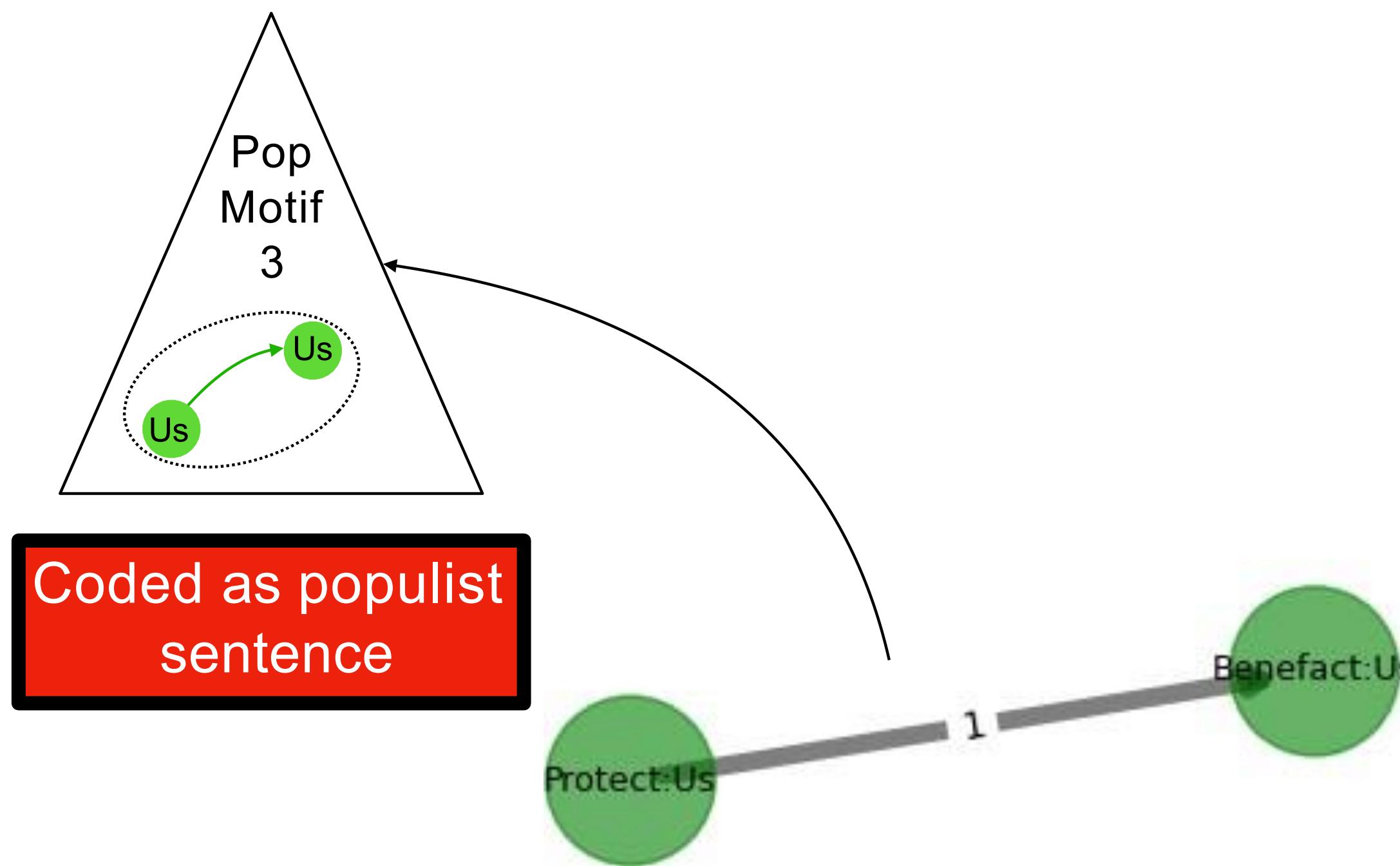
“We are engaged in a righteous crusade to liberate this nation from a corrupt political class that is waging war on American democracy”

Reduce path/hyper-edge to simple edge and use labels



"We are engaged in a righteous crusade to liberate this nation from a corrupt political class that is waging war on American democracy"

Check for Matches among populist motifs



# Our Approach in Action

# Strategic Usage of Populism: Trump's 2016 Campaign

- **Data:** 89 **Trump rally speeches** from 2016 General Election
  - Replication data **Gonzalez-Rostani (2025)**: Presidential Project & YouTube

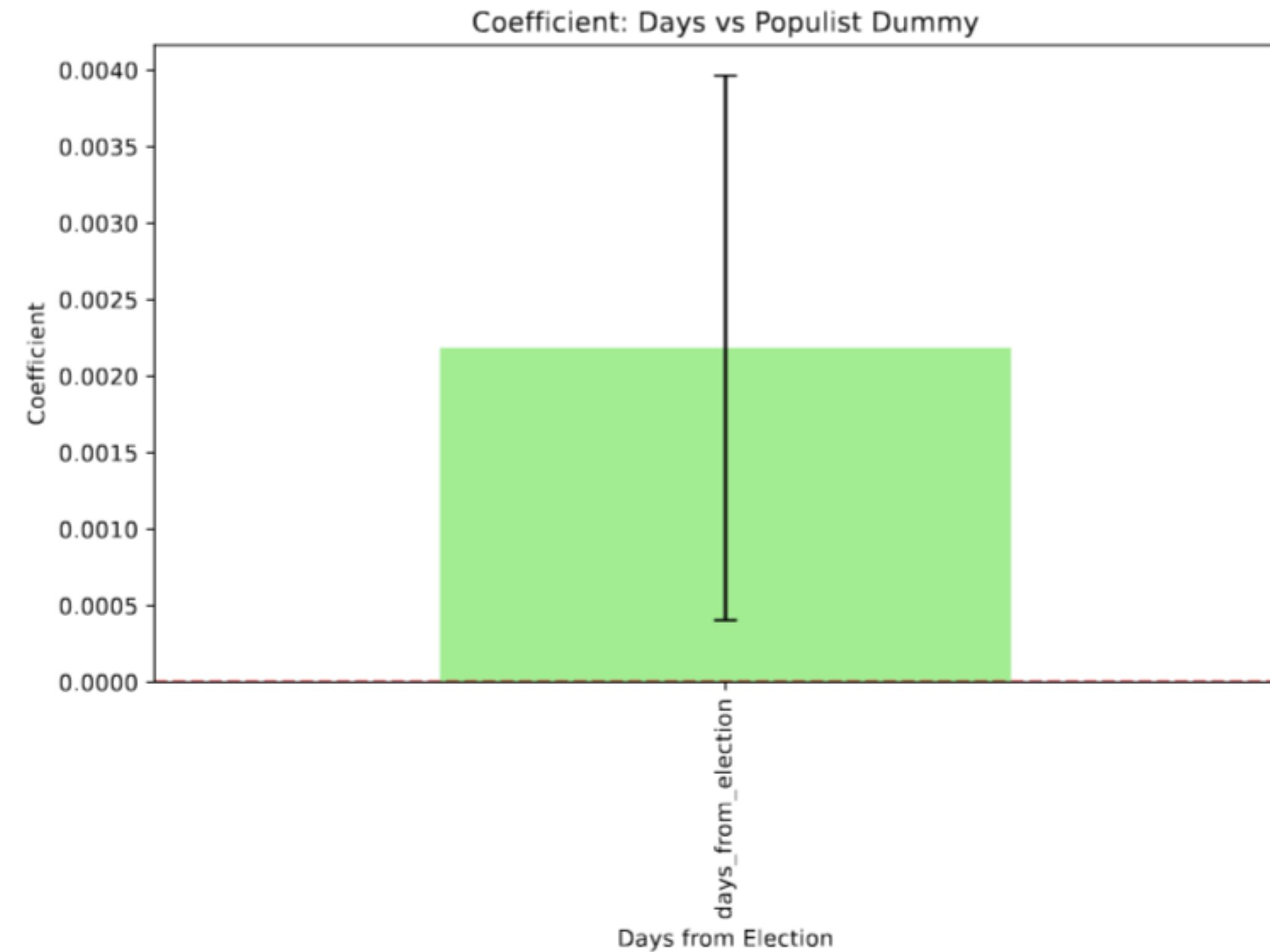
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# Strategic Usage of Populism: Trump's 2016 Campaign

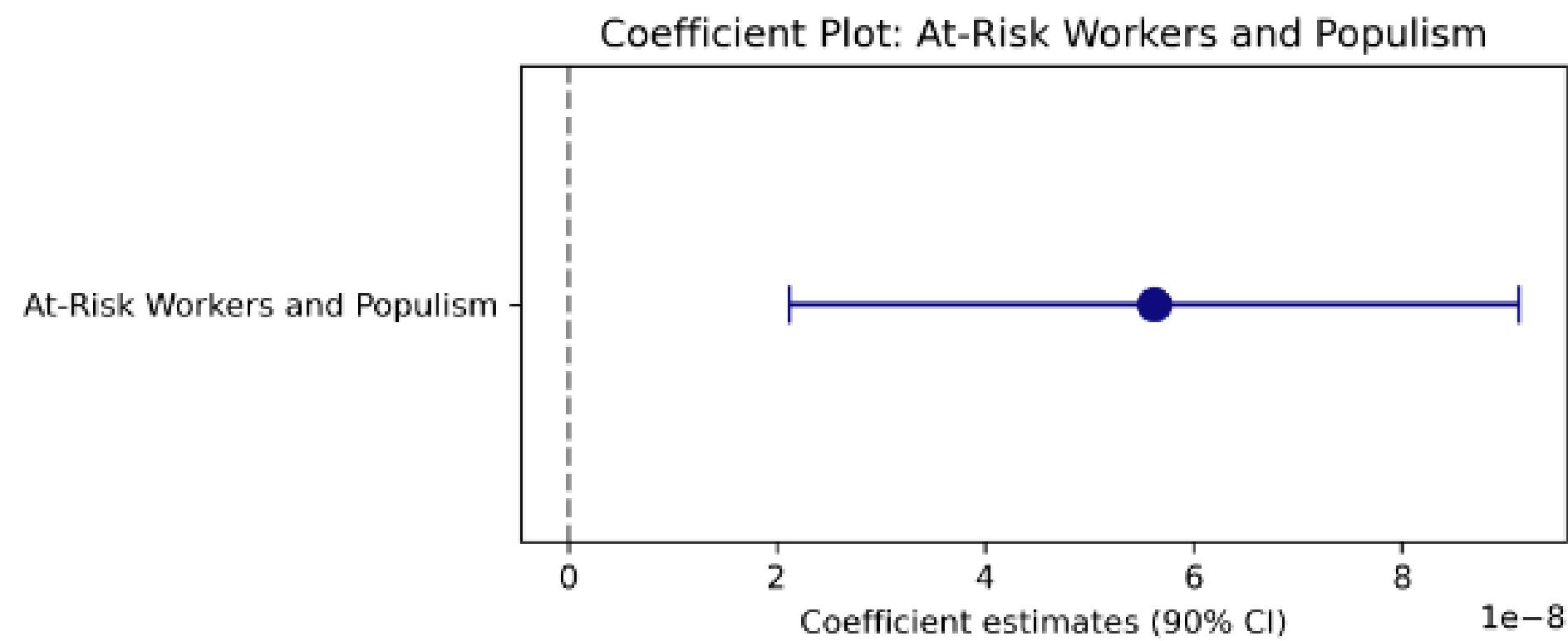
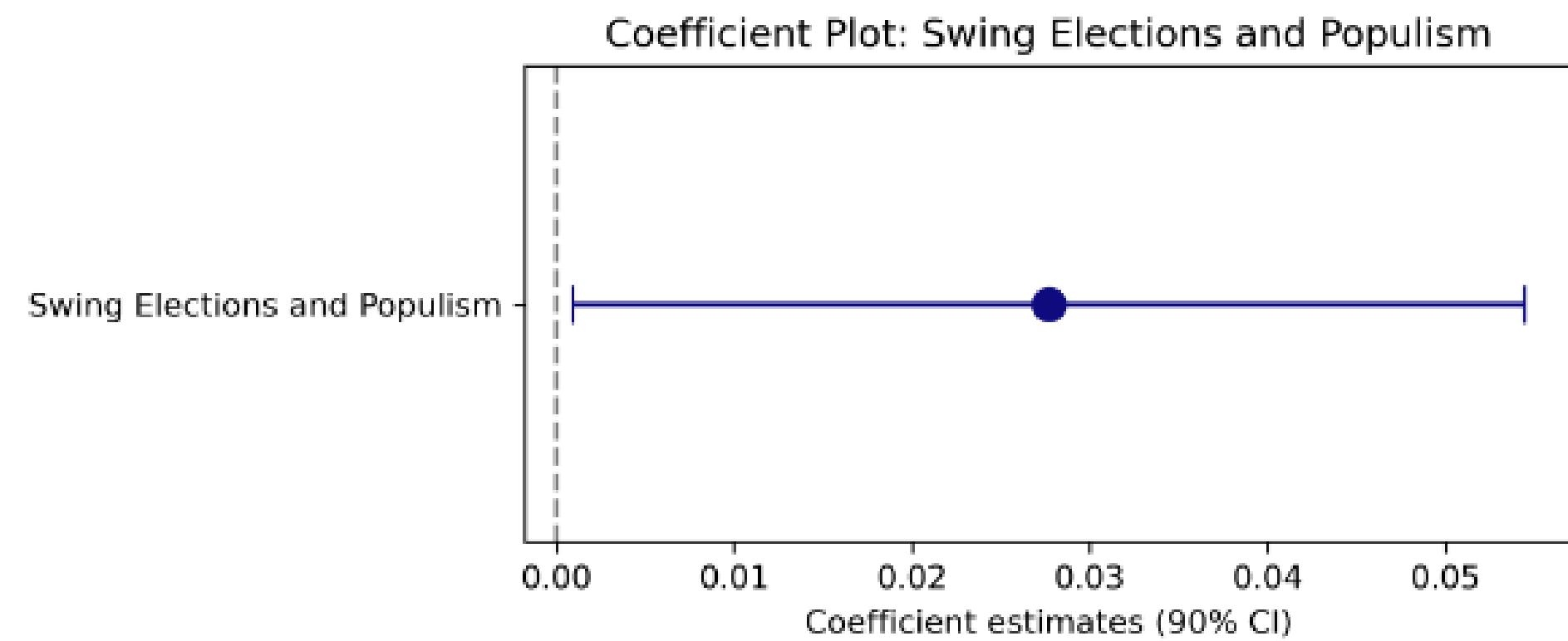
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  - Replication data **Gonzalez-Rostani (2025)**: Presidential Project & YouTube
- **Method:** AI-based annotation with populist motif detection ( $GED=0$ )
- **Validation:** Confirmed by dictionary-based populism measures
- **New questions can be answered**
  - Temporal Dynamics
  - Geographic Focus: Competitive Elections & Target Vulnerable Workers

# Strategic Usage of Populism: Trump's 2016 Campaign



Temporal Dynamics: Increased populist rhetoric closer to election day

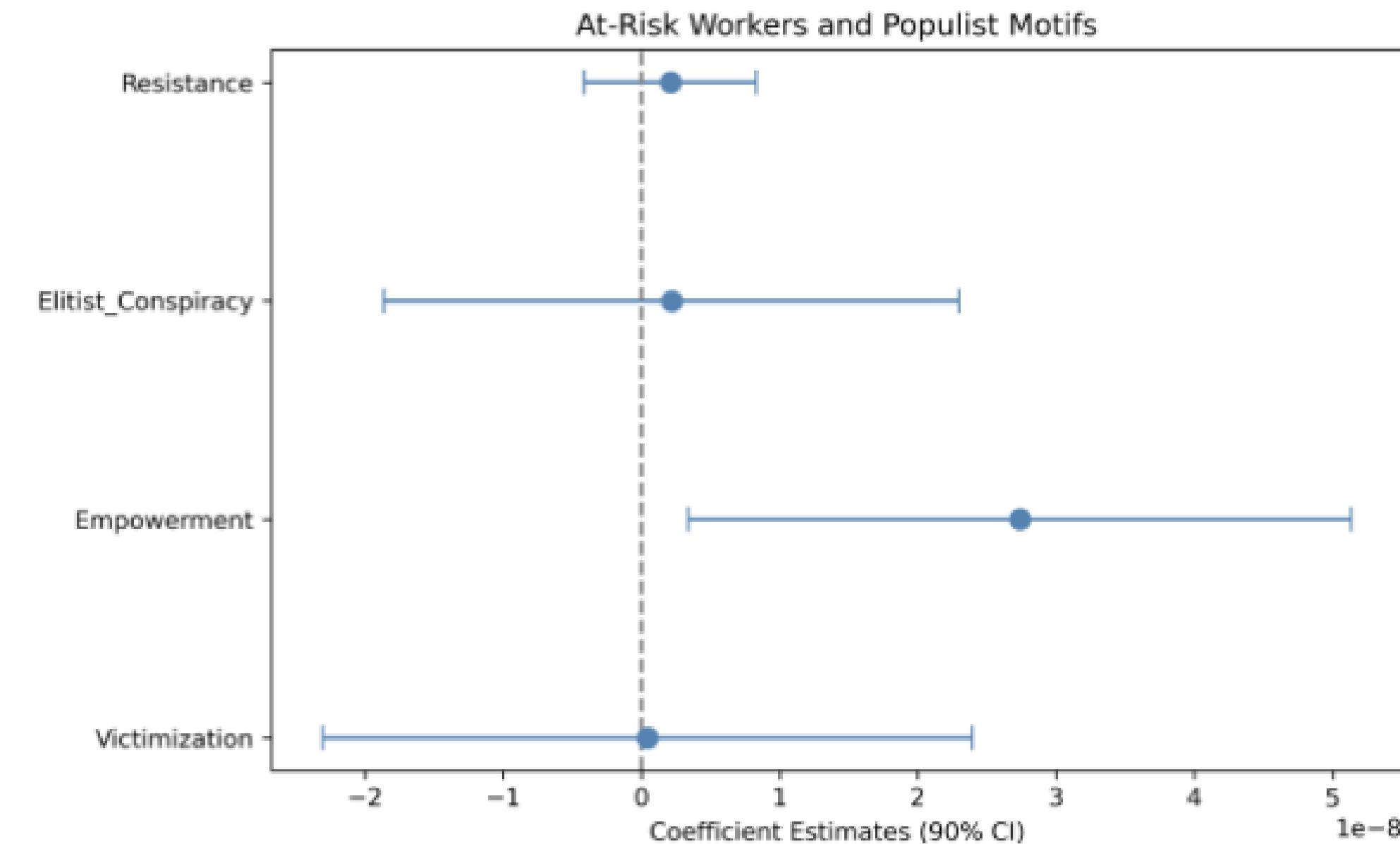
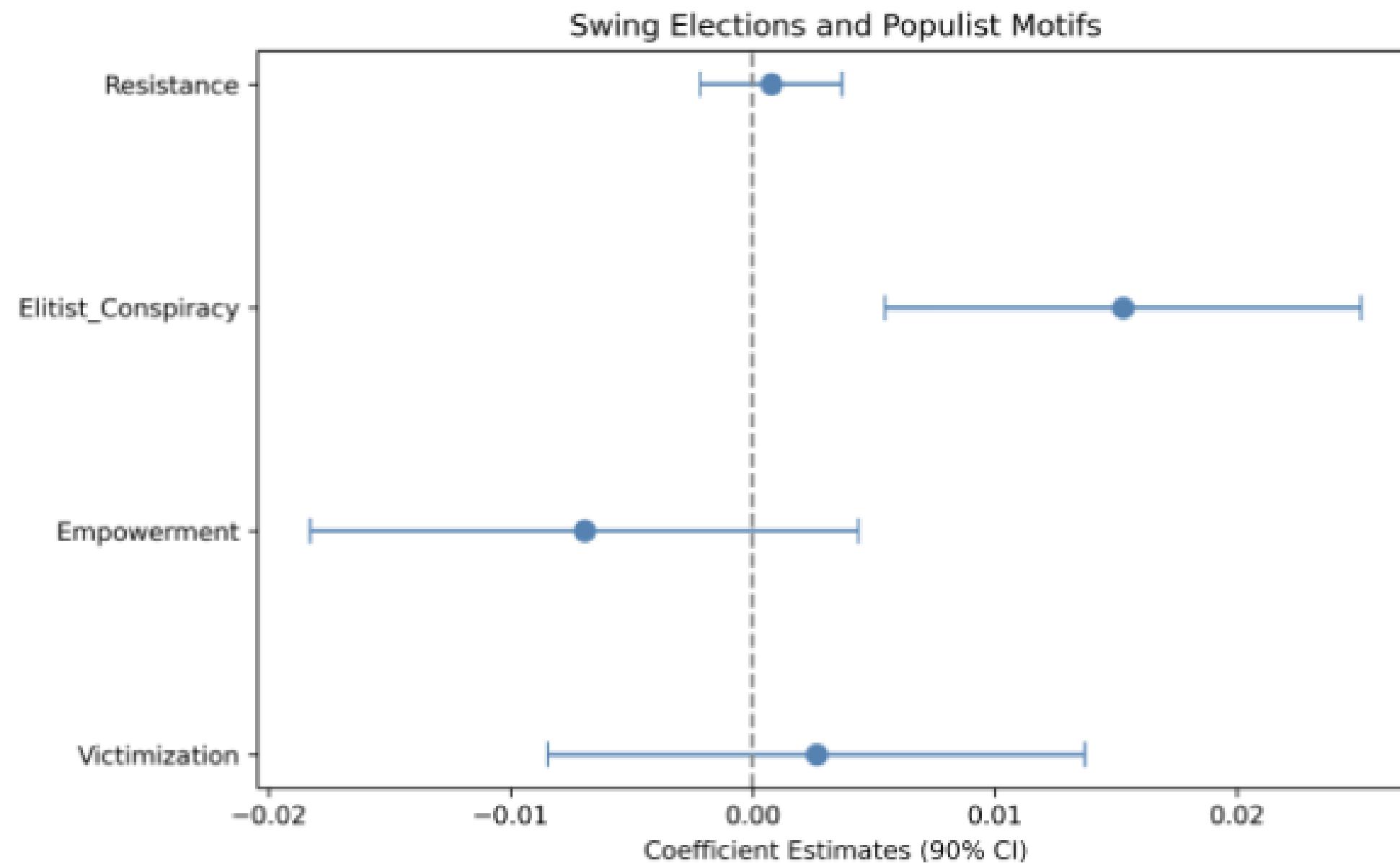
# Strategic Usage of Populism: Trump's 2016 Campaign



**Geographic Focus:**  
Greater **populist** usage in **swing** states

**Economic Context:**  
Greater **populist** usage in **automation** vulnerable regions

# Strategic Usage of Populism: Trump's 2016 Campaign Which Type?



**Geographic Focus:**  
Greater use of **Elite Conspiracy** frame in  
swing states

**Economic Context:**  
Greater use of **Empowerment** frame in  
automation vulnerable regions

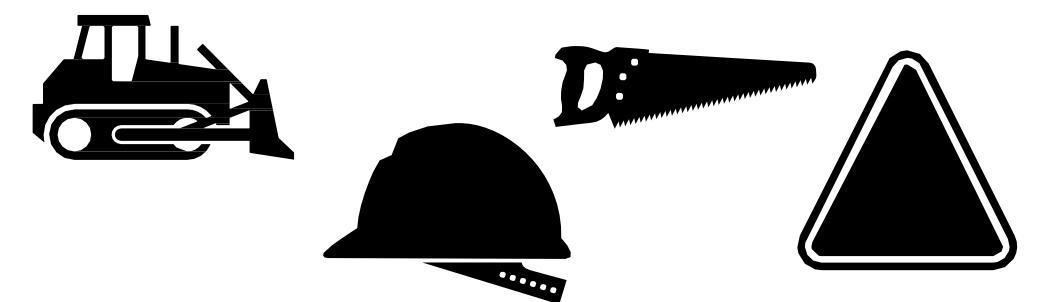
# Final Remarks

- Our **Fine-Grained approach allows to answers new questions:**  
Selective use, timing, and context-dependence of populist rhetoric

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Much more work to do...

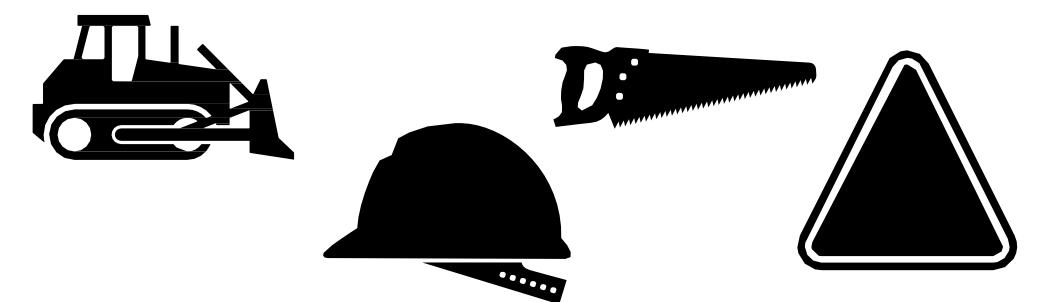


- Improve supervised learning and labeling of tokens with attributes
- Extend motif extraction across sentences and paragraphs: co-reference resolution
- Validate and adapt framework for comparative international research

# Final Remarks

- Our Fine-Grained approach allows to answers new questions:  
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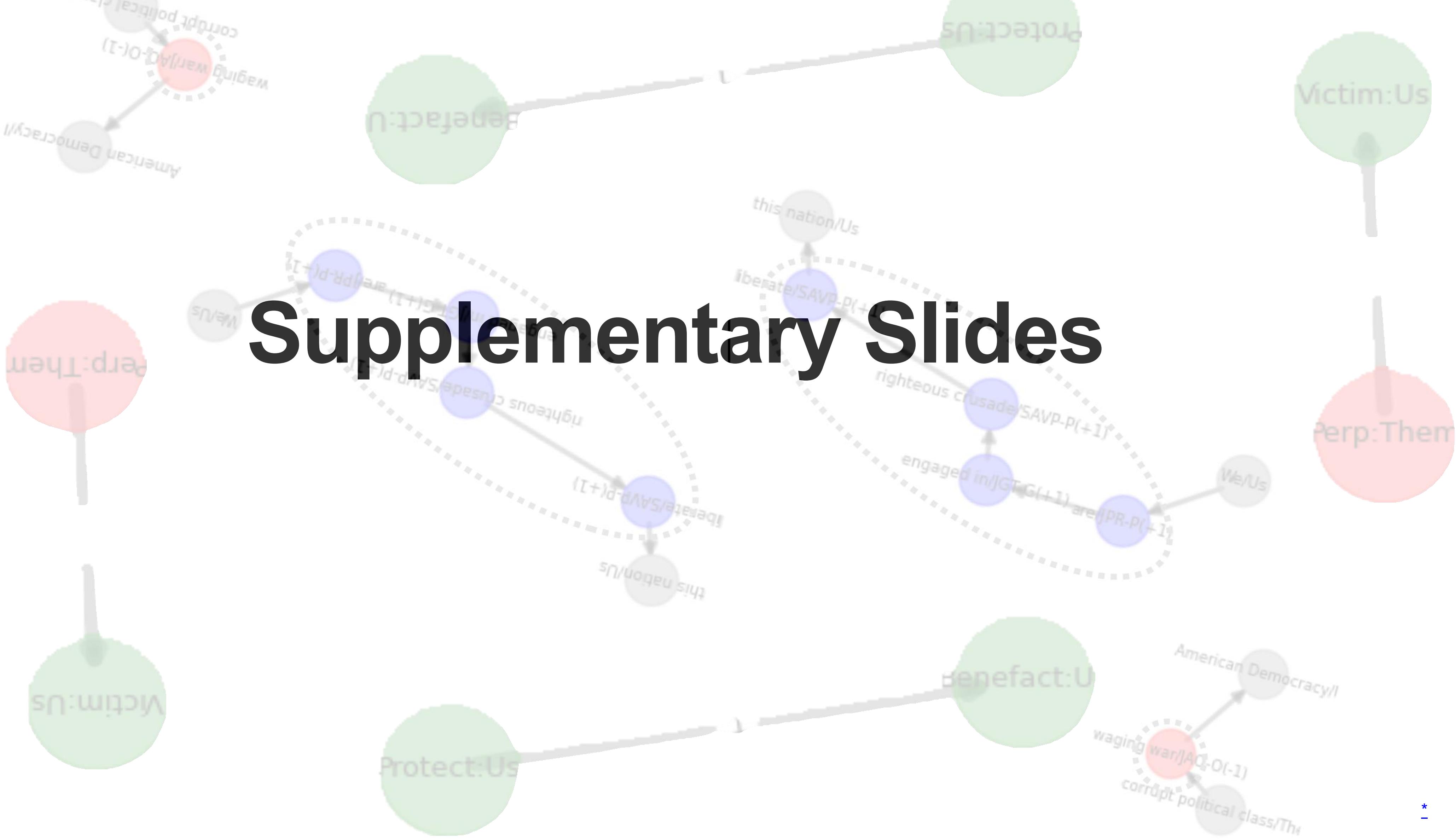


- Improve supervised learning and labeling of tokens with attributes
- Extend motif extraction across sentences and paragraphs: co-reference resolution
- Validate and adapt framework for comparative international research

Thank you!

[gonzalezrostani@princeton.edu](mailto:gonzalezrostani@princeton.edu) | gonzalez-rostani.com

# Supplementary Slides



# Supplementary Slides

- [Existing Measures](#)
- [Ontology](#)
- [Scale up- token level model](#)
- Examples: [1](#), [2](#), [3](#), [4](#)
- Example [Motifs with Graph](#)
- Complex cases: [Nested](#), [Non-Speaker](#)
- LLM: [Token-level validation](#) and [metrics](#), [Synthetic data](#)
- [GED definition](#)
- Identifying [groups](#)
- Our Approach in action: [Share](#), [Paragraph Trump](#), [Paragraph Obama](#),  
[Populist using non-pop.](#)

Back: [Title](#), [Thin-Centered](#), [Aggregation Problem](#), [Contribution](#), [Our Approach](#), [Components](#), [Structure](#), [Motif](#), [Motif Example](#), [Example 1](#), [GED](#), [GED example](#), [Scale up](#), [Steps](#), [Human annotations](#), [LLM](#), [Fine-tuning](#), [Motif visualization](#), [Full example](#), [Application](#), [temporal dynamics](#), [geographic dynamics 1](#), [geographic dynamics 2](#), [Final Remarks](#)

# Previous Works

# Overview of Measurement Strategies

## Expert Surveys:

- Chapel Hill Expert Survey (2017)
- POPPA Survey (2018)
- Global Party Survey (GPS)

## Textual Data Analysis:

- Dictionary-based methods (Jagers, Hawkins, Casiraghi, etc.)

## Limitations of Existing Approaches

### Coarse Granularity:

- Binary labels for parties or large text segments
- Fails to capture nuanced, "thin-centered" definitions (Mudde, 2007)
- Ignores rhetorical variation within parties, speeches, and individuals
- Cannot identify shifts in rhetoric across contexts or topics

## Nuance in Populist Discourse

- Current methods miss interactions between populism and other discourses (nationalism, anti-globalism, technoskepticism)
- Difficulty distinguishing left vs. right populism

# Human Costs and Adaptability Tradeoffs

Manual annotation methods:

- High resource costs, extensive training
- Difficult to scale

Dictionary-based methods:

- Efficient but context-specific
- Require extensive adaptation across languages and political contexts
- Risk of misinterpretation when decontextualized (Schaffer, 2000)

# The Populist-PULSAR Ontology

- **Foundation:** Extends PULSAR framework (Park et al., 2018)
- **Structure of Annotations:**
  - **Labels** encode populist narrative components and their connections
  - Applied to **sentence-level tokens**, preserving context and positional information
- **Data Representations:**
  - **Graph-based** (nodes: Actors, Targets, Judgments; edges: dependencies)
- **Advantage over Dictionary-based Approaches:**
  - Context-aware labeling
  - Precise location tracking within text

# Fine-tuning Our Models - PyTorch

Label	Attribute	Precision	Recall	F1	Accuracy
Actor	Them	0.46	0.46	0.46	0.9345
	Residual	0.20	0.27	0.23	
	Us	0.67	0.72	0.70	
Target	Them	0.27	0.33	0.30	0.9035
	Residual	0.00	0.00	0.00	
	Us	0.33	0.30	0.31	
Judgment					0.8595
	NEG (-1)	0.05	0.04	0.05	
	POS (+1)	0.15	0.18	0.16	
Aspect					0.6901
	NEG (-1)	0.08	0.11	0.10	
	POS (+1)	0.13	0.16	0.14	

## Token-Level Approach

- Separate BERT models for BIO tagging
- Identifies precise token spans
- Fine-tuned individually per component

# Synthetic Sentences

---

## Synthetic Variants of Political Speech Sentence

---

1. Every real American is entitled to liberty.
  2. Each true American is entitled to liberty.
  3. All genuine Americans are entitled to liberty.
  4. Every authentic American has the right to liberty.
  5. Each legitimate American deserves liberty.
  6. All real patriots have a right to liberty.
- 

Table A.2: Synthetic variants preserving the meaning of a sentence while introducing syntactic and lexical diversity.

Note: Original sentence was “*Every real American deserves freedom.*”

# **Definition of GED:**

- GED measures differences between two narrative structures (graphs), expressed as a numerical distance.
- Formally:  $\text{GED}(G_i, G_j) \rightarrow d_{ij}$ , with  $d_{ij}$  as a positive real number.

# **Distance Calculation Rules:**

- Maximum single-edit distance is 4 (changing valence from positive to negative or vice versa).
- Changing "US" to "THEM" in either the Actor or Target role has a distance of 2 per edit.
- Distances from multiple edits are additive (e.g., changing Actor-US to Actor-THEM and Target-THEM to Target-US totals a distance of 4).
- The smallest non-zero distance is 1, applicable when changing from specified roles (US or THEM) to residual (unspecified) roles.

# **Analogy:**

- Similar to Manhattan distance, calculating distances independently for each dimension

# Conceptual Explanation of GED Penalization System

Penalty Value	Explanation
0	No change: Actor, valence, and target match exactly.
1	Minor ambiguity: Explicit actor replaced by ambiguous actor (Residual).
2	Actor/Target substitution: Switching between US and THEM roles.
4	Valence reversal: Changing polarity from positive to negative or vice versa.

# Evaluating LLM Performance Token Annotation

## Objective:

Measure if iterative improvements in prompts enhanced model accuracy.

## Method:

- GED-based metric.
- Compared LLM-generated annotations to human annotations (our silver standard).
- More robust evaluation than token-level accuracy.
- Follows recommended practices for tailored benchmarks in prompt engineering research (Schulhoff, 2025).

## Acceptance Criteria (GED Scores):

- Acceptable if **GED = 0 or 1** (minor differences).
- Also acceptable if GED = 2 or 3, provided misclassifications involve minor roles only (e.g., labeling "**Residual**" instead of "US"/"THEM"), without polarity reversals.

# LLM Performance

## Overall Performance:

- **76.2%** of classifications were acceptable.

## Detailed Breakdown:

- **27.4%** Exact matches (GED = 0):  
Perfect alignment with human annotations.
- **40.5%** Minimal differences (GED = 1):  
Minor misclassification between known groups and "Residual."

## Implications:

- Most discrepancies minor, preserving key structural elements.
- Highlights effectiveness of refining prompts to improve LLM annotation quality.

# **Examples 1**

**“Joe Biden wants to inflict a painful shutdown on our entire country”**

“Joe Biden wants to inflict a painful shutdown on our entire country”

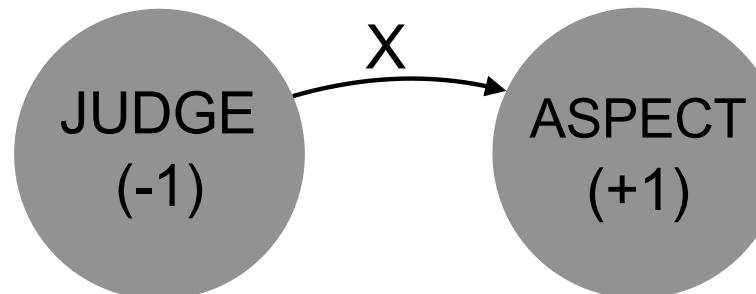


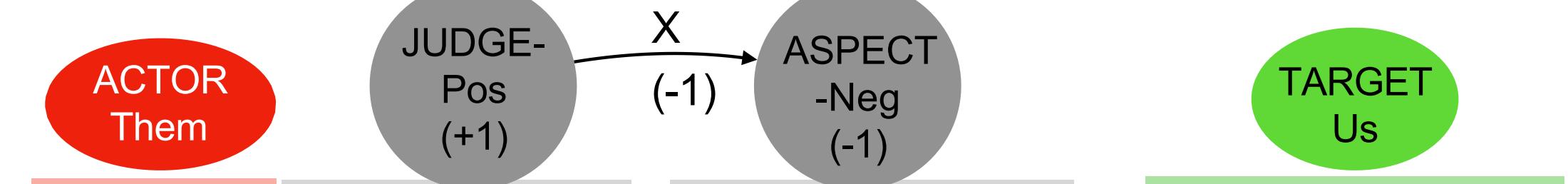
Is an “Us” or “Them” mentioned in the ACTOR or TARGET?

What aspect is mentioned and is it positive or negative (or neutral)?

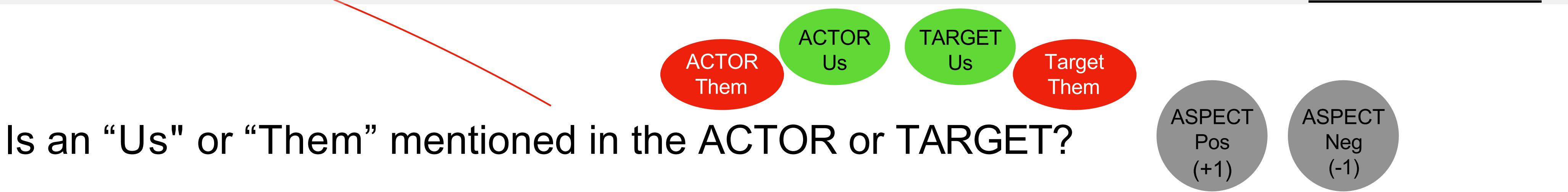
What judgment is communicated about whether the aspect is added, subtracted or neutral?

What is the calculated valence?





“Joe Biden wants to inflict a painful shutdown on our entire country”

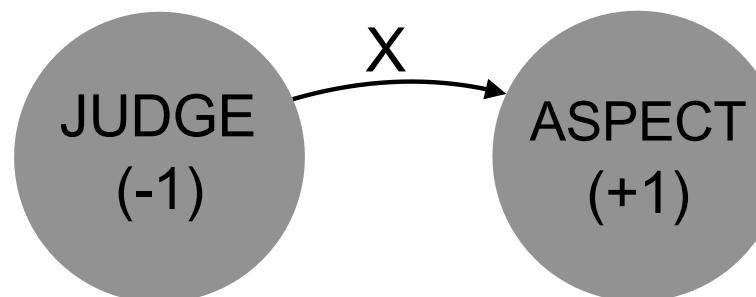


Is an “Us” or “Them” mentioned in the ACTOR or TARGET?

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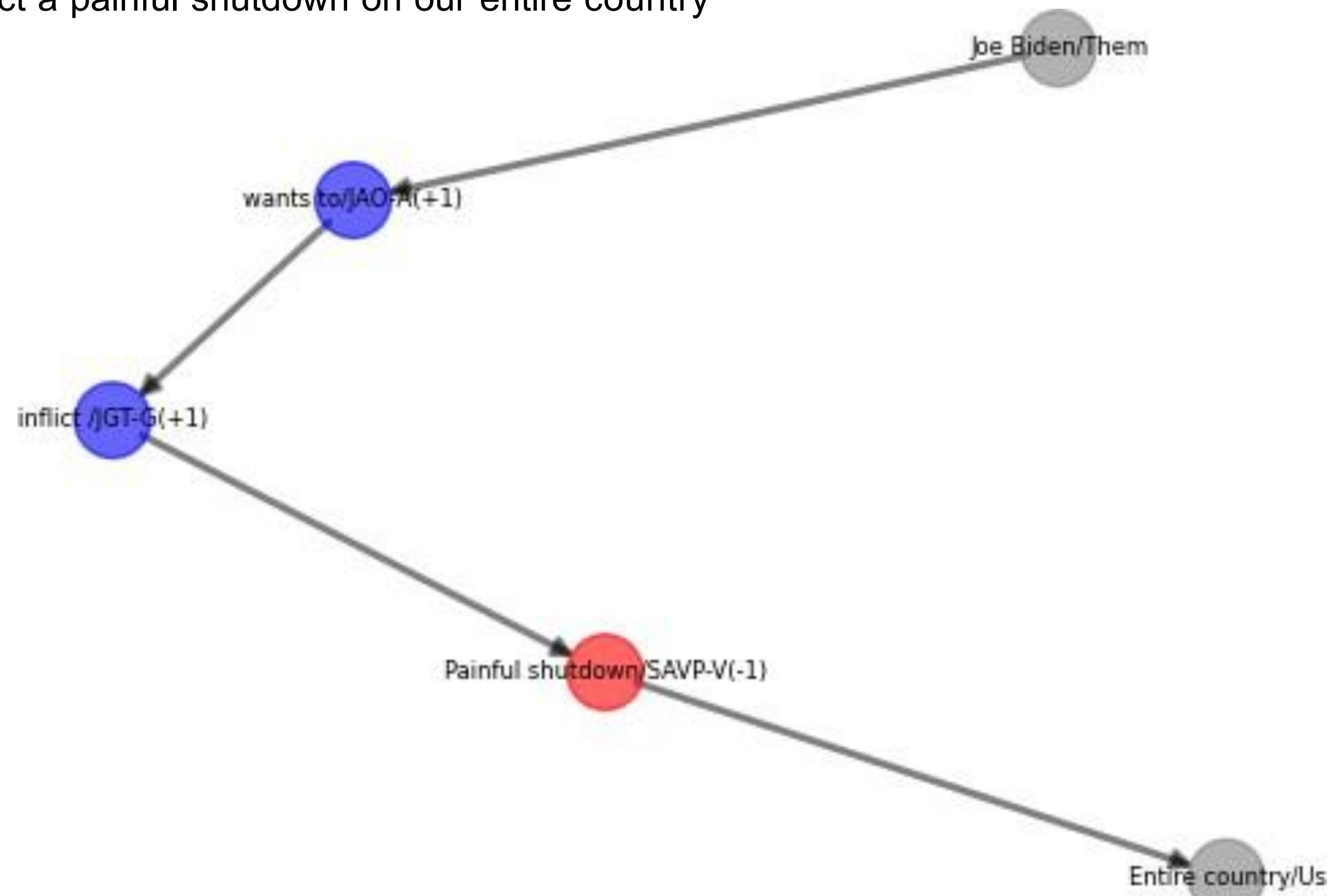
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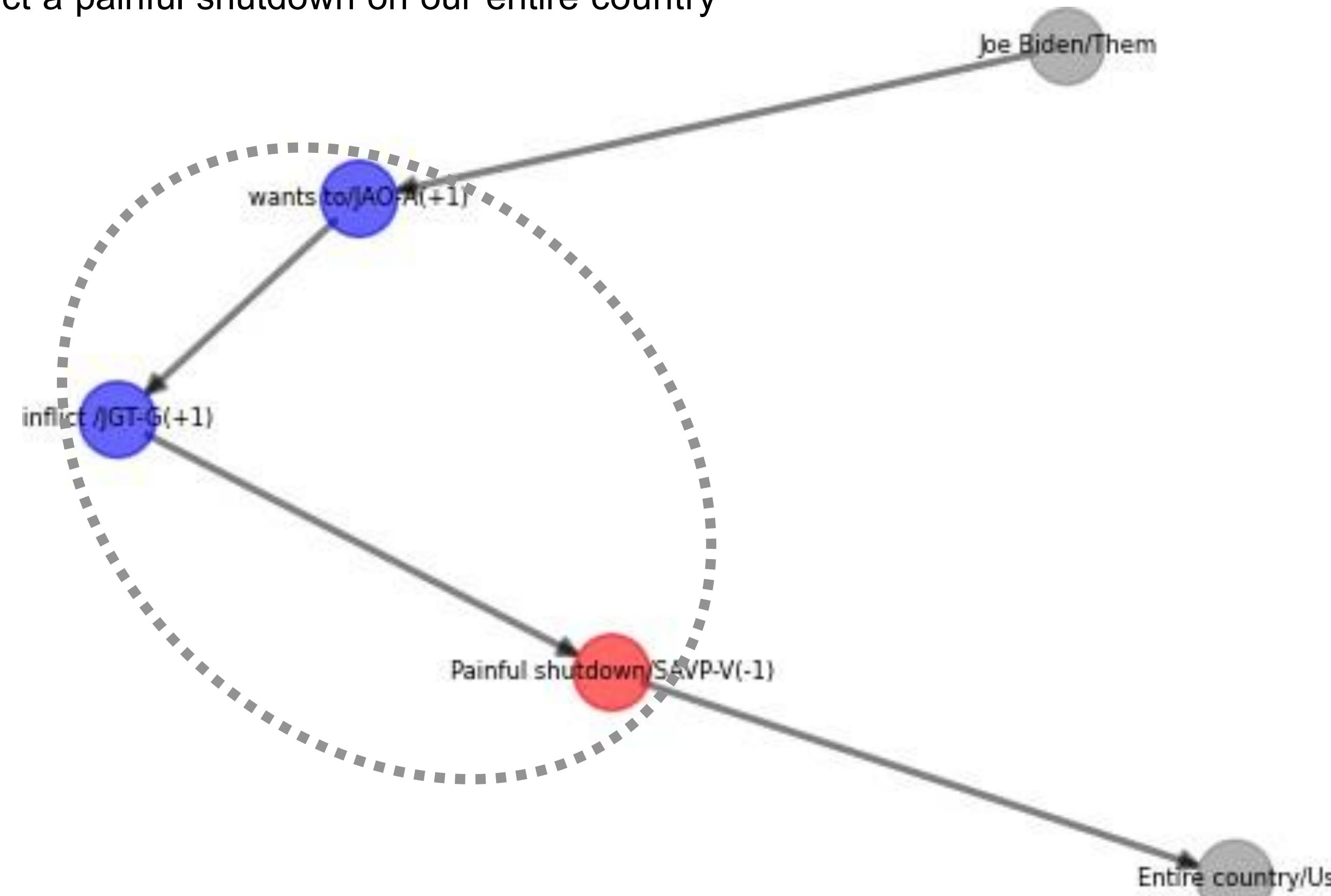
## Full Valence Graph With Labels

“Joe Biden wants to inflict a painful shutdown on our entire country”

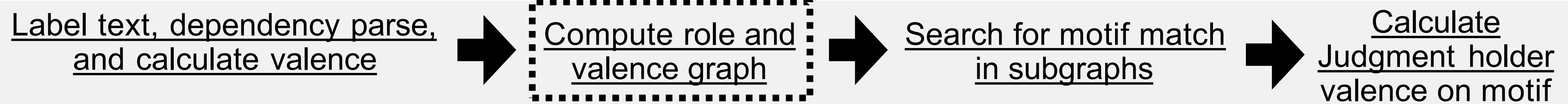


## Follow Valence Path, where path can be thought of as part of a hypergraph

“Joe Biden wants to inflict a painful shutdown on our entire country”

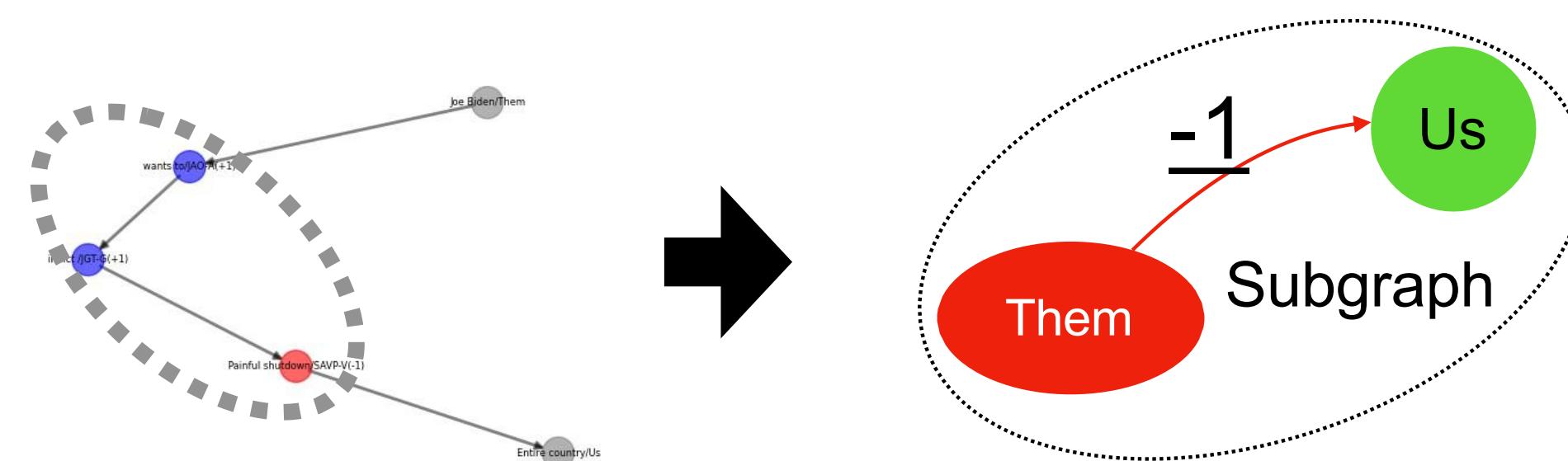


“Joe Biden wants to inflict a painful shutdown on our entire country”



What was the role of the perpetrator/protector (“Us” or “Them” or “Neither”) or victim/beneficiary? (Monism aspect of populism)

Was the valence of the action positive (a good thing) or negative (a bad thing)? (Moralism aspect of populism)

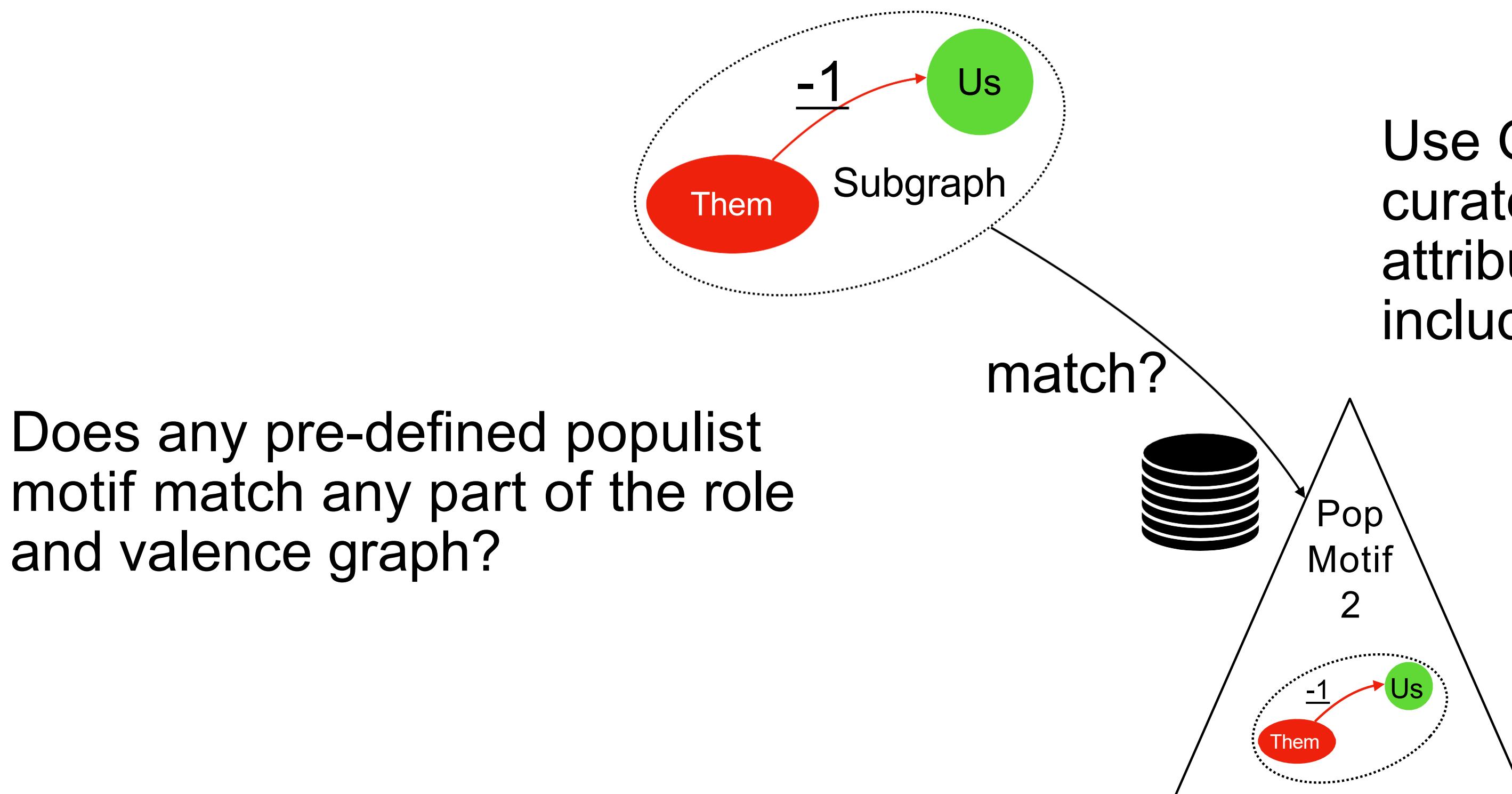


“Joe Biden wants to inflict a painful shutdown on our entire country”

Reduce path/hyper-edge to simple edge and use labels



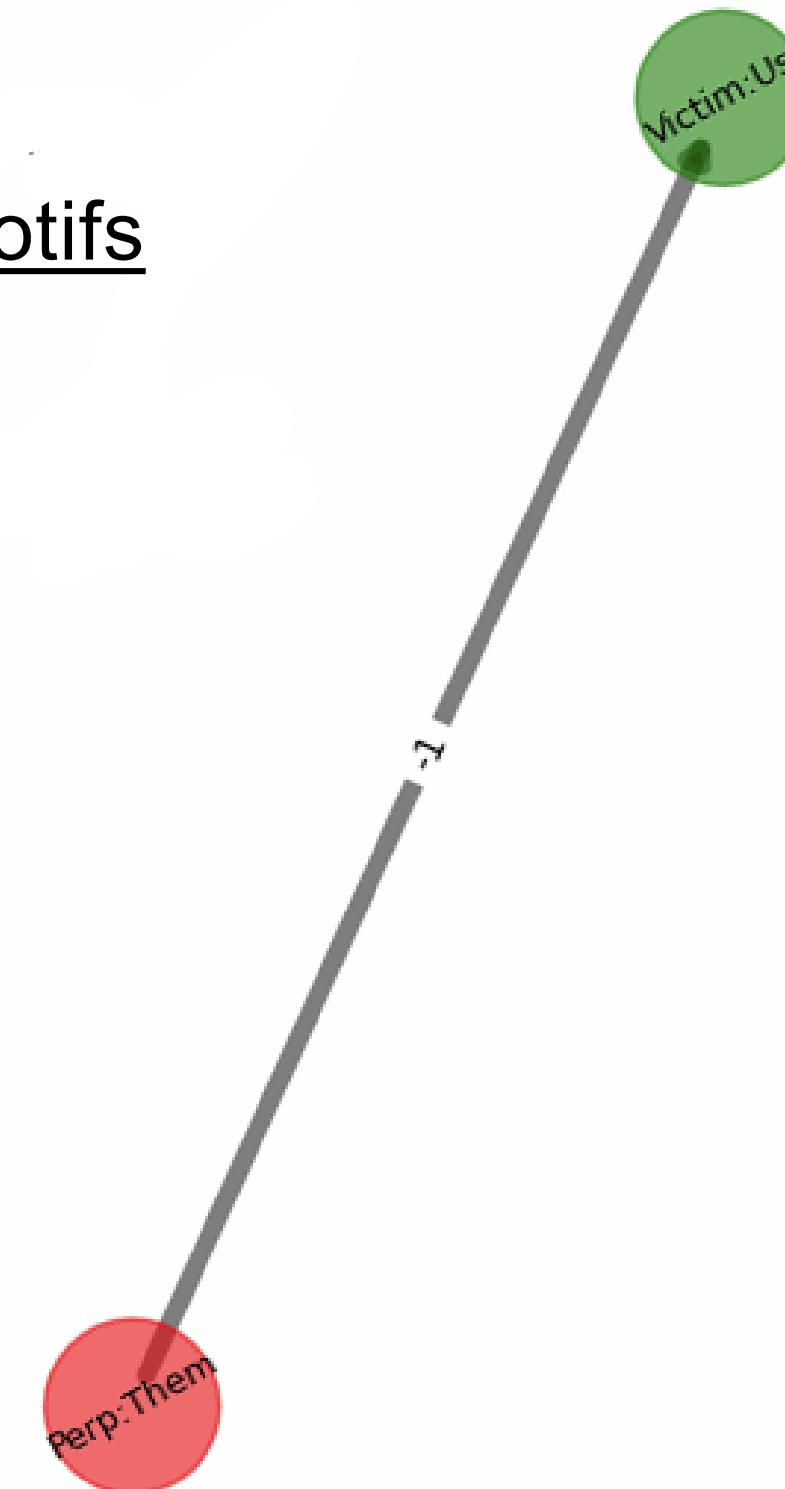
“Joe Biden wants to inflict a painful shutdown on our entire country”



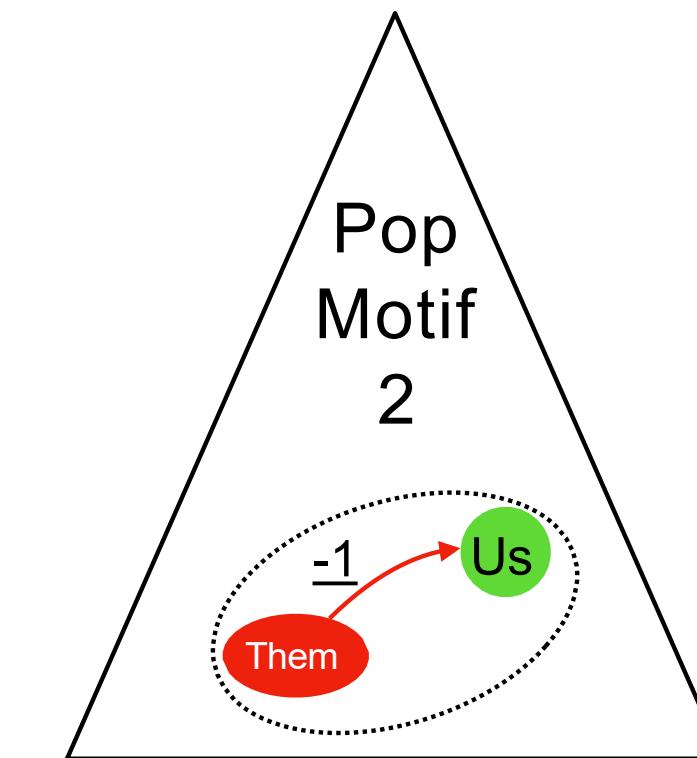
Use Graph Edit Distance with curated distances between attributes of nodes and edges, including missing attributes

“Joe Biden wants to inflict a painful shutdown on our entire country”

Check for Matches among populist motifs



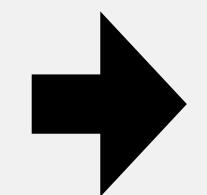
Matches  
Populist Motif



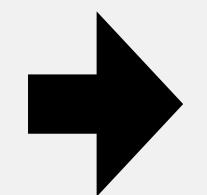
Coded as populist  
sentence

“Joe Biden wants to inflict a painful shutdown on our entire country”

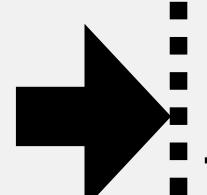
Label text, dependency parse,  
and calculate valence



Compute role and  
valence graph



Search for motif match  
in subgraphs



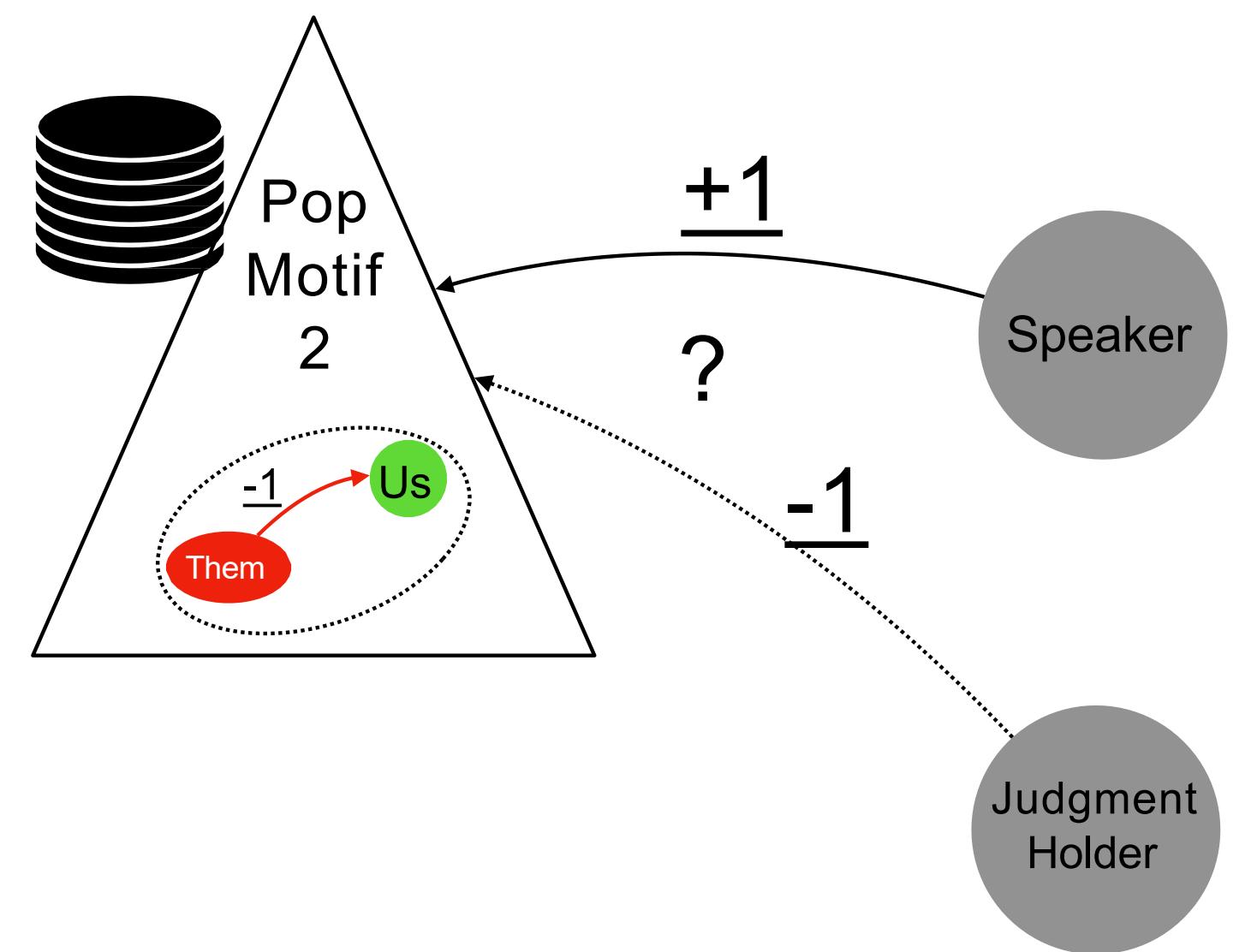
Calculate  
Judgment holder  
valence on motif

Is the speaker expressing a direct judgment in the valence?

Is the speaker taking a position (positive or negative valence) on the valence?

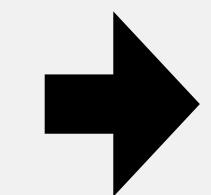
Is the speaker expressing an indirect position, such that they are talking about someone else's position?

Is the speaker taking a position on an indirect position?

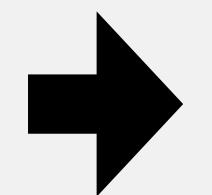


“Joe Biden wants to inflict a painful shutdown on our entire country”

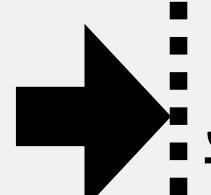
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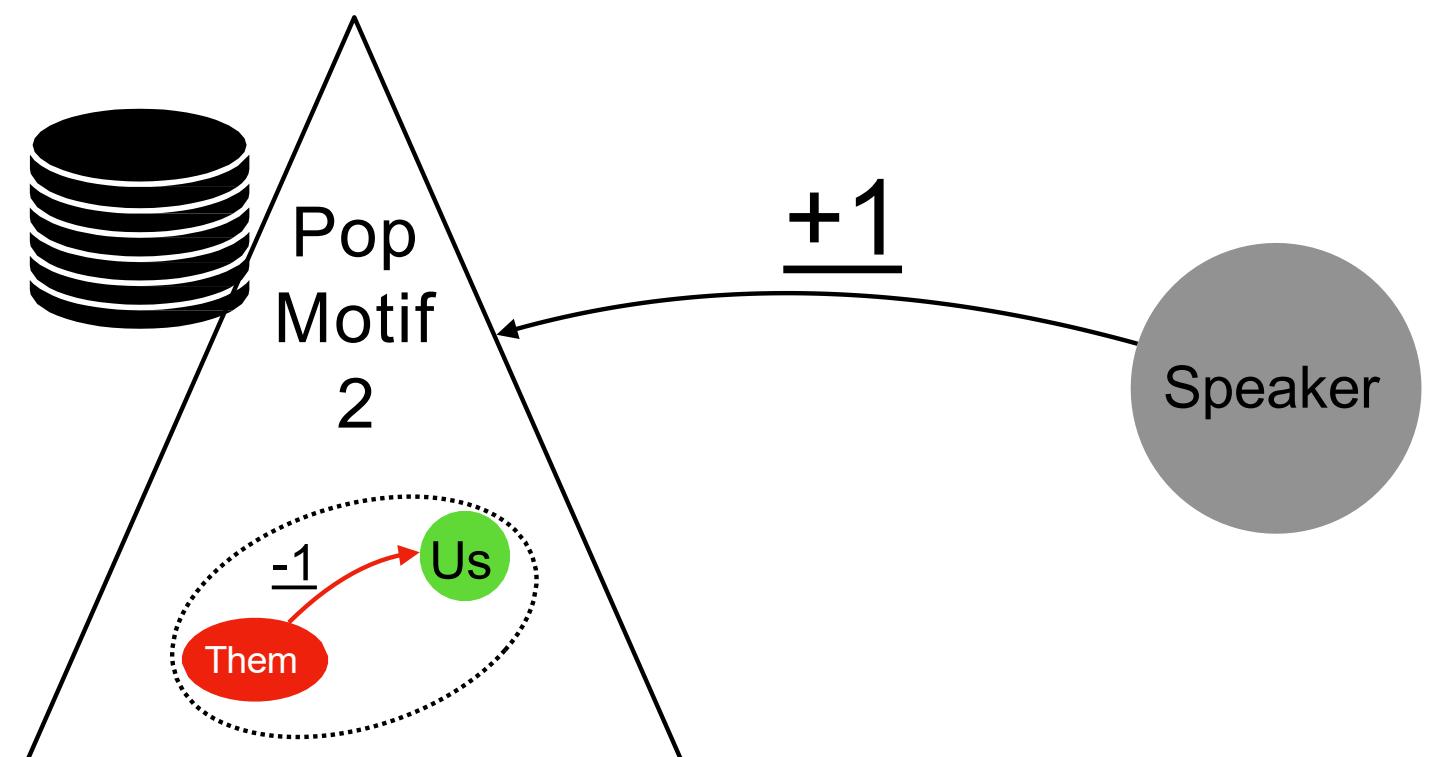
Calculate  
Judgment holder  
valence on motif

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Is the speaker expressing an indirect position, such that they are talking about someone else's position?

Is the speaker taking a position on an indirect position?

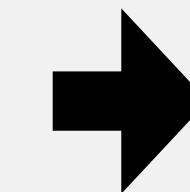


## Example 2

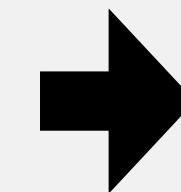
“We are engaged in a righteous crusade to liberate this nation from a corrupt political class that is waging war on American democracy”

“We are engaged in a righteous crusade to liberate this nation from a corrupt political class that is waging war on American democracy”

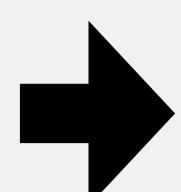
Label text, dependency parse,  
and calculate valence



Compute role and  
valence graph



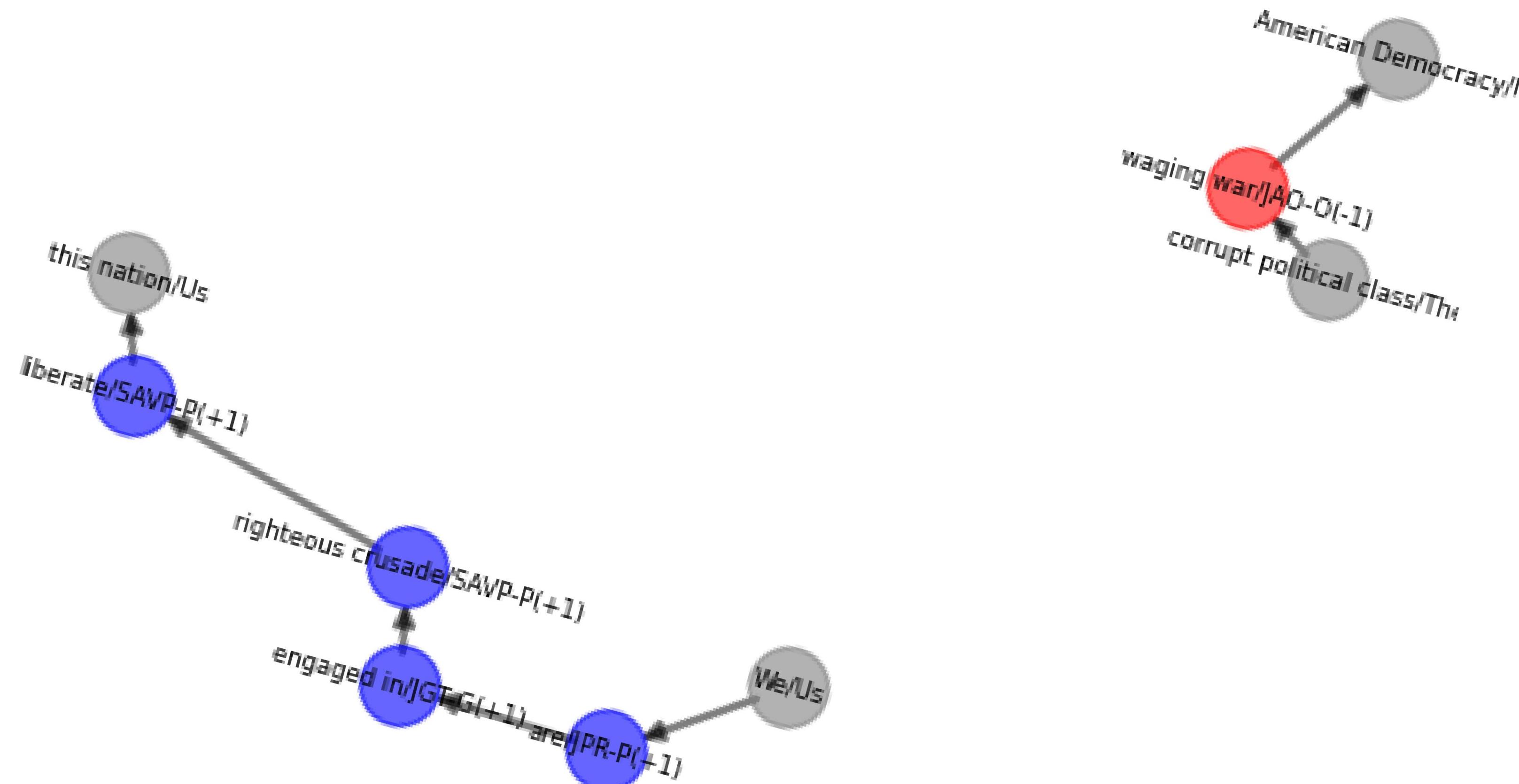
Search for motif match  
in subgraphs



Calculate  
Judgment holder  
valence on motif

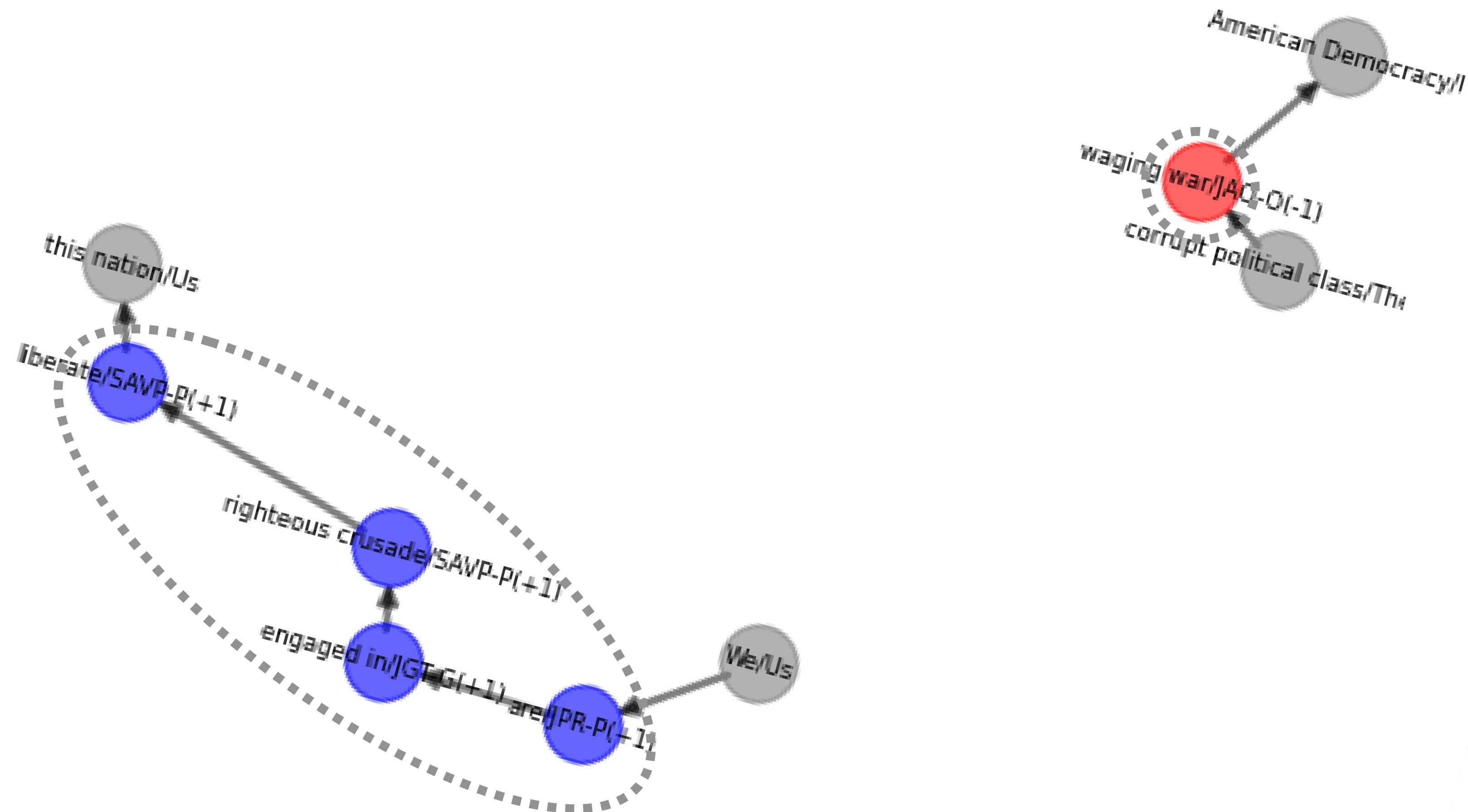
## Full Valence Graph With Labels

“We are engaged in a righteous crusade to liberate this nation from a corrupt political class that is waging war on American democracy”



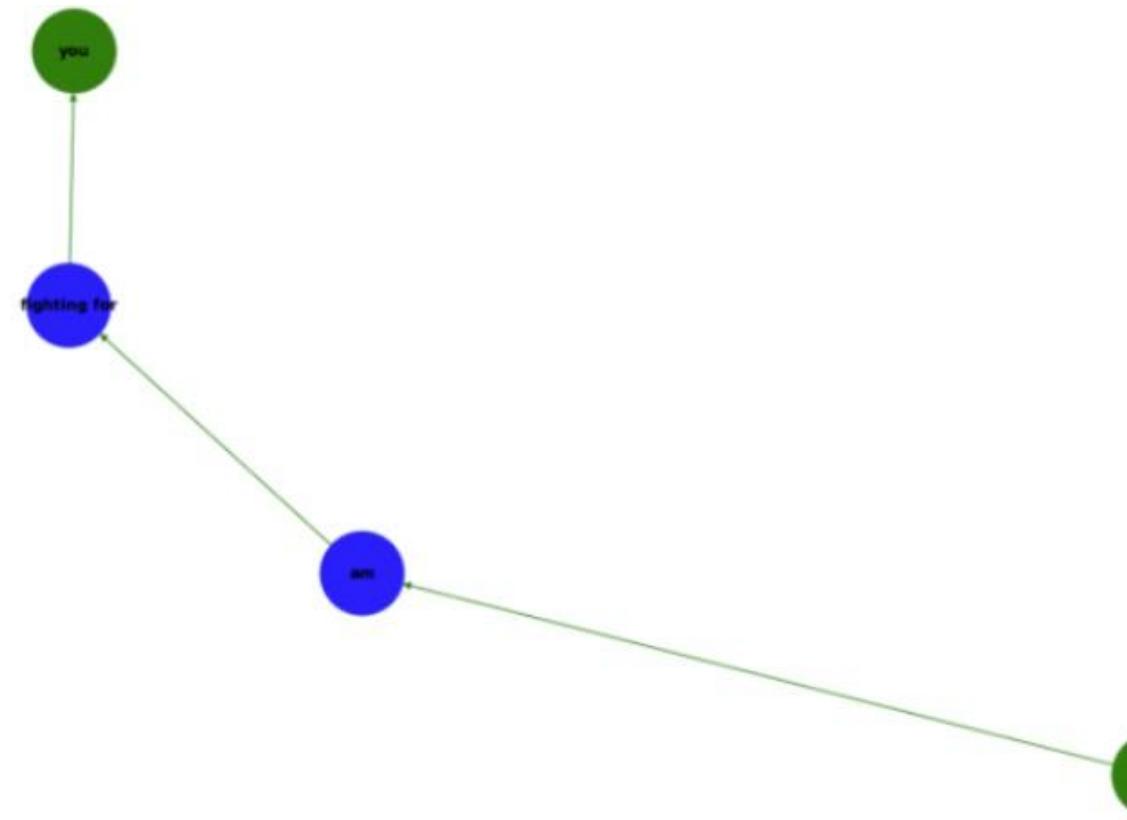
## Follow Valence Path, where path can be thought of as part of a hypergraph

“We are engaged in a righteous crusade to liberate this nation from a corrupt political class that is waging war on American democracy”

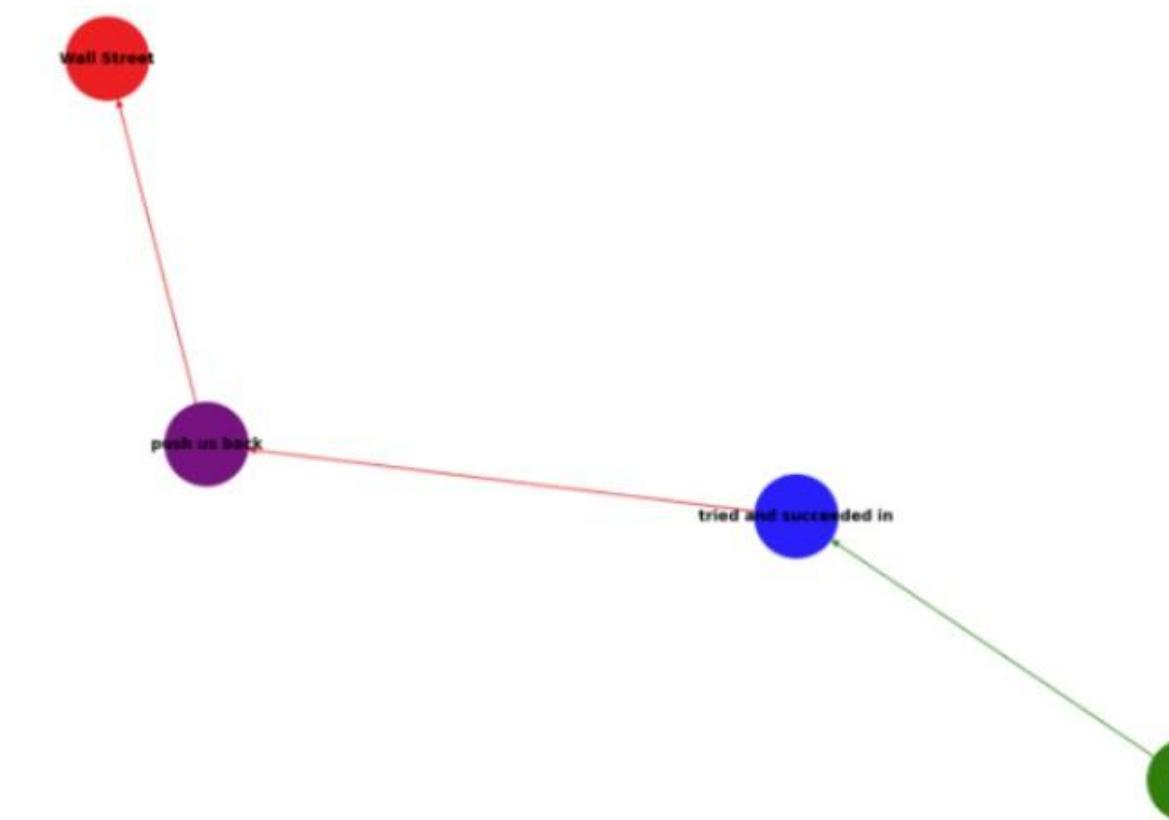


# Motifs with Graphs

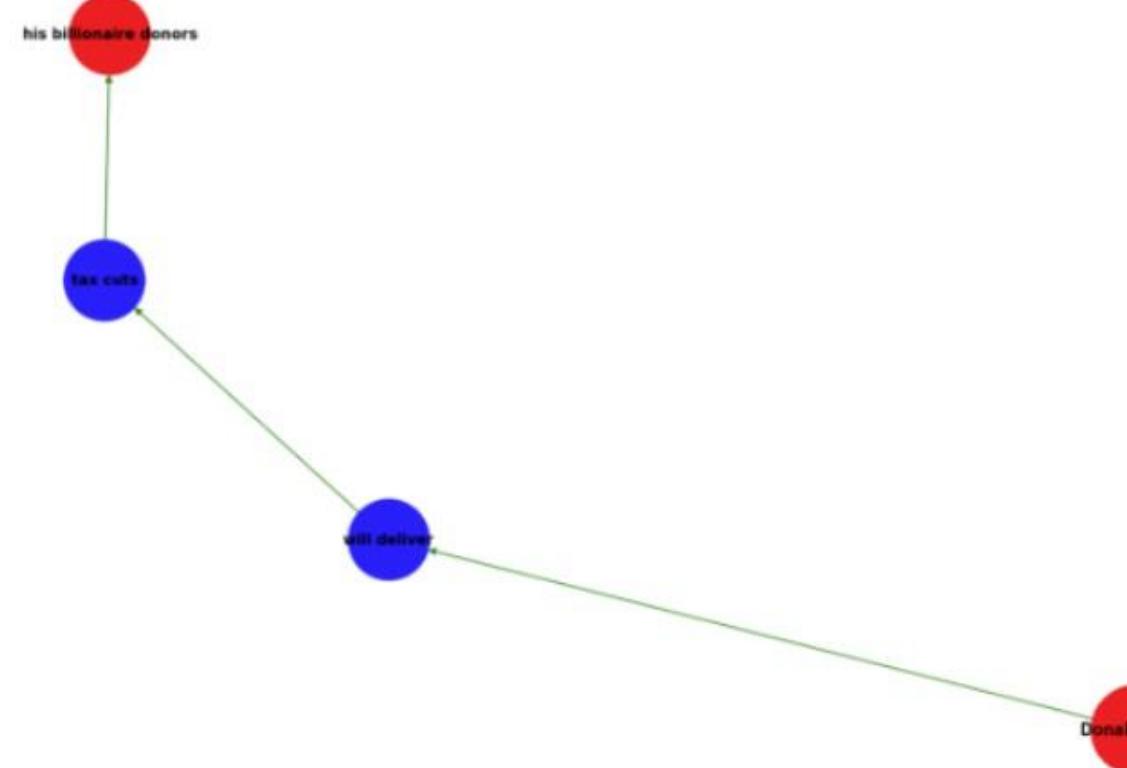
# Example Motifs with Text



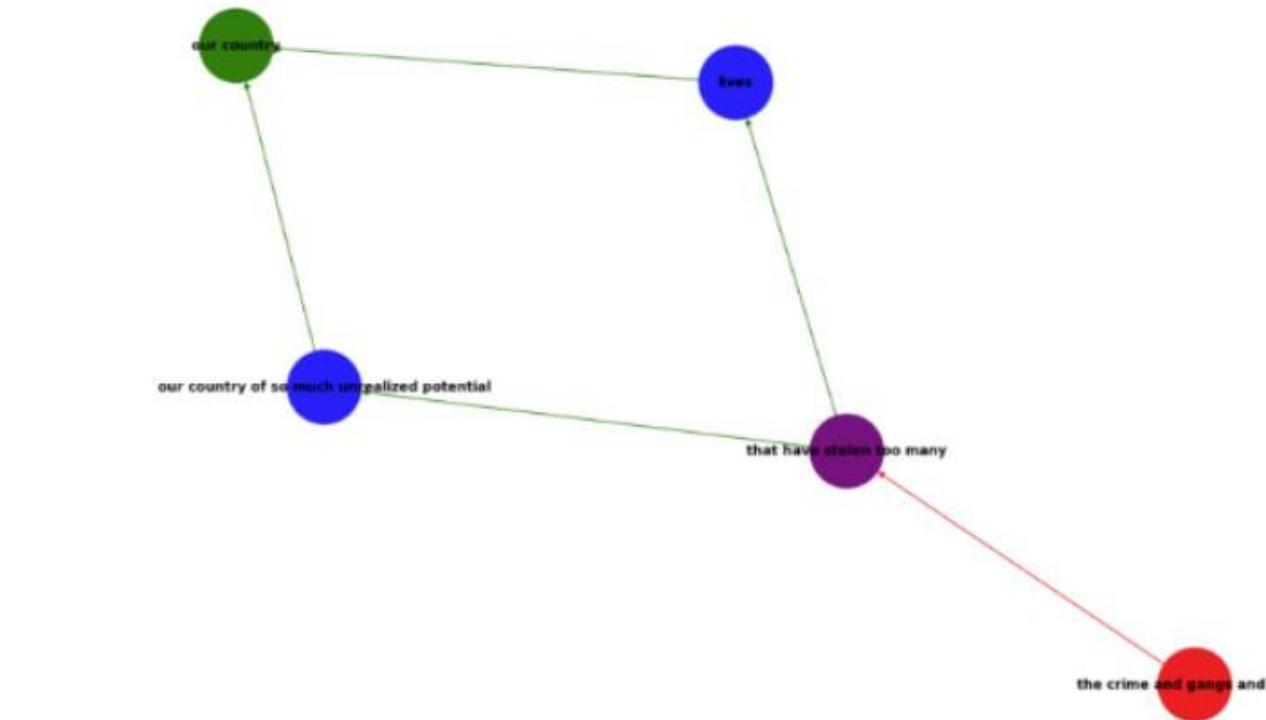
(a) (US, +, US,  
We will bring back our jobs.



(b) (US, -, THEM,)  
We tried and succeeded in reforming Wall Street.



(c) (THEM, +, THEM,)  
Donald Trump will deliver tax cuts to his billionaire  
donors.



(d) (THEM, -, US,)  
The crime and gangs and drugs that have stolen  
too many lives and robbed our country of so much  
unrealized potential.

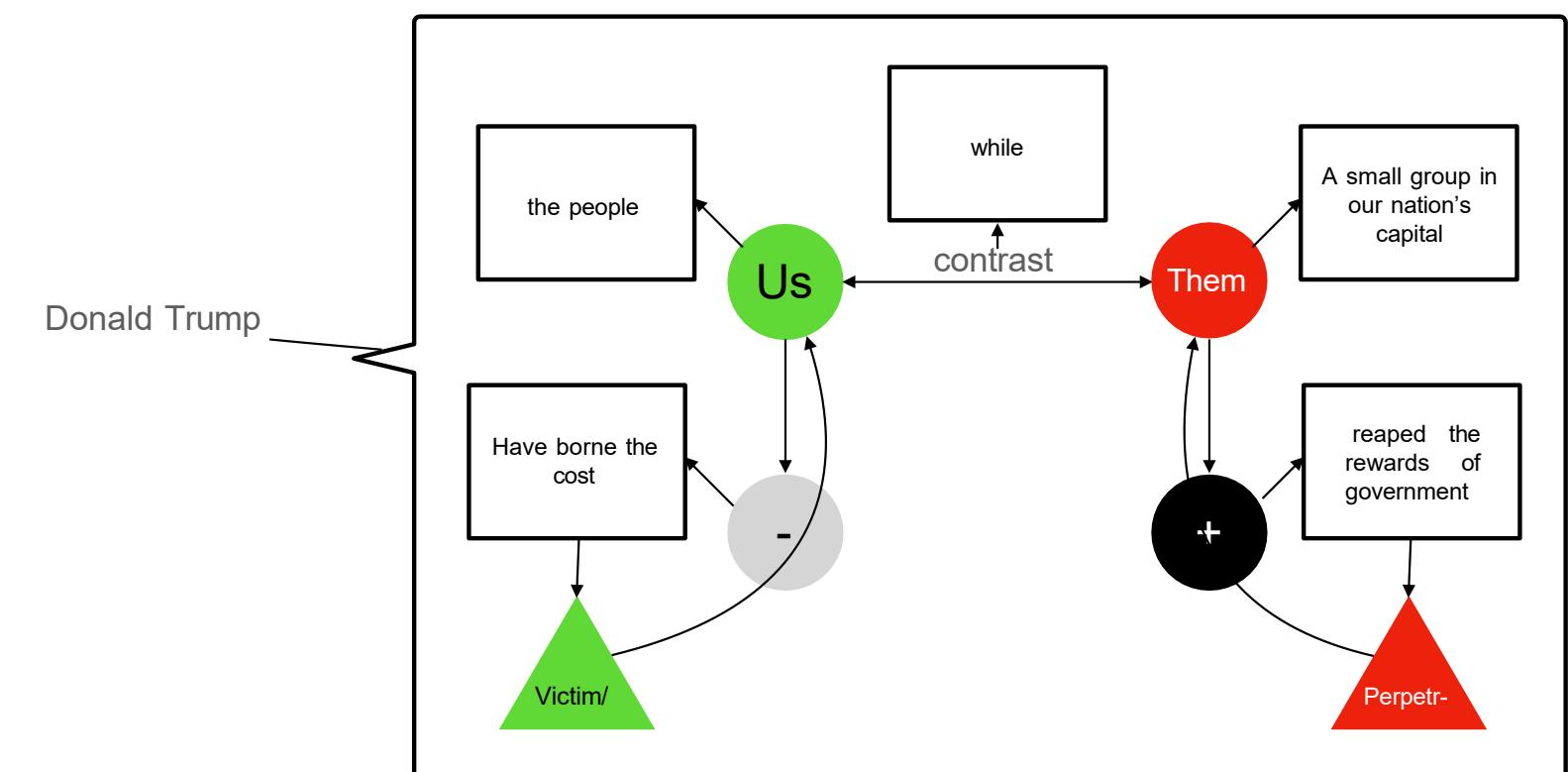
# **Example 3**

## **From Labels to Network**

# Solution: Step 1

## Cast text into a network

“A small group in our nation’s capital reaped the rewards of government,  
while the people have borne the cost”- Donald Trump



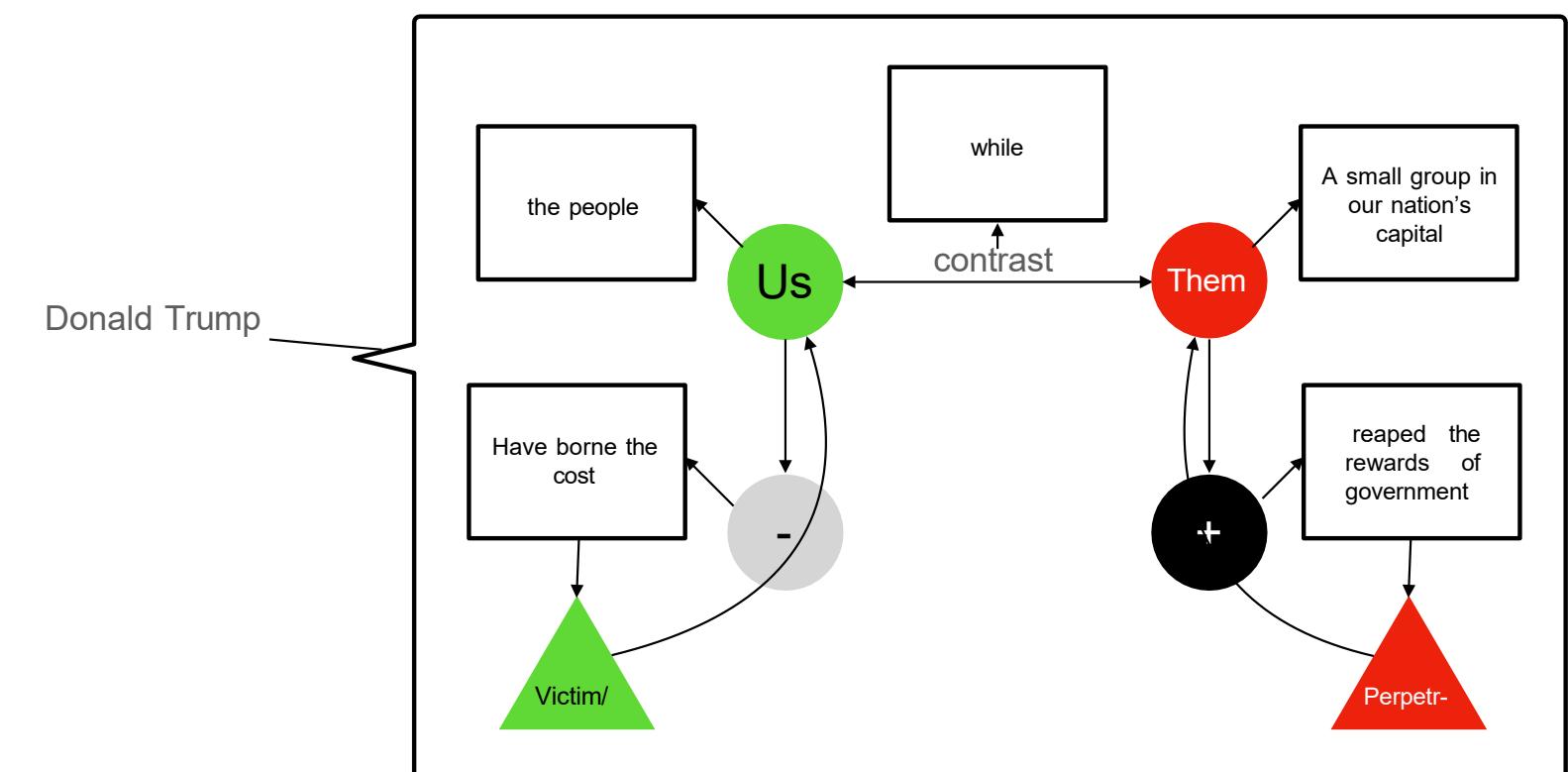
# Solution: Step 1

## Cast text into a network

Tokens as nodes,  
relations as edges

“A small group in our nation’s capital reaped the rewards of government,  
while the people have borne the cost”- Donald Trump

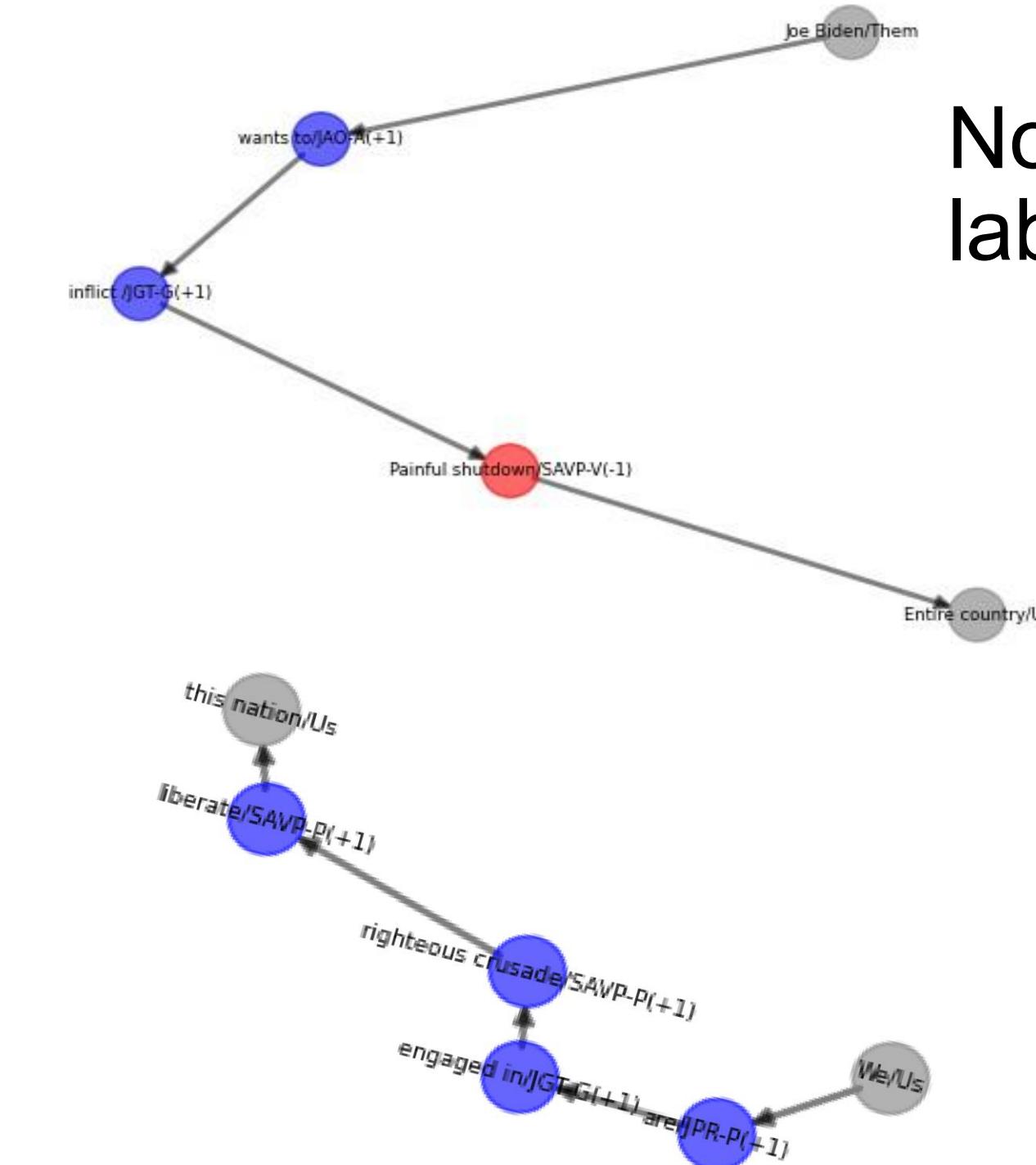
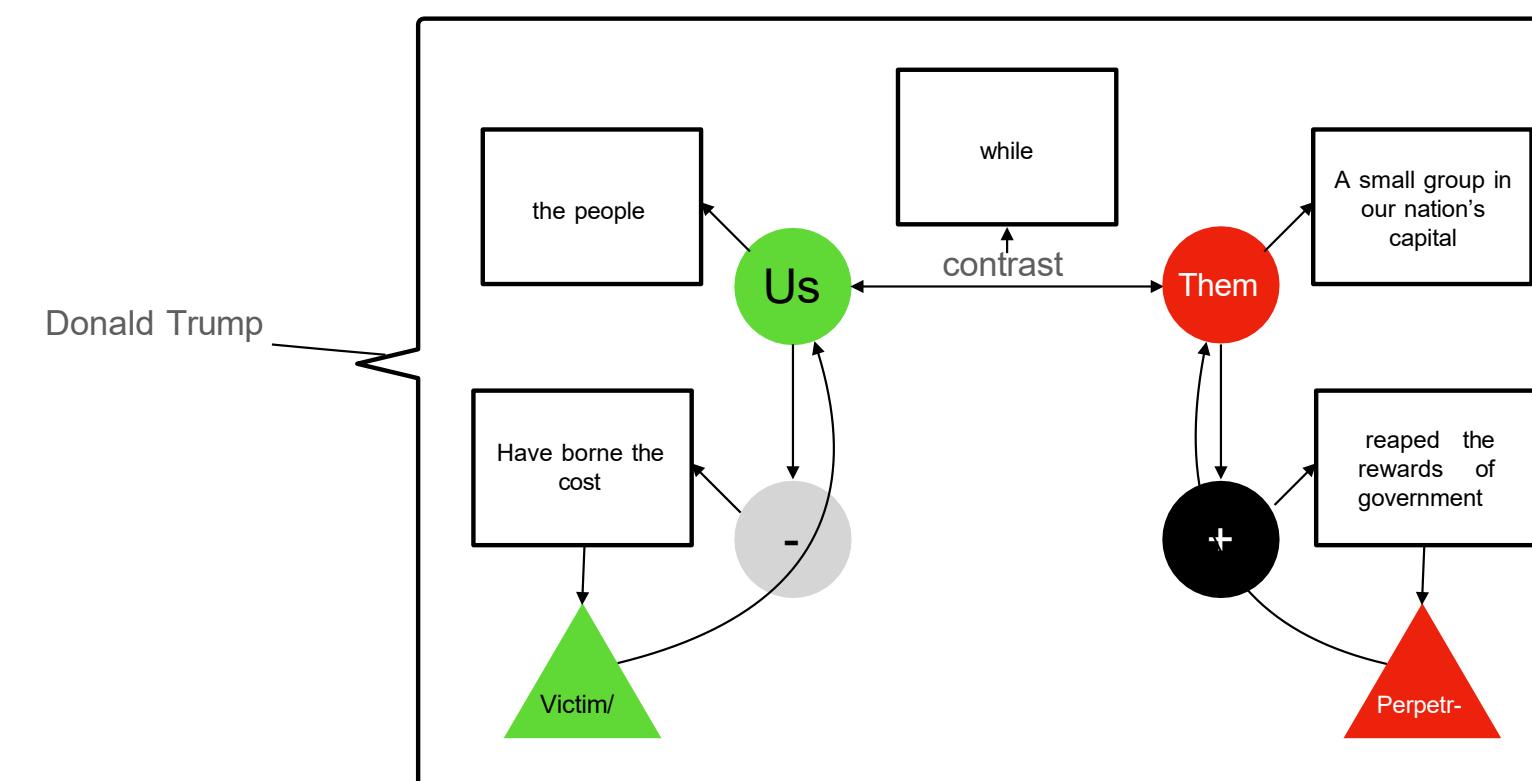
Nodes and edges have  
labels/attributes



# Solution: Step 1

## Cast text into a network

“A small group in our nation’s capital reaped the rewards of government, while the people have borne the cost”- Donald Trump



Tokens as nodes,  
relations as edges

Nodes and edges have  
labels/attributes

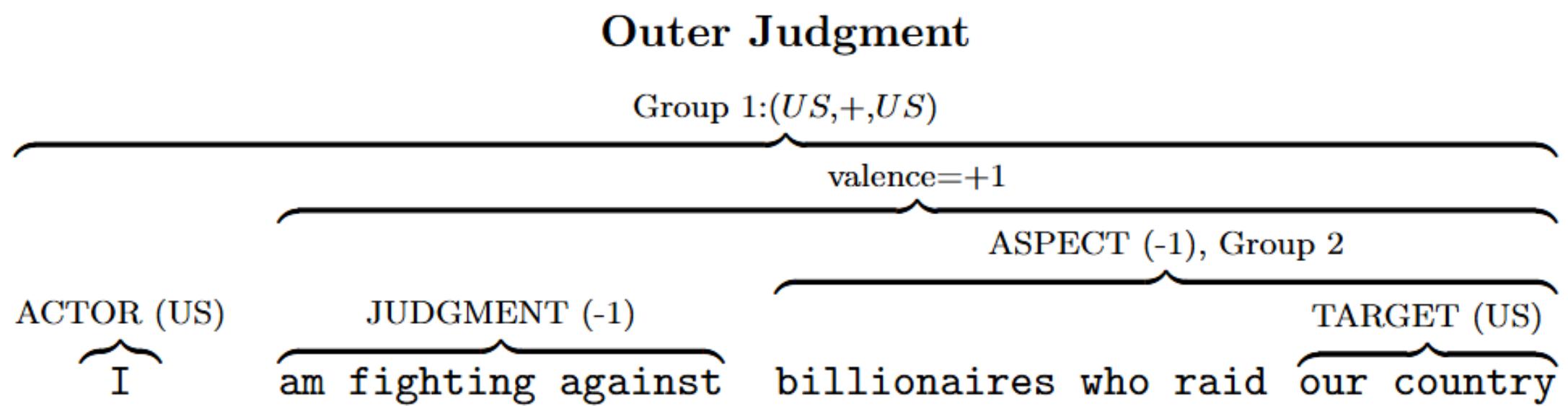
# **Complex Cases: Nested**

# Nested...

*“I am fighting against billionaires who raid our country.”*

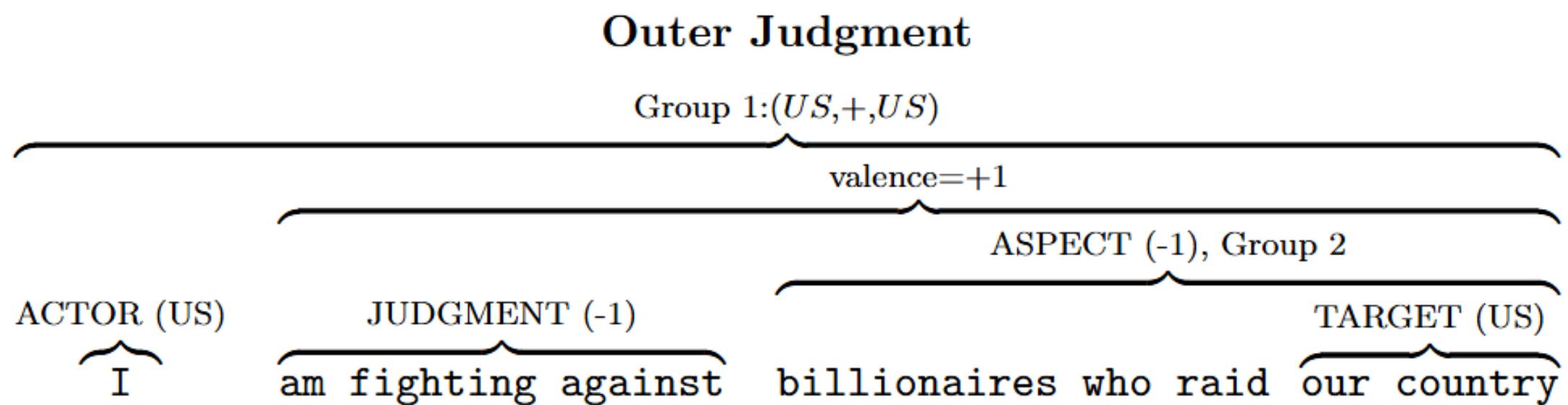
# Nested...

*“I am fighting against billionaires who raid our country.”*



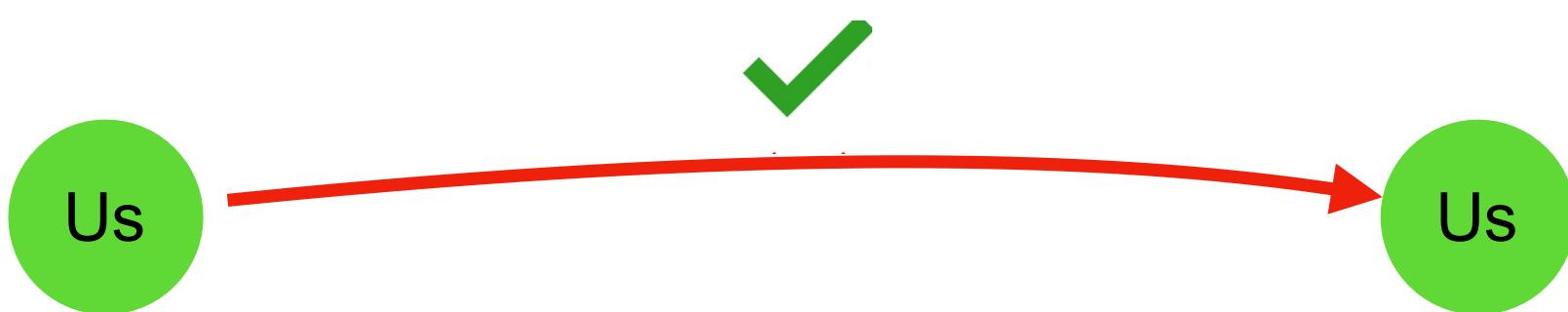
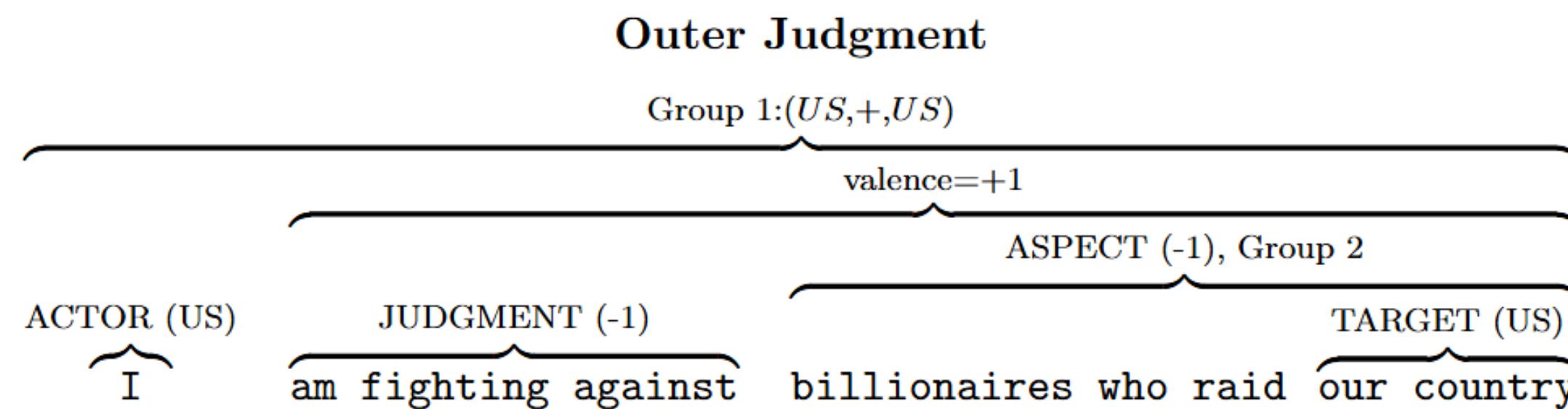
# Nested...

*“I am fighting against billionaires who raid our country.”*



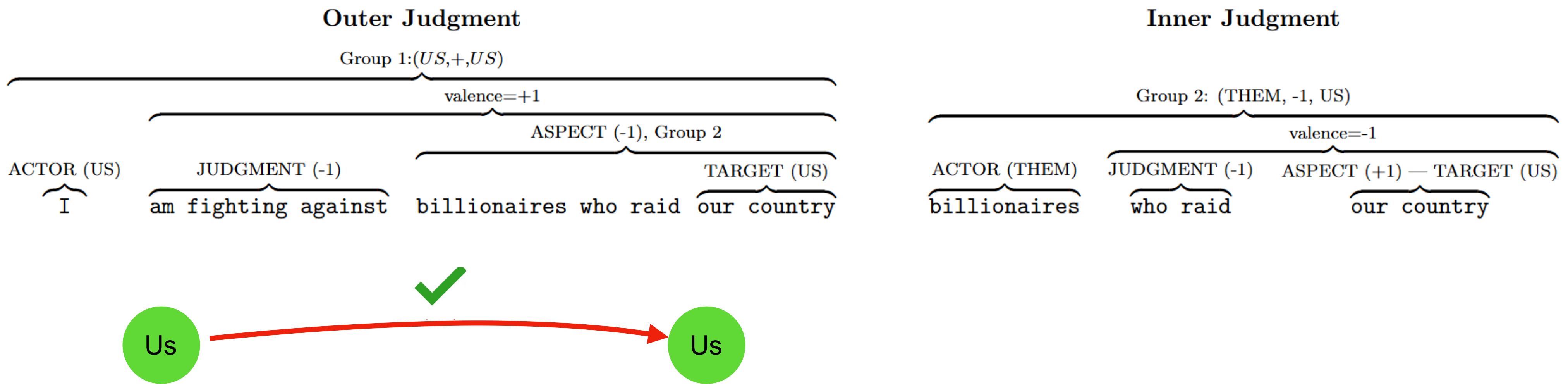
# Nested...

*“I am fighting against billionaires who raid our country.”*



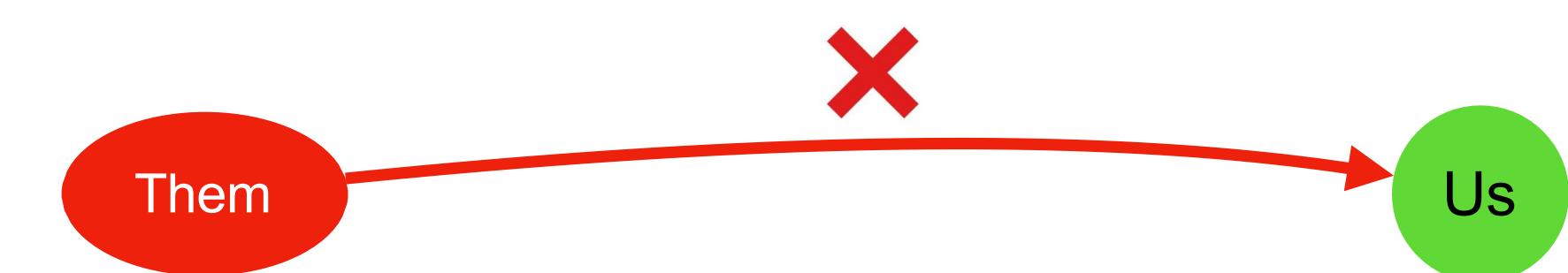
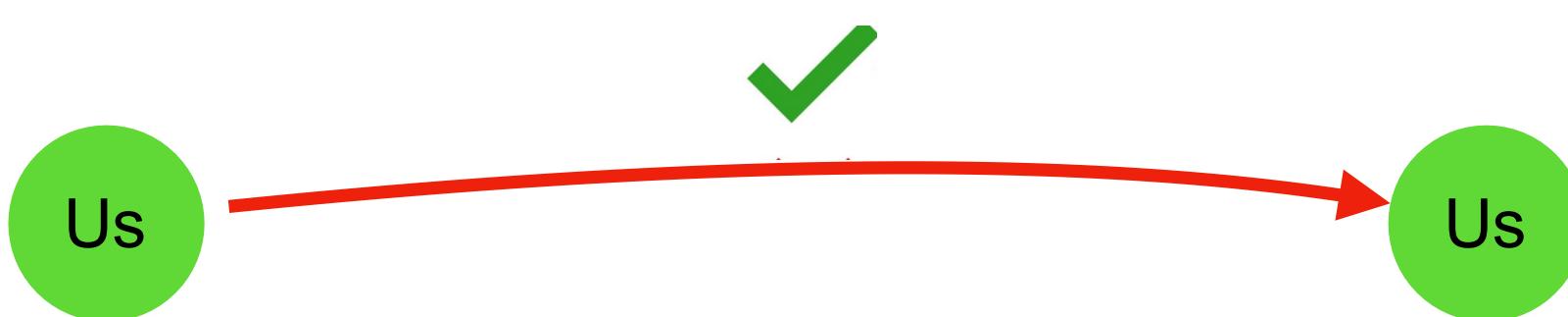
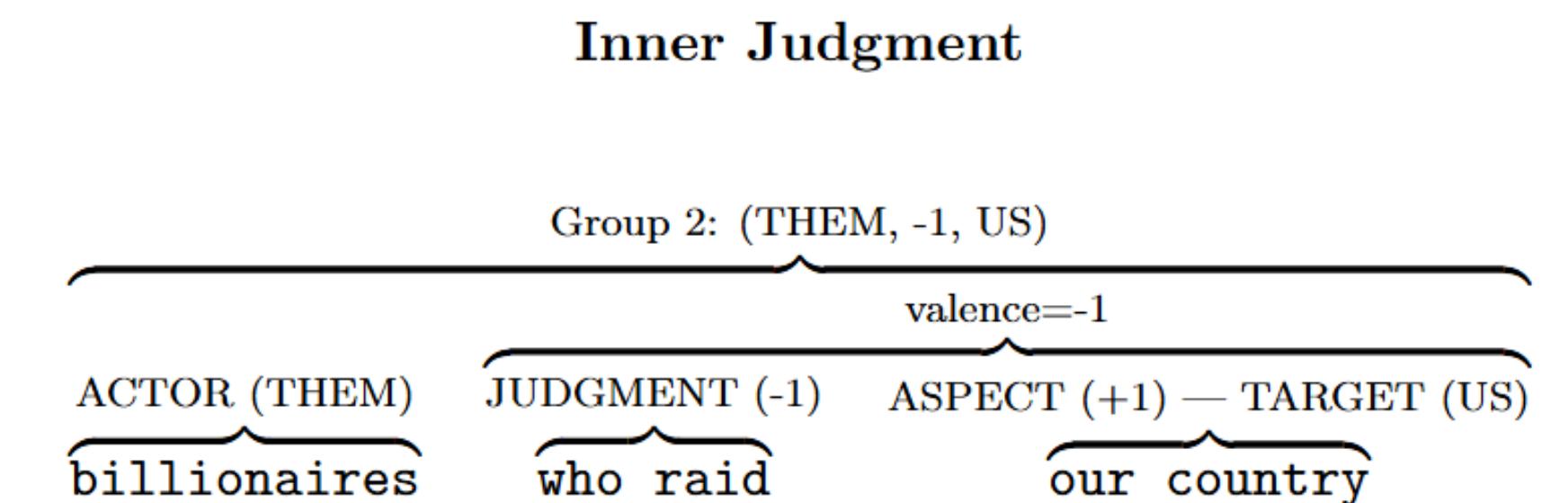
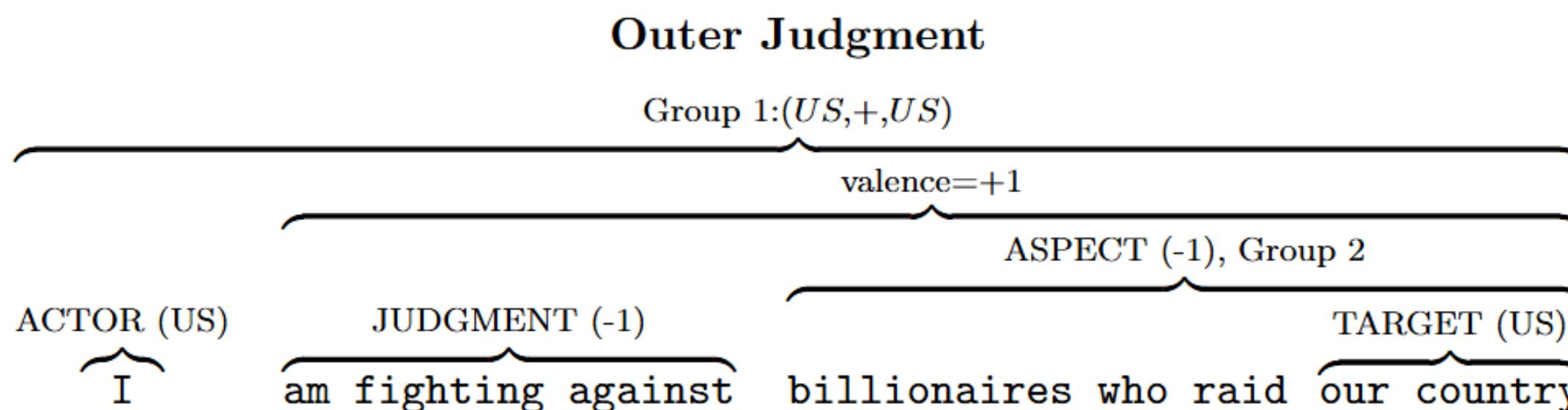
# Nested...

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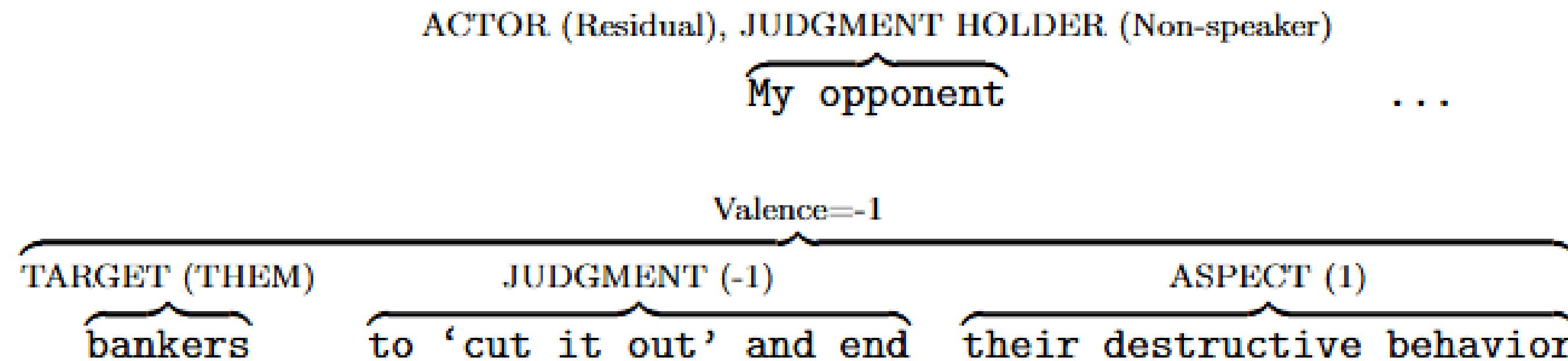
# Nested...

*“I am fighting against billionaires who raid our country.”*

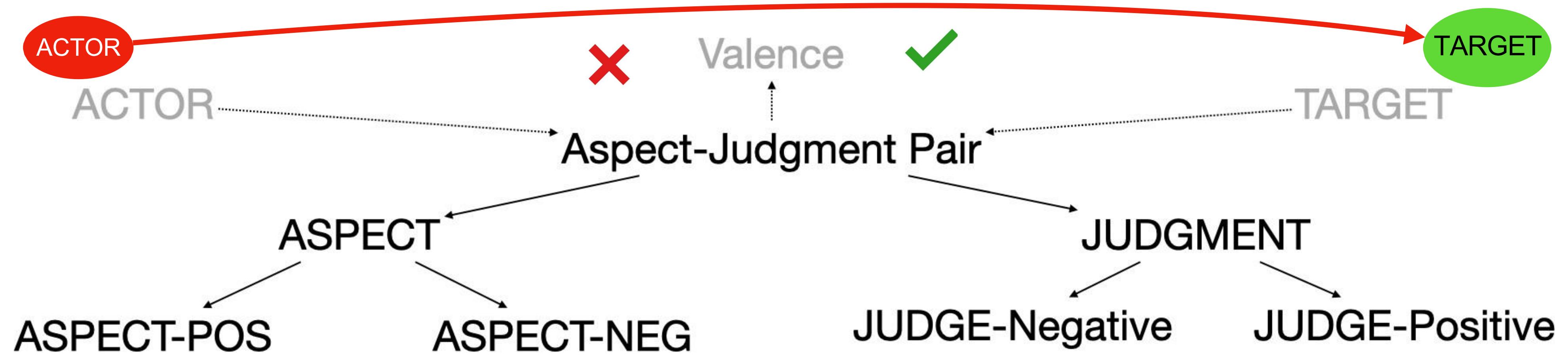


# **Complex Cases: Not the Speaker**

*“My opponent says that as a senator, she told bankers to ‘cut it out’ and end their destructive behavior, but, in my view, establishment politicians are the ones who need to ‘cut it out.’ The reality is that Congress doesn’t regulate Wall Street. Wall Street and their lobbyists regulate Congress.”*



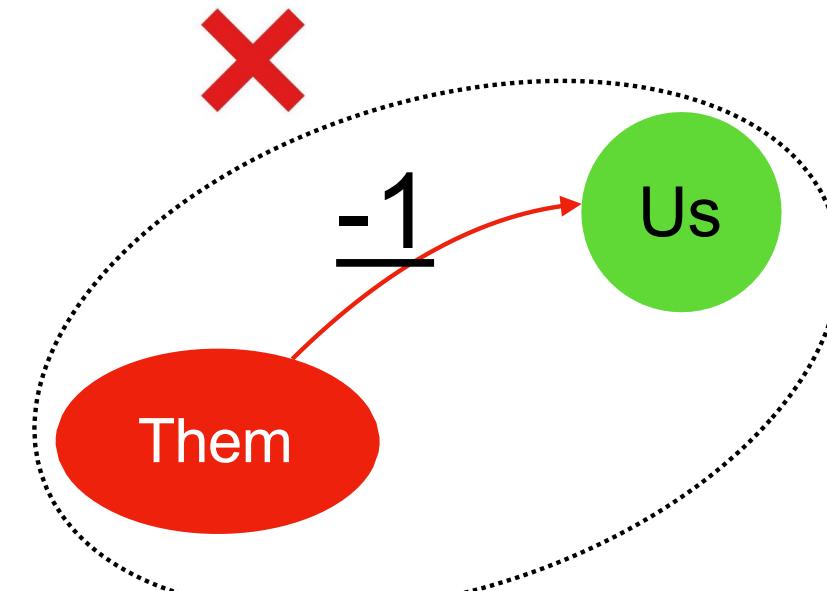
# Components



# **Populist Motifs**

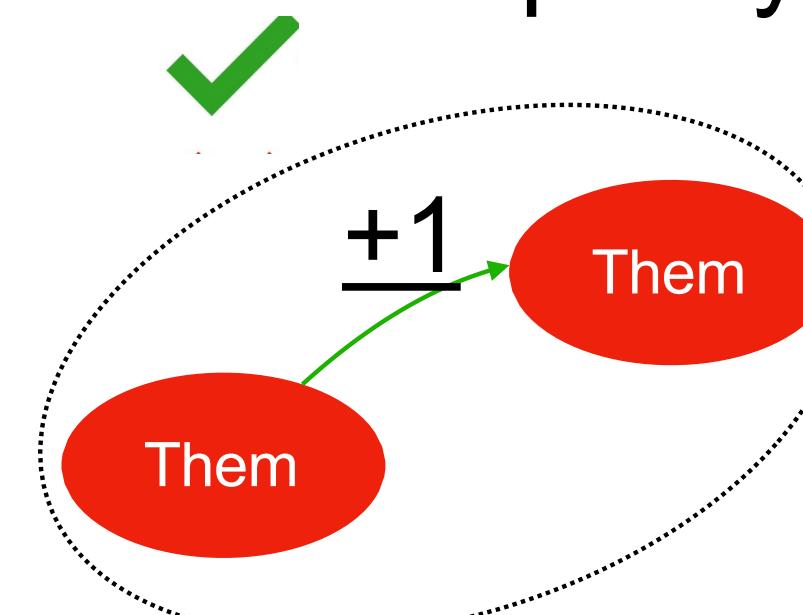
# Populist Sentence Level Motifs

Victimization



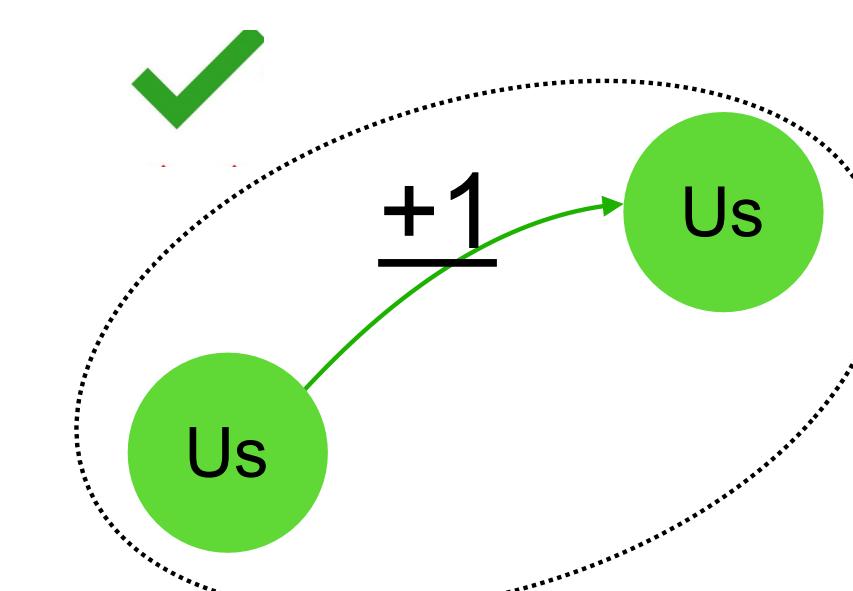
They hurt us

Elite Conspiracy



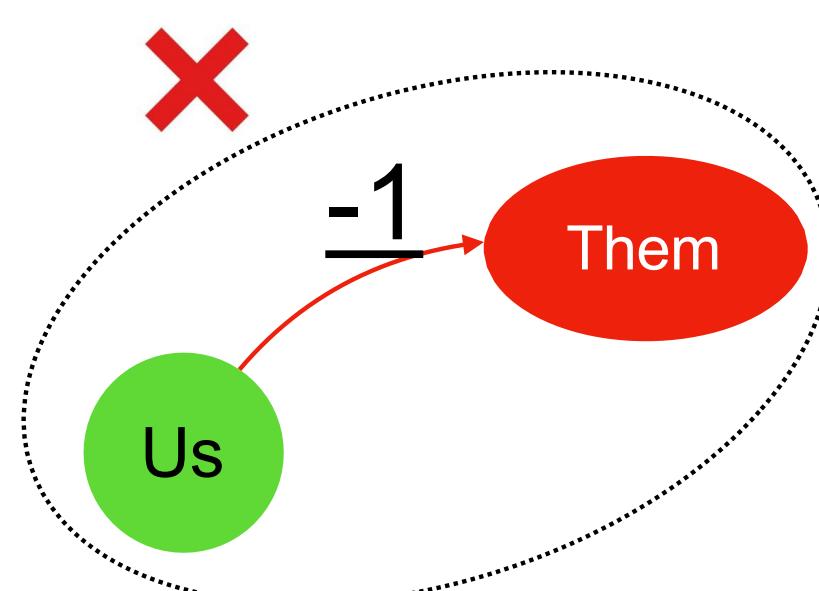
They help themselves

Empowerment

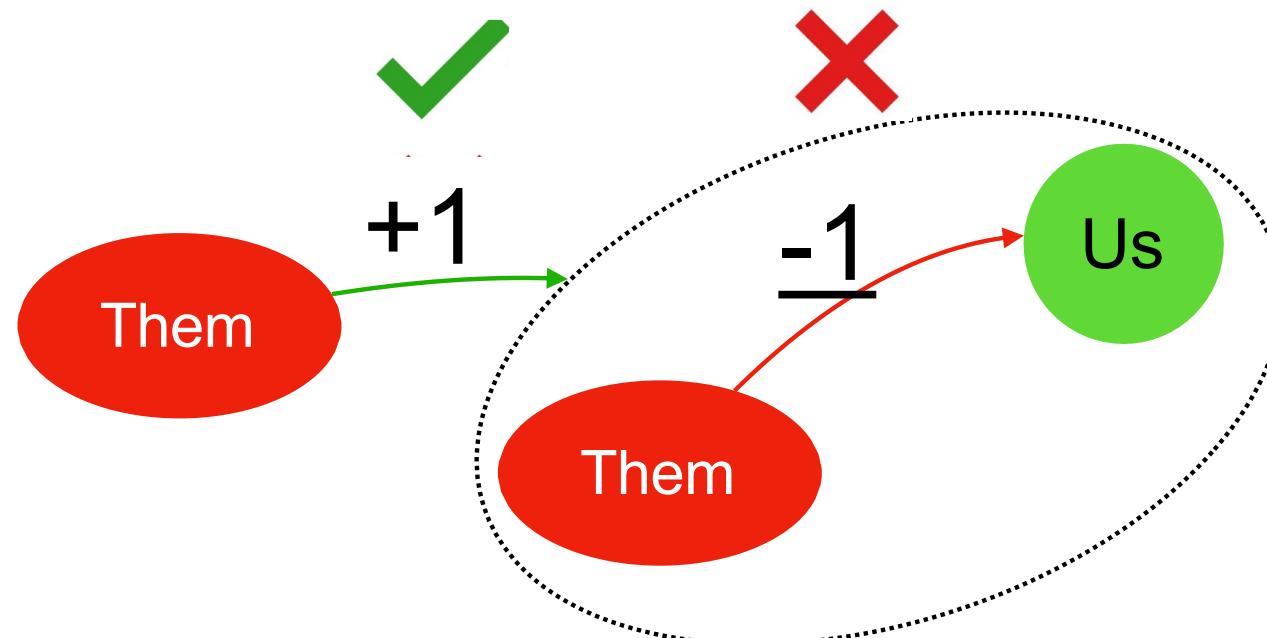


We help you/us

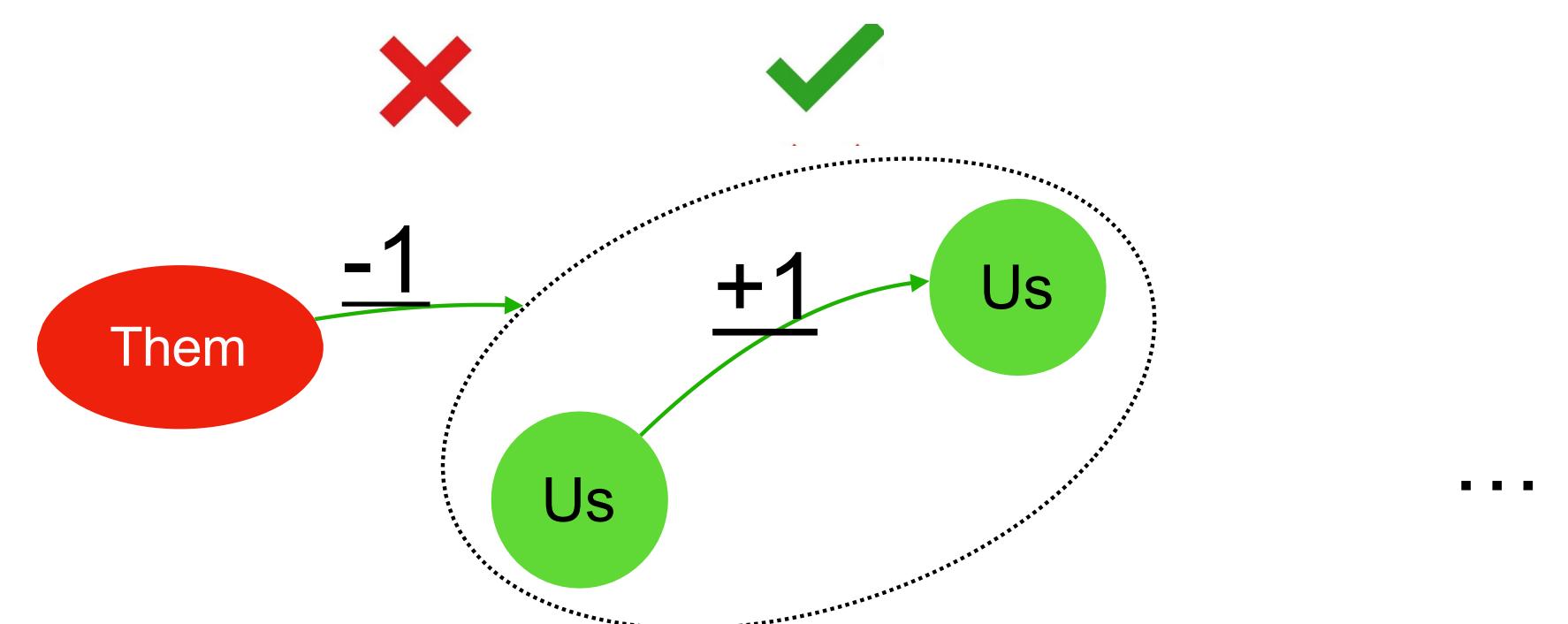
Resistance



We hurt them



They support them, and hurt us



They oppose you, we help you

# Our Approach in Action

Motif Name	Triplet	Populism Share	Republican Example	Democrat Example
Victimization Narrative	(THEM, -, US,)	0.75	For too long, a small group in our nation's Capital has reaped the rewards of government while the people have borne the cost. (Trump)	And we've seen over the last 4 years, the status quo in Washington, they are powerful and they have fought us every step of the way. (Sanders)
Empowerment Narrative	(US, +, US,)	0.73	We will bring back our jobs. (Trump)	This great nation and its government belong to all of the people, and not to a handful of billionaires, their Super-PACs and their lobbyists. (Sanders)
Elite Conspiracy Narrative	(THEM, +, THEM,)	1.00	Insiders fighting for insiders. (Trump)	Donald Trump's answer to you is the same as before: another trillion dollars in tax cuts for billionaires and big corporations. (Hillary)
Resistance Narrative	(US, -, THEM,)	1.00	We are transferring power from Washington, D.C. and giving it back to you, the American People. (Trump)	When we tried and succeeded in reforming Wall Street, they spent millions to push us back. (Obama)

## Sentence-level Precision in US Speech Sample

# The Aggregation Problem in Computational Measurement of Populist Speech

Change is coming. All the people who've rigged the system for their own personal benefit are trying to stop our change campaign because they know that their gravy train has reached its last stop. It's your turn now. This is your time. The fact that so many encrusted old political insiders oppose our campaign is the best proof you will ever need that we are fighting for real change not partisan change.

We are fighting for all Americans Democrats, Republicans, Independents, Conservatives, Liberals who've been failed by this corrupt system. We're fighting for everyone who doesn't have a voice. We're also fighting for every region of this country. For every part of Florida, and every part of America. From Pensacola to Pittsburgh, from Baltimore to Baton Rouge, we are fighting for every last city and every last person in this country. Hillary Clinton is the candidate of the past. Ours is the campaign of the future.

In this future, we are going to pursue new trade policies that put American workers first and that keep jobs in our country. All the people who got NAFTA wrong, and China wrong, and who are trying to give us the Trans-Pacific Partnership are the same failed voices pushing for Hillary Clinton. Our trade deficit with the world is now nearly \$800 billion dollars. We've lost one-third of our manufacturing jobs since Bill and Hillary Clinton gave us NAFTA. China is manipulating its currency and taking our jobs. We are going to stop companies from leaving our country and keep those jobs right here in America. The era of economic surrender is over.

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Triplet	Example (Speaker)
<b>Populist Leaders Using Non-Populist Motifs</b>	
[Residual, +, US]	<p>I will declare a national emergency at our southern border. (Trump)  At its most basic, this election is about preserving our democracy. (Sanders)  Climate change is real. It is caused by human activity and it is already causing devastating problems in the United States and around the world. (Sanders)</p>
[Residual, -, US]	<p>Mothers and children trapped in poverty in our inner cities. (Trump)  We're facing the worst public health crisis in 100 years and the worst economic collapse since the great depression. (Sanders)</p>
[US, +, Residual]	<p>Here, we memorialize the brave men and women who struggled to sacrifice, and sacrificed so much so that others might live in freedom.(Trump)  We are confronting systemic racism and the enormous threat to our planet of climate change. (Sanders)  This election is the most important in the modern history of this country. (Sanders)</p>
[Residual, +, Residual]	<p>My proudest legacy will be that of a peacemaker and unifier. (Trump)  The scientific community has spoken in a virtually unanimous voice. (Sanders)</p>
<b>Non-Populist Leaders Using Populist Motifs</b>	
[US, +, US]	<p>This generation was given the gift of the best education in American history. (Bush)</p>
[THEM, -, US]	<p>And we've seen over the last 4 years, the status quo in Washington, they are powerful, and they have fought us every step of the way. (Obama)  That's surrender to the same forces of the status quo that has squeezed middle class families for way too long. (Obama)</p>

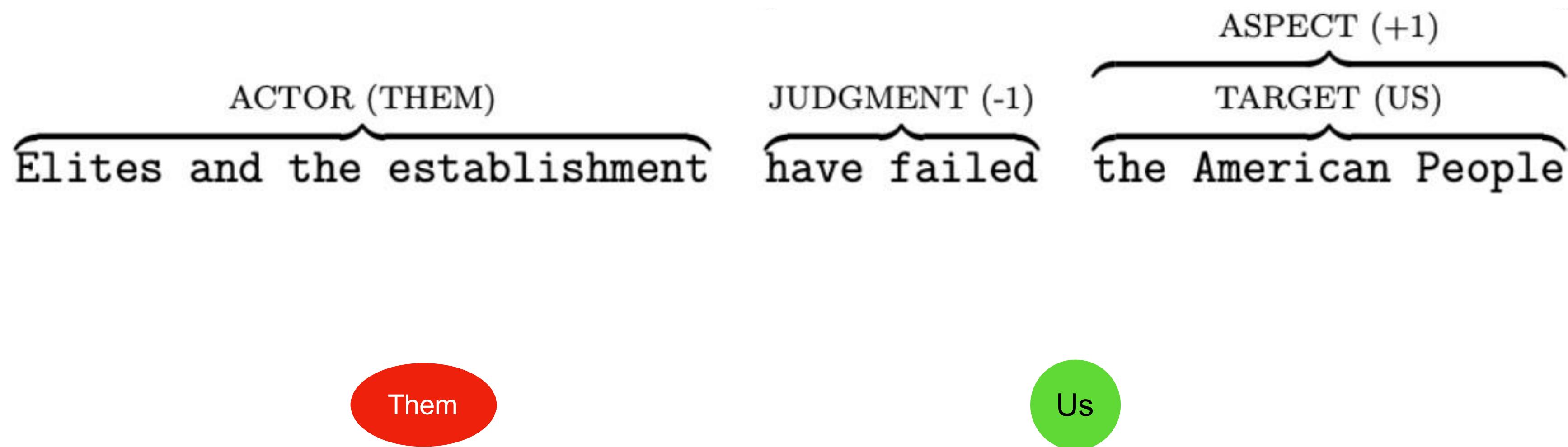
Table 6: Examples of Discourse-Speaker Mismatch in Populist Motifs

### A.7.3 Obama 8/2024, Chicago

At a time when millions of our fellow citizens were sick and dying, we needed a leader with the character to put politics aside and do what was right. At a time when our economy was reeling, we needed a leader with the determination to drive what would become the world's strongest recovery—15 million jobs, higher wages, lower health care costs. And at a time when the other party had turned into a cult of personality, we needed a leader who was steady, and brought people together, and was selfless enough to do the rarest thing there is in politics: putting his own ambition aside for the sake of the country. History will remember Joe Biden as an outstanding president who defended democracy at a moment of great danger. I am proud to call him my president, but I am even prouder to call him my friend. Now the torch has been passed. Now it's up to all of us to fight for the America we believe in. And make no mistake: it will be a fight. For all the incredible energy we've been able to generate over the last few weeks, for all the rallies and the memes, this will still be a tight race in a closely divided country—a country where too many Americans are still struggling. Where a lot of Americans don't believe government can help.

# **Example 4**

'Elites and the establishment' 'have failed' 'the American People'



Elites and the establishment

have failed

the American People

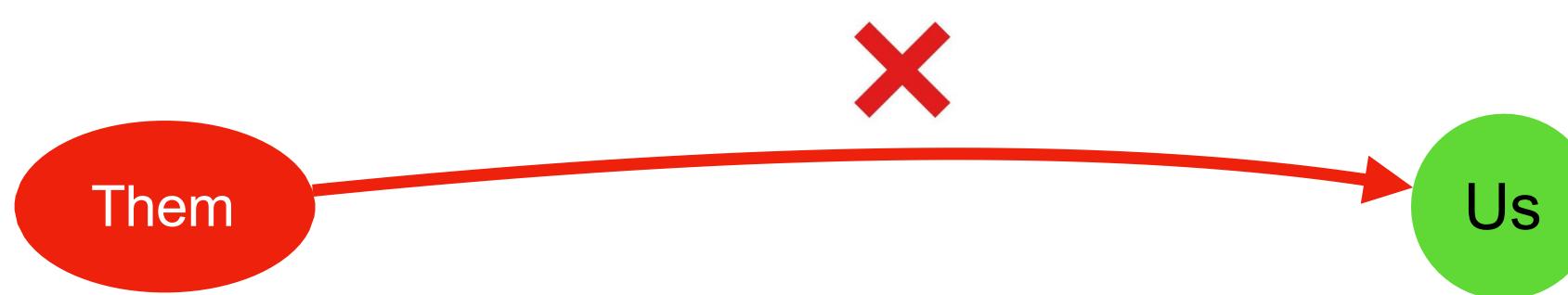
ACTOR (THEM)

JUDGMENT (-1)

Valence = -1

ASPECT (+1)

TARGET (US)



Group, (THEM, -1, US)

Valence = -1

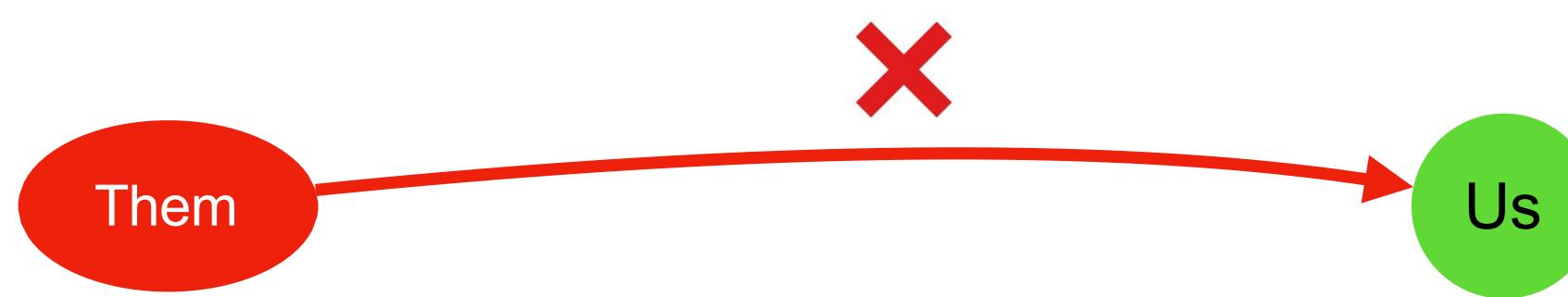
Aspect (+1)

Actor (THEM)

JUDGMENT (-1)

TARGET (US)

Elites and the establishment      have failed      the American People



(Elites and the establishment, -1, the American People)

# Aspect-Based Clustering for Political Text Analysis

→ Train a model to identify **aspect-based clusters** within political sentences.

**Task as Token-Level Clustering:**

→ Assign each token to an **aspect-defined cluster**, reframing the problem as an **n-ary relation extraction** challenge:

- Each ASPECT defines a unique cluster.
- Each cluster groups ACTOR, TARGET, and JUDGMENT entities around the ASPECT.
- Tokens without entity annotations form a "none" group.

# Methodology and Implementation

- **Why N-ary Relation Extraction?**

- Relations involve multiple interconnected entities (more than pairs).
- Allows capturing multidimensional political narratives.

- **Approach:**

1. Convert **character-indexed annotations** → **token-level labels**.
2. Preprocess annotated sentences into a format compatible with transformer-based models (e.g., BERT).
3. Train transformer models for accurate aspect-cluster predictions.

- **Tools & Dependencies:**

- Python Libraries:

- torch, transformers (BERT)

- Data: Annotated sentences in JSON format (`processed_annotations.json`).