



GINA
Information

Methodological Notes

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Key takeaways

Geopolitical Interactive Network Analysis (GINA) Information, developed by the Hague Centre for Strategic Studies (HCSS), aggregates geopolitical events reported in **news media outlets**. Examples of such events are ‘mobilizations’, ‘sanctions’, or ‘verbal agreements’, to quantify cooperation conflict intensity between states. Using the POLECAT dataset and PLOVER ontology, GINA analyzes both **verbal and material interactions** based on news coverage to offer insights into global political behavior. Examples include news-reported diplomatic consultations or humanitarian aid representing cooperation, and public accusations or military mobilizations indicating conflict.

By relying on **near real-time news data**, GINA enables users – including policymakers, analysts, and researchers – to track and compare political dynamics across states. The tool provides valuable insights into emerging geopolitical trends, helping users monitor clusters of cooperation or conflict, identify shifts in alliances, and detect changes in rivalries. This ability to analyze interactions based on media reports makes GINA a useful resource for understanding relational power dynamics globally.

Despite its strengths, GINA faces challenges, including limited data availability from regions with restricted access to information and the PLOVER ontology’s simplification of nuanced events into broader categories. Furthermore, the system struggles to fully capture emerging political events like cyber warfare and disinformation campaigns. Nevertheless, GINA’s news-based relational network offers users a high-level overview of geopolitical patterns, informing strategic decision-making and policy development.

1. Introduction

In an ever-evolving global landscape, the Hague Centre for Strategic Studies (HCSS) leads pioneering research into the complexities of geopolitical relations, analyzing interactions on global, monadic, dyadic, and network levels. Central to this effort is our Geopolitical Interactive Network Analysis (GINA) initiative, which moves beyond traditional material-based analyses to focus on the relational power dynamics that drive international interactions. GINA Information, in particular, captures these dynamics through events reported in global news sources. These include verbal cooperation, such as diplomatic consultations between states, and material cooperation, like the provision of humanitarian aid. On the conflict side, GINA tracks verbal conflict events, including public accusations between state leaders, and material conflict events, such as military mobilizations or assaults. Together, these insights provide a comprehensive view of how news outlets report on cooperation and conflict in the global political landscape.

This codebook is central to our analytical framework, offering a comprehensive categorization of various data series. By incorporating event data from POLECAT¹ and the categorization from PLOVER², we construct a quantitative overview of index and score variables. Our methodology reflects the complex geodynamics of international relations, integrating considerations such as proxy actors, statistical rigor, and standardization to enhance both precision and depth.³

GINA Information is the fourth instalment of our series of interactive network analysis tools, which also includes GINA Diplomatic, Economic and Military which were launched respectively in June, July and September 2024.

In the following sections, the reader will find a detailed description of our data series, variables, and estimation methodologies for GINA Information. Our measurements are structured into three distinct levels to enhance the precision and traceability of our analysis:

1. **Index Level:** Focus on the aggregation and normalisation of scores, facilitating comparative analysis across various datasets and temporal frames. This provides a standardised framework for interpreting raw scores within broader patterns and trends.
2. **Score Level:** Involves quantitative evaluations derived directly from our data, representing specific measurements or calculated values essential for constructing indices.
3. **Data Level:** Handles both textual and numerical information, collected from diverse sources that are mentioned in following sections.

This work establishes the foundation for our open-source tools, each designed to deepen understanding through network analysis. The integration of PLOVER ensures more accurate coding of geopolitical events, improving the relevance and granularity of our insights.

¹ POLECAT: The *Political Event Classification, Attributes, and Types* (POLECAT) is a global political event dataset, which categorizes and codes events from international news sources to track political interactions, including cooperation and conflict events based on event attributes. The dataset could be considered big data big detail, due to both its high number of records (more than 12 million news reports over six years, of which 700 thousand are unique interstate interactions) and attribute coverage (95% for first category attributes such as event type, actor country intensity score, sources and 55% on secondary category attributes such as actor name, context etc.).

² PLOVER: The *Political Language Ontology for Verifiable Event Records* (PLOVER) is an event classification ontology that replaces traditional systems like CAMEO by simplifying event types and improving the accuracy of coding political events based on the context, mode, and other factors.

³ This is the first version (Version 1.0) of GINA Information. Therefore, proxy actors, statistical rigour, and standardisation have not been fully integrated into the analysis yet.

2. Reported Cooperation Variables

A few observations should be made regarding the POLECAT dataset and the PLOVER ontology, since these are the two main components that were used in the creation of this dashboard. For a detailed description of the dataset and ontology, reading the corresponding paper(s) is recommended.⁴⁵

Firstly, accuracy of POLECAT data⁶ is dependent on the quality of the underlying sources, which can vary widely across regions and media outlets in areas with limited access or censorship, significant events may be underreported. Additionally, differing interpretations of political events can lead to inconsistencies in classification, impacting cross-regional comparisons. While POLECAT aims for real-time data, delays in processing may prevent immediate capture of rapidly unfolding events.

The PLOVER event ontology, while simplifying event classification, can lose important nuance by merging specific event types into broader categories, which limits the granularity of analysis. Its rigid predefined structure may struggle to capture complex or ambiguous political interactions that do not fit neatly into existing categories, leading to potential misclassifications. Additionally, PLOVER's approach to contextualizing events may not fully capture the dynamic, multi-layered motivations behind political actions. As political landscapes evolve, new types of events, such as certain forms of cyber warfare or disinformation campaigns, may not be adequately represented, and reliance on automated coding can introduce errors, particularly in interpreting nuanced or indirect language.

2.1. Cooperation Intensity

Category: Cooperation

Type: Numeric

Unit: Score

Source: POLECAT

Description: News based Cooperation Intensity captures the total dyadic cooperation interaction between two states and includes all PLOVER categories for the QUAD codes⁷ verbal- and material cooperation as reported by various media outlets. These include aid, retreat, cooperate, concede and consult event types. This metric aggregates all event types across states to reflect global political cooperation trends and their corresponding state leaders.

$$\text{Cooperation intensity} = \sum_{i=1}^n \text{Verbal Cooperation event}_i + \text{Material Cooperation event}_i$$

- n : Number of events that have an event intensity score > 0 .
- $\text{Verbal Cooperation event}_i$: events that have verbal or material cooperation labelled QUAD code.
- $\text{Material Cooperation event}_i$: all events that are either labelled as verbal or material cooperation.

4 Halterman, Andrew, Philip A. Schrod, Andreas Beger, Benjamin E. Bagozzi, and Grace I. Scarborough. 2023. "Creating Custom Event Data Without Dictionaries: A Bag-of-Tricks." Working paper presented at the International Studies Association, Montreal, March 2023. arXiv. <https://arxiv.org/abs/2304.01331>.

5 Halterman, Andrew, Benjamin E. Bagozzi, Andreas Beger, Philip A. Schrod, and Grace I. Scarborough. 2023. "PLOVER and POLECAT: A New Political Event Ontology and Dataset." Working paper presented at the International Studies Association, Montreal, March 2023. socArXiv. <https://osf.io/preprints/socarxiv/rm5dw>.

6 There is currently a near-real-time PLOVER-coded POLECAT event data set on Dataverse at <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/AJGVIT>. This dataset was last updated mid-august 2024.

7 PLOVER's QUAD codes is the result classification system that categorizes political events into four types: verbal cooperation, material cooperation, verbal conflict, and material conflict. In this context, it helps identify whether interactions between states involve communicative actions (verbal cooperation) or tangible actions (material cooperation).

2.2. Material Cooperation Events

Category: Cooperation

Type: Multimodal

Unit: Data

Source: POLECAT

Description: Material Cooperation Events capture physical actions that cooperative interactions between two states as reported by various media outlets. These include providing aid, retreating from a contested area, or any action that involves a physical contribution to a bilateral or multilateral cooperative effort. Material cooperation is primarily categorized by concrete actions with measurable outcomes. Each event aggregates such material interactions across states to reflect global political cooperation trends involving tangible actions. Material Cooperation Events are recorded when an event is classified with a material cooperation QUAD code.

Material cooperation event(A_i, A_j, Q, ET, EI)

- **Actor I (A_i):** Identifying the country/countries in cooperation of side A of the event.
- **Actor j (A_j):** Identifying the name and/or country/countries of side B of the event.
- **Quad code (Q):** The quad code (material cooperation here)
- **Event Type (ET):** The labelled event type, which is picked from the PLOVER ontology.
- **Event Intensity (EI):** The corresponding event intensity, which is mapped from the event type.

2.3. Verbal Cooperation Events

Category: Cooperation

Type: Multimodal

Unit: Data

Source: POLECAT

Description: Verbal Cooperation Events represent non-material, communicative actions between two or more states as reported by various media outlets. These include diplomatic consultations, verbal agreements, public statements of cooperation, and any other verbal interaction that indicates willingness to cooperate or collaborate on mutual goals. Verbal Cooperation Events capture the dialogue and consultative actions that precede or accompany material cooperation, reflecting trends in political cooperation through speech acts rather than physical actions. Verbal Cooperation Events are assigned when an event is labelled with a verbal cooperation QUAD code.

Verbal cooperation event(A_i, A_j, Q, ET, EI)

- **Actor I (A_i):** Identifying the country/countries in cooperation of side A of the event.
- **Actor j (A_j):** Identifying the name and/or country/countries of side B of the event.
- **Quad code (Q):** The quad code (verbal cooperation here)
- **Event Type (ET):** The labelled event type, which is picked from the PLOVER ontology.
- **Event Intensity (EI):** The corresponding event intensity, which is mapped from the event type.

3. Reported Conflict Variables

3.1. Conflict Intensity

Category: Conflict

Type: Multimodal

Unit: Score

Source: POLECAT

Description: News based Conflict Intensity captures the total dyadic conflict interaction between two states and includes all PLOVER categories for the QUAD codes verbal- and material conflict as reported by various media outlets. These include assault, mobilize, protest, coerce request, accuse, sanction, reject and threaten event types. This metric aggregates all event types across states to reflect global political conflict trends and their corresponding state leaders.

$$\text{Conflict intensity} = \sum_{i=1}^n \text{Verbal Conflict event}_i + \text{Material Conflict event}_i$$

- n : Number of events that have an event intensity score < 0 .
- $\text{Verbal Conflict event}_i$: all events that have verbal conflict as their labelled QUAD code.
- $\text{Material Conflict event}_i$: all events that are either labelled as verbal or material conflict.

3.2. Material Conflict Events

Category: Conflict

Type: Multimodal

Unit: Data

Source: POLECAT

Description: Material Conflict Events capture physical actions that signify hostile or aggressive interactions between two states as reported by various media outlets. These actions include armed assaults, military mobilization, economic sanctions, and other forms of tangible coercive measures that can escalate conflict. Material Conflict Events are characterized by measurable outcomes and are indicative of direct confrontational actions. These events reflect global trends in physical conflict and are coded when an event falls under the material conflict QUAD code within the PLOVER ontology. Material Conflict Events are recorded when an event is classified with a material conflict QUAD code.

$$\text{Material conflict event}(A_i, A_j, Q, ET, EI)$$

- **Actor I (A_i):** Identifying the country/countries in conflict of side A of the event.
- **Actor j (A_j):** Identifying the name and/or country/countries of side B of the event.
- **Quad code (Q):** The quad code (material conflict here)
- **Event Type (ET):** The labelled event type, which is picked from the PLOVER ontology.
- **Event Intensity (EI):** The corresponding event intensity, which is mapped from the event type.

3.3. Verbal Conflict Events

Category: Conflict

Type: Multimodal

Unit: Data

Source: POLECAT

Description: Verbal Conflict Events represent non-material, communicative actions aimed at expressing hostility or increasing tension between states as reported by various media outlets. These include verbal threats, public accusations, coercive requests, and other forms of hostile speech or rhetoric that can escalate conflict without involving physical actions. Verbal Conflict Events highlight the role of speech acts and diplomatic communications in international conflicts and are coded when an event is assigned the verbal conflict QUAD code in the PLOVER ontology.

Verbal conflict event(A_i, A_j, Q, ET, EI)

- **Actor I (A_i):** Identifying the country/countries in conflict of side A of the event.
- **Actor j (A_j):** Identifying the name and/or country/countries of side B of the event.
- **Quad code (Q):** The quad code (verbal conflict here)
- **Event Type (ET):** The labelled event type, which is picked from the PLOVER ontology.
- **Event Intensity (EI):** The corresponding event intensity, which is mapped from the event type.