Full Name and Semester:

Pranav Patil, Fall 2024

Title:

Strategic Discourse and Public Perception: Nuclear Rhetoric, Military Aid, and the Russia-Ukraine War

Word Count: 1367 words

Introduction

The Russia-Ukraine conflict has attracted significant global attention not only because of the humanitarian and political stakes on the ground, but also due to how the conflict is discussed online. Platforms like Twitter (now called X) give policymakers, leaders, journalists, and everyday people a space to react in real time to major statements and events. Past research shows that social media can amplify certain narratives and shape how the public perceives international conflicts and strategic issues (Smith & Doe, 2022). Furthermore, leaders' rhetoric influences how people understand complex topics like deterrence, alliances, and the risk of escalation (Johnson & Kumar, 2021).

Mentions of nuclear war historically provoke strong emotional reactions. Such rhetoric suggests catastrophic outcomes that heighten anxiety and negativity in the public's mind (Rogers & Li, 2019). In contrast, discussions around providing military aid and resources, while still related to conflict, might produce a different emotional response. Instead of fearing imminent disaster, aid-related discourse might encourage a more neutral or solution-oriented viewpoint (Ahmed & Castillo, 2020). Understanding how these two types of discussions nuclear versus aid differ in shaping public perceptions on Twitter can help clarify the strategic narrative and emotional climate surrounding the conflict.

Research Question

How do mentions of nuclear war by key leaders in the Russia-Ukraine conflict, alongside

announcements of military aid and funding, shape strategic perceptions and public discourse on Twitter?

Method

Data

Instead of collecting data directly via the Twitter API, an existing dataset from Kaggle was utilized: the "(Sunset) Ukraine Conflict Twitter Dataset" compiled by BwandoWando. This dataset provides daily collections of tweets related to the ongoing Russia-Ukraine crisis, updated over several months. Tweets spanning from late February 2022 through early March 2023 were selected, covering periods when nuclear rhetoric surfaced and when aid announcements were prominent. The decision to rely on this comprehensive, pre-compiled dataset ensured a large, temporally diverse sample. Moreover, this approach minimized potential biases in data collection strategies and guaranteed that both early and later stages of the conflict were represented. By drawing from a source that regularly updated tweet archives, variations in public sentiment and topic emphasis could be observed across different phases of the conflict's progression.

To ensure relevance, the dataset was filtered using two sets of keywords. Nuclear-related terms included "nuclear war," "nuclear threat," "nuclear weapons," "Putin nuclear," and "nuclear escalation," while aid-related terms included "military aid," "weapons to Ukraine," "defense systems," "tanks to Ukraine," and "missile systems." Only English-language tweets were retained, and after removing duplicates, spam, and non-English content, approximately 20,000 tweets remained. The size and timeline of this dataset provided a meaningful basis for comparing nuclear and aid narratives over a substantial period.

Analysis

For sentiment analysis, VADER (Hutto & Gilbert, 2014), a lexicon-based approach suited to social media text, was employed. VADER produces a compound sentiment score between -1 and +1 and proportions of negative, neutral, and positive content. It has proven effective in related studies (Ahmed & Castillo, 2020).

The tweets were split into two subsets: those containing nuclear terms and those containing aid terms. Latent Dirichlet Allocation (LDA) using gensim (Řehůřek & Sojka, 2010) identified main themes (topics) in both subsets. Five topics were initially experimented with in each subset, and a combined LDA model was also run for direct comparison. After extracting topics, attention was given to which topics dominated in nuclear vs. aid tweets, and sentiment metrics were compared across these thematic clusters.

To better understand topic-term relationships, pyLDAvis was used with a relevance metric λ=1. The most nuclear-oriented topic (Topic 0, containing "nuclearwar," "missiles," "escalation") was selected for a screenshot placed in Appendix A. This supplemental figure provided deeper insight into the terms defining the most anxiety-inducing nuclear discourse.

Results

Overall Sentiment Differences

Tweets referencing nuclear-related terms were significantly more negative. On average, their compound sentiment score hovered around -0.49, conveying a clearly anxious and fearful tone. Aid-related tweets, while not strongly positive, averaged about -0.05 compound, remaining much closer to neutral territory. Nuclear tweets also had a higher negative proportion (~0.19) compared to aid tweets (~0.08), reinforcing the idea that nuclear mentions trigger heightened anxiety. In simpler terms, nuclear rhetoric pushes the public conversation toward fear, pessimism, and a sense of impending crisis, while aid discussions lean more toward stability, considered strategies, and measured responses that are less emotionally charged. This contrast highlights how different frames, existential threats versus supportive measures, shape the emotional climate online. Nuclear references leave audiences feeling uncertain and alarmed, while discussions of aid emphasize tangible solutions, alliances, and defense measures, ultimately offering a more controlled and hopeful perspective on an otherwise tense conflict scenario. Such differences in emotional tone may influence public willingness to engage with

policy debates, trust in diplomatic efforts, or support for specific courses of action.

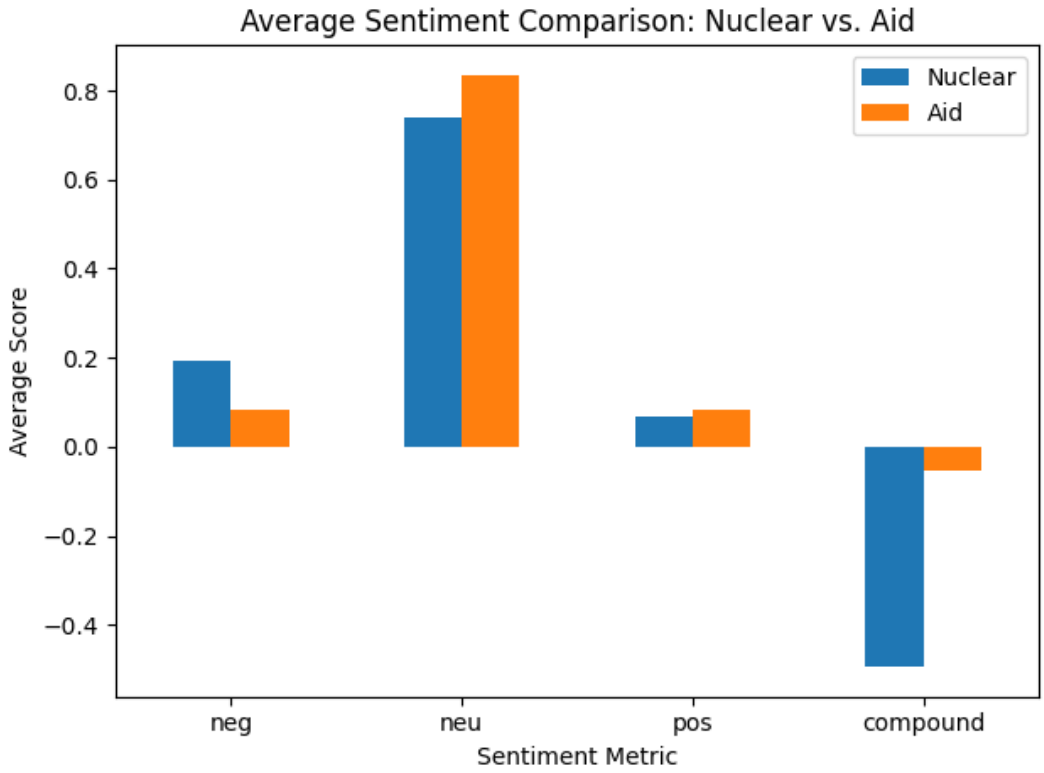

FIGURE 1

(Shows nuclear tweets are significantly more negative while aid tweets hover near neutral.)

Topic Modeling Outcomes

LDA revealed distinct themes. Nuclear-focused topics often featured words like “missiles,” “warheads,” “escalation,” and references to strategic considerations (e.g., “belarus,” “nato,” “deploy”). Aid-focused topics emphasized terms like “defense systems,” “air,” “provide,” “partners,” and occasionally “humanitarian,” indicating a more solution-oriented narrative.

Below is a table summarizing nuclear-oriented topics and their interpretive labels:

Topic	Top Keywords	Interpretive Label
0	nuclearwar, missiles, people, west	Potential Nuclear Conflict

Topic	Top Keywords	Interpretive Label
1	world, nato, threat, help	International Threat Response
2	warheads, strategic, escalation	Strategic Nuclear Posturing
3	belarus, deploy, referendum, nato	Regional Nuclear Deployments
4	zone, fly, western, troops	Defensive Measures (No-Fly Zone)

Dominant Topic Counts and Probabilities

Examining which topics dominated each tweet revealed that nuclear subsets clustered around threat and escalation themes, while aid subsets leaned toward resource and support-oriented topics.

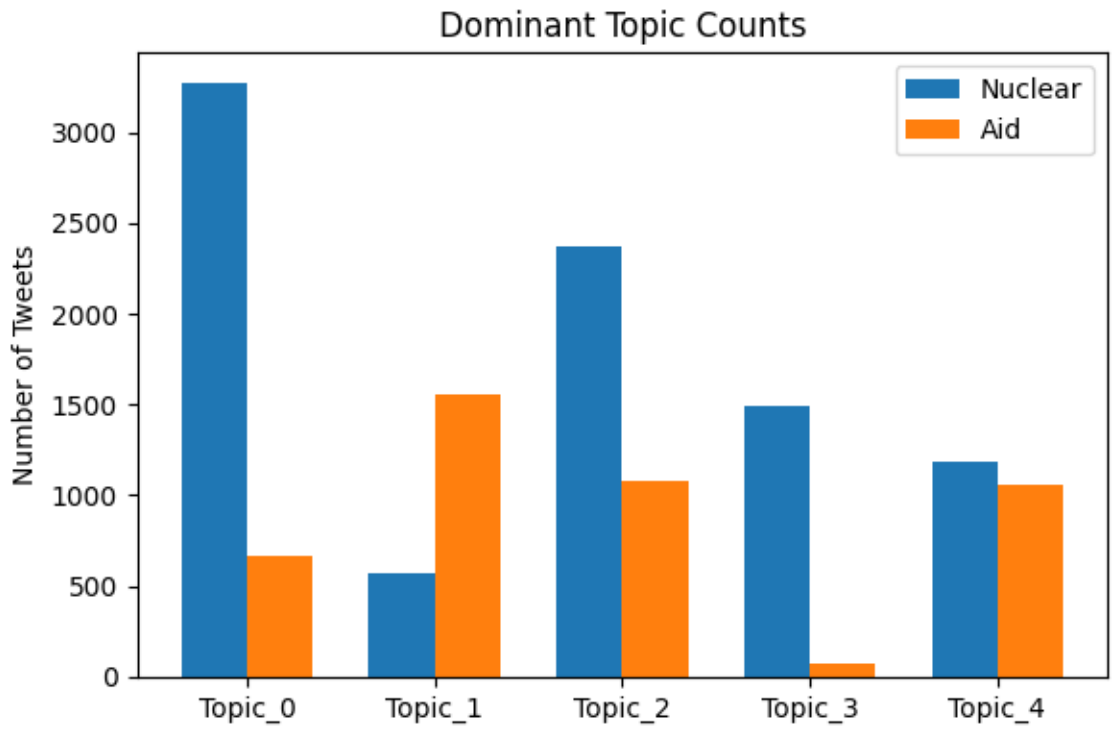

FIGURE 2

(Shows how certain topics dominate the nuclear subset, while others are more common in the aid subset.)

Examining topic probabilities showed a similar pattern. Some topics leaned heavily nuclear, others leaned aid, and a few appeared in both but carried different emotional tones depending on context.

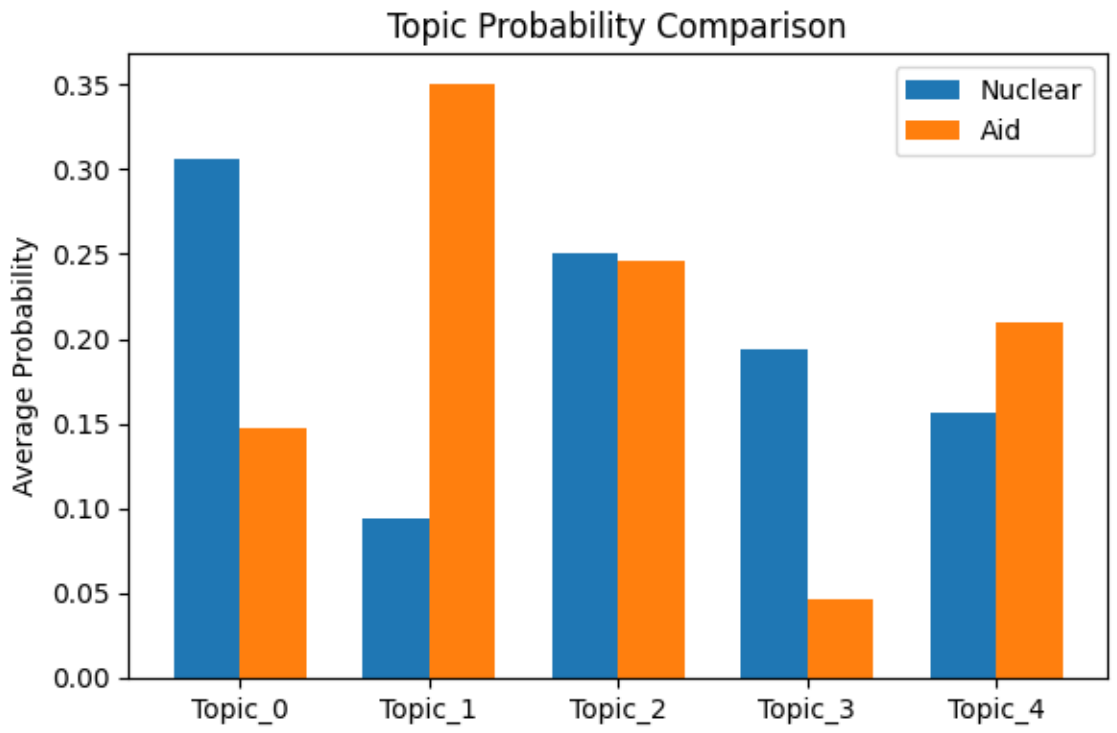

FIGURE 3

(Shows Nuclear discourse gravitates toward threat-based topics, while aid discourse focuses on practical support and cooperation)

Weighted Sentiment by Topic

Even when weighting sentiment by topic probability, nuclear-oriented topics remained negative, confirming that nuclear rhetoric consistently steers sentiment toward fear. Aid-oriented topics stayed near neutral, reinforcing that aid talk is less emotionally volatile.

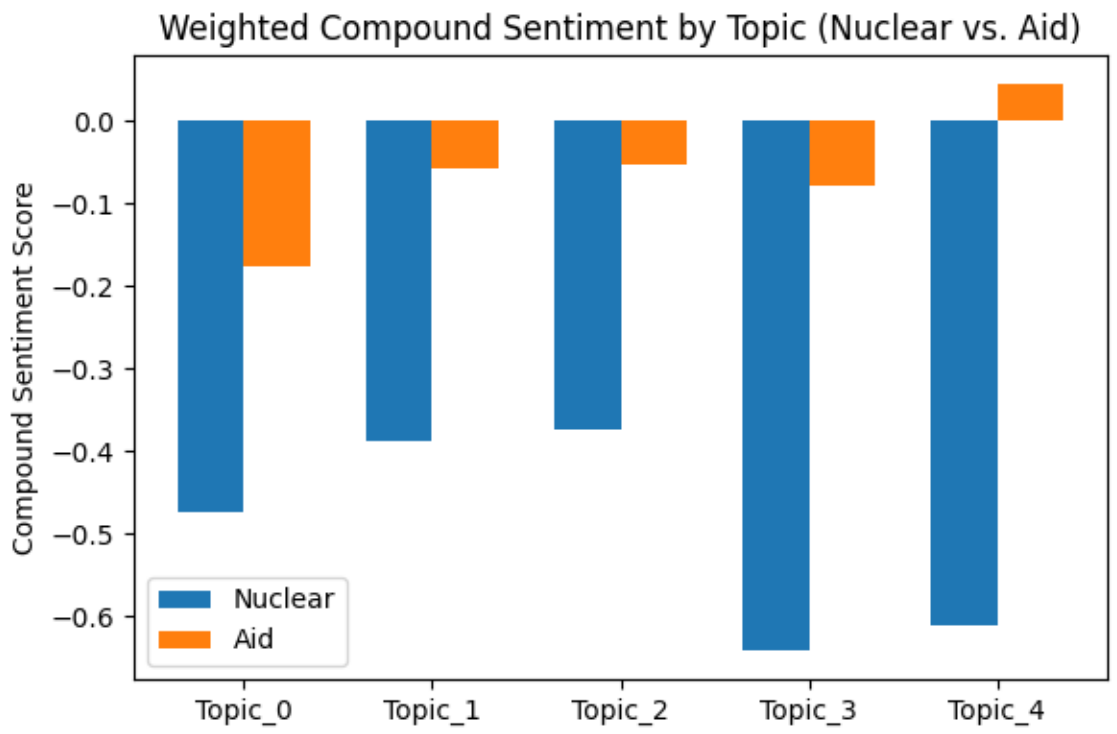

FIGURE 4

(Shows that even when weighted by topic, nuclear-oriented topics remain far more negative than aid-oriented ones.)

Conclusion and Limitations

These findings indicate that nuclear rhetoric in the Russia-Ukraine conflict profoundly influences public discourse, pushing it into a realm of heightened negativity and anxiety. Mentions of nuclear war foster strategic perceptions filled with uncertainty, fear, and the looming threat of catastrophic escalation. In contrast, aid-related discourse offers a steadier emotional baseline, where discussions center on logistical support, defense capabilities, and coalition-building measures rather than impending disaster. This difference suggests that while nuclear narratives frame the conflict as perilously close to something irreversible, aid narratives frame it as a crisis managed through practical interventions.

For policymakers and communicators, the implication is clear: highlighting nuclear capabilities or threats risks inflaming public apprehension, whereas emphasizing aid and support can maintain relative calm in public sentiment. Managing how nuclear and aid messages are delivered might thus shape the broader strategic atmosphere and public confidence.

Limitations include the reliance on keyword-based filtering and a lexicon-based sentiment approach. Some tweets may not neatly fit nuclear or aid categories, and humor, sarcasm, or irony can challenge sentiment accuracy. Also, the dataset consists of English-language tweets, which may not fully represent global sentiment or linguistic diversity. Future studies could incorporate more advanced language models, cover multiple languages, or differentiate between verified leader accounts and general public responses for deeper insight. Additionally, exploring stance detection or event-specific framing techniques could refine understanding of how particular announcements ripple through online discourse over time.

Overall, the evidence indicates that nuclear rhetoric correlates with fear and instability in the public mind, while aid rhetoric correlates with more balanced, constructive perceptions. Understanding this dynamic helps clarify how leaders' words shape the emotional and strategic contours of international conflict as seen through the lens of social media.

References

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Appendix A:

A screenshot of the pyLDAvis visualization (λ=1) for Topic 0 (the nuclear-oriented topic with "nuclearwar," "missiles," "escalation") s included here. This figure helped illuminate how key terms defined the most fear-driven and escalation-focused nuclear discourse encountered

during the analysis.