Unveiling Geopolitical Dynamics: Semantic and Coherency Network Analysis of Social Media Posts from Major News Agencies in the United States and China

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Introduction: Geopolitical inquiries have emerged as key areas of study in international relations, particularly with the proliferation of digital communication channels in modern society. In this context, digital media posts of leading news agencies serve as a critical avenue for understanding and analyzing the construction of the geopolitical order. This research employs advanced computational methods, including semantic network analysis and coherency network analysis, to compare social media posts from influential news agencies: the Associated Press (AP) and Xinhua News (XH). By illuminating the co-evolution of geopolitical order in the discourse of AP and XH, this study provides valuable insights into the pivotal role of social media in shaping global politics.

Research Questions and Methods:

The eruption of the Russia-Ukraine conflict in February 2024 serves as a pivotal focal point, given its profound implications for geopolitical tensions and international relations. The study examines 103,495 tweets posted by AP (n = 53,338) and XH (50,157) over a two-year period (01/01/2022 to 01/01/2024) that encompass the conflict. The research addresses the following questions:

RQ1: Which countries are the most frequently mentioned in the tweets from the Associated Press and Xinhua News Agency?

RQ2: What are the predominant international relations topics covered in the tweets from the two news agencies?

RQ3: What is the overarching structure of international relations as depicted in the tweets from the two news agencies?

RQ4: How do the most frequently mentioned countries in the tweets from the two news agencies co-evolve over time?

RQ5: How do the predominant international relations topics reported in the tweets from the two news agencies co-evolve over time?

Results: *Top Countries Mentioned (RQ1)*

The United States ranks first in AP tweets, accounting for 33.07% of all mentions, while China dominates Xinhua tweets with a substantial 65.20%. Both agencies report extensively on events in Russia and Ukraine. XH places emphasis on developments in Hong Kong and Taiwan. There is a noticeable contrast in coverage between the Global North countries (i.e., United Kingdom, France, Germany, Israel, Italy, Japan, South Korea, Spain, and Canada), which are more prominent in AP's reporting, and the Global South countries (i.e., Pakistan, Palestine, India, Kenya, Cambodia, Mongolia, and Afghanistan), which receive greater attention from XH.

Top International Relations Topics (RQ2)

Notable topics for AP include Russia-Ukraine (2040 mentions), Ukraine-USA (499 mentions), and China- USA (359 mentions), indicating a significant emphasis on Eastern European tensions and Sino-American relations (See Figure 1). In contrast, XH frequently reports on China-USA relations (1665 mentions), followed by China-Taiwan (366 mentions) and Russia-Ukraine (344 mentions), highlighting China's focus on its bilateral ties with the US and regional affairs in East Asia.

Network Structure of International Relations (RQ3)

In the case of AP tweets (Figure 1), modularity analysis uncovers three weakly connected clusters, with the United States serving as the central hub. The Blue cluster revolves around interactions involving Ukraine, Russia, and European nations like Germany and France. The Red cluster highlights China's relationships within Asian regions, encompassing entities such as Hong Kong, Taiwan, South Korea, Japan, and India, as well as its ties with countries of the Global North such as the United Kingdom, Australia, and Canada. The Green cluster emphasizes interactions among Middle Eastern countries.

The analysis of Xinhua News tweets (Figure 2) reveals a more prominent hub-and-spoke network configuration, with China acting as a central hub connecting to numerous countries. This can be seen clearly in Figure 2. Additionally, the blue cluster within the Xinhua network underscores the Russia-Ukraine relations.
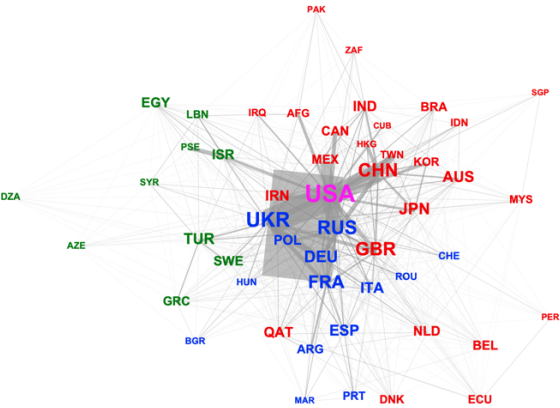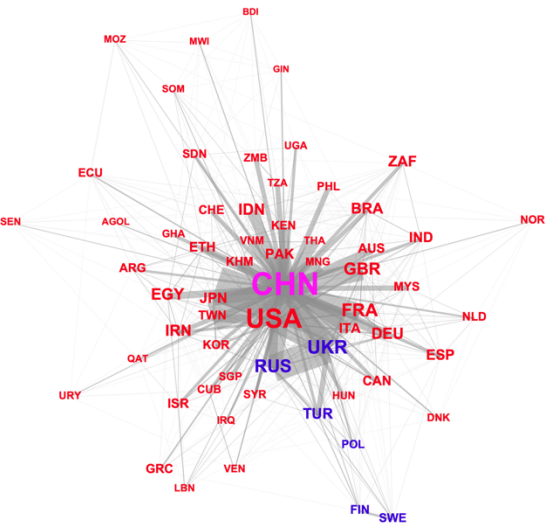

Figure 1. AP Country Co-occurrence Network

Figure 2. XH Country Co-occurrence Network

The network visualization (Figure 3) of the merged datasets illustrates a polarization within the global structure. The predominant red cluster, centered around the USA, emphasizes its relationships and leadership in the Global North. Conversely, the second-largest blue cluster, centered around China, primarily highlights its relationships and leadership in the Global South. Notably, countries traditionally aligned with the Global North, such as the United Kingdom, Canada, Australia, and Japan, exhibit a closer association with China, suggesting a shift in geopolitical alliances.

Figure 3. Combined Country Co-occurrence Network

Co-evolutions of Mentioned Countries (RQ4)

The analysis (Figure 4) indicates a notable synchronicity in the coverage of the United States, Ukraine, and Israel by both news outlets, with no discernible temporal disparities. This finding underscores a mutual focus shared by both agencies on international developments concerning the United States, Eastern Europe, and the Middle East.

Co-evolutions of the Predominant International Relations Topics (RQ5)

The examination of the coherency network (Figure 5) uncovers a significant co- evolution in the coverage of Russia-Ukraine relations and the relationships involving

Taiwan, particularly with the United States and China. Notably, there were no discernible time lags in the reporting of Russia-Ukraine affairs, indicating synchronous attention from both news agencies to this geopolitical dynamic. However, an intriguing temporal disparity emerged in the coverage of China-Taiwan relations from AP compared to the reporting of US-Taiwan relations from XH, with the former reporting significantly one day earlier than the latter.

Figure 4. Coherency Network of Mentioned Countries

Figure 5. Coherency Network of Top Country Co-occurrences

Discussion:

Digital Platforms' Role in Shaping Geopolitical Narratives

These findings suggest that news agencies tailor their coverage to align with their respective geopolitical orientations, thereby shaping the narrative surrounding crucial international relations topics. The strategic divergence between AP and XH underscores the complexity of the global information landscape, characterized by competing interests and narratives, highlighting the intricacies inherent in today's digital communication platforms.

Insights into International Relations Networks from Major News Agencies' Digital Posts

While AP exhibits a more fragmented network structure, indicative of diverse geopolitical narratives, XH displays a more centralized structure, highlighting China's role as a key nexus of international relations discourse. The visualization of the merged datasets underscores the polarization within the global structure, with the USA and China leading separate clusters representing the Global North and Global South, respectively. The closer association of traditionally aligned Global North countries with China suggests a potential shift in geopolitical alliances and power dynamics, with implications for global governance and cooperation.

Dynamics of International News Coverage

The significant synchronicity in the coverage of key countries such as the United States, Ukraine, and Israel by both AP and XH suggests a convergence in news agendas, indicating mutual interests or priorities in pivotal geopolitical regions and events.

However, the observed temporal disparity in the coverage of Taiwan's relations with China and the USA by AP and XH can be seen as a reflection of the complex dynamics at play in the negotiation of global narratives. Each news agency operates within its own institutional framework, guided by its editorial policies, audience preferences, and strategic objectives. In this context, the timing of news coverage becomes a crucial aspect of negotiation, as agencies strive to stay relevant and competitive in the rapidly evolving digital media landscape.