

Investigating YouTube Narratives and User Resonance in the South China Sea Dispute

Mayor Inna Gurung¹, Ahmed Al-Taweel², and Nitin Agarwal³

COSMOS Research Center, University of Arkansas, Little Rock
{mgurung, asaltaweel, nxagarwal}@ualr.edu

Abstract. YouTube, the leading global video-sharing platform, has been extensively studied to understand user behavior. However, these studies often rely on metadata, which does not accurately reflect the actual video content. Moreover, YouTube titles frequently fail to represent the video content due to sensationalism and platform limitations. To address these issues, we employ a GPT-3-based narrative extraction model to analyze user resonance through video comments. Our study examines 4,225 YouTube videos posted in 2022, focusing on the South China Sea Dispute from the Filipino perspective. We aim to uncover insights into the sentiments, emotions, morality, and toxicity embedded within YouTube content. The findings reveal a prevailing negative sentiment throughout the year, characterized by fear and anger. Notably, we identify narratives highlighting the care and collaborative efforts of NATO countries and allies in supporting Ukraine’s resistance against Russia. In loyalty and betrayal narratives, China and the Philippines emerge as prominent figures, with the Philippines prioritizing diplomatic solutions and China positioning itself as a defender in the Taiwan issue. Furthermore, a dominant focus on harm-related narratives is observed, particularly concerning Russia’s invasion of Ukraine, highlighting aggressive actions and their impact on Ukrainian civilians. These narratives coincide with a surge in toxic content, featuring prominent American political figures such as Joe Biden and Donald Trump. When comparing user narratives and comments, we find that the narratives exhibit higher levels of fear, indicating that the content itself reflects more fear than the comments do. Leveraging the GPT-3 model, our research contributes to a deeper understanding of the narratives surrounding the South China Sea Dispute, shedding light on the interplay between geopolitical events and online content.

Keywords: YouTube · Narrative Analysis · South China Sea Dispute · User Resonance · GPT-3

1 Introduction

YouTube, with 2.68 billion active users and 720 million daily viewing hours, is a key platform for online video consumption [12]. It offers a diverse range of content, from news to entertainment, allowing users to express and propagate

their narratives on various topics [7–9]. However, existing research has mainly focused on metadata rather than the actual content and narratives [10]. This study aims to bridge this gap by analyzing the narratives surrounding the 2022 South China Sea dispute from the Philippines’ perspective, focusing on sentiment, emotion, morality, and toxicity. By examining these elements, we aim to understand the discourse’s quality and its impact on viewers, contributing to our understanding of prevailing attitudes and values on YouTube. This paper is organized as follows: Section 2 reviews relevant literature, Section 3 explains the methodology, Section 4 presents research findings, and Section 5 concludes with limitations and future research directions.

2 Related Work

This section provides a review of literature on narrative analysis, considering the limited research in this area and incorporating methodologically relevant approaches. Narratives can be analyzed from various perspectives, including morality, toxicity, sentiment, emotion, plot, and story accomplishment. Initially, computational linguistics focused on shorter texts like fables and folk stories but has shifted to analyzing full-length novels and movie scripts.

Several studies have used sentiment analysis for narrative analysis. Alm et al. [3] used machine learning for multiclass classification of sentences to identify emotional content. Piper and So [4] employed a sentiment lexicon to assess sentiment distribution in novels.

Emotional analysis in narratives has also been explored. Brahman and Chaturvedi [5] studied the emotional trajectory of protagonists in story generation. Somasundaran et al. [6] analyzed emotion arcs in student narratives based on event affect and implied sentiments.

The Extended Moral Foundations Dictionary (eMFD) [16] is a context-sensitive approach to moral analysis, utilizing crowd-sourced intuitive moral judgments. It has been applied to various fields and social media platforms, such as analyzing moral values in COVID-19 vaccine messages on Facebook [18]. In our study, we use eMFD to understand the moral dimensions in narratives about the South China Sea dispute.

3 Methodology

3.1 Data Collection

We collected 4,225 YouTube videos published in 2022, focusing on the South China Sea dispute from the Philippines’ perspective. These videos were gathered using specific keywords selected by subject matter experts, including "Security," "Chinese militia," "U.S. interference," "Philippine Coast Guard," "Philippine Navy," "People’s Liberation Army," and "Chinese Coast Guard/CCG."

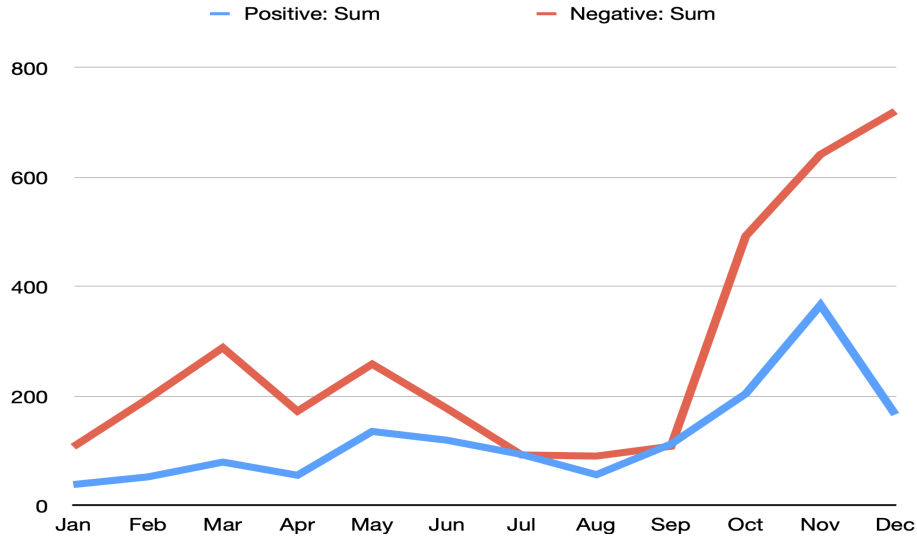


Fig. 1. The line graph demonstrates positive and negative trend over the course of 2022.

3.2 Narrative Extraction

Narratives were extracted from YouTube video transcriptions. We used a methodology based on the approach outlined in reference [15], utilizing GPT-3. During extraction, we employed various parameters defined by GPT-3, specifically using the text-DaVinci-003 engine. To ensure factual responses, we set the temperature value to 0. The max tokens parameter was set to 30, resulting in responses of 2 to 3 sentences. Each video's title, description, and transcript were considered, resulting in 23,700 narratives. These narratives were then analyzed to gain deeper insights into their content.

3.3 Sentiment Analysis

For sentiment analysis in this study, we utilized the Twitter-roBERTa-base model to analyze the narratives collected regarding the South China Sea dispute. To conduct the analysis, we tokenized the narratives and input them into the pre-trained Twitter-roBERTa-base model. The model then assigned sentiment scores to each narrative, indicating the level of positivity or negativity. The findings are presented in Figure 1, which shows the trends of positivity and negativity over each month of 2022.

3.4 Emotion Analysis

In this study, we utilized a fine-tuned version of transfer learning [13], specifically the Emotion-English-DistilRoberta-base model [14], to ensure the accuracy and

reliability of our findings. This model, specifically designed for Natural Language Processing (NLP) tasks, allowed us to extract emotions from the narratives surrounding the dispute. We focused on six emotion categories, namely joy, anger, disgust, fear, sadness, and surprise. The application of transfer learning techniques enhanced the efficiency and precision of the model training process by leveraging knowledge from prior models. The result of the analysis is illustrated in Figure 2, demonstrating trends in each of the categories by month.

3.5 Morality Assessment

To assess morality, we utilized the extended Moral Foundations Dictionary (eMFD), a dictionary-based tool that extracts moral content from textual corpora that can be referred in <https://github.com/medianeuroscience/emfd>). This tool was developed using annotations generated by a large sample of human coders. Our assessment included the Morality Virtue Assessment, which analyzed the distribution of moral virtues (care, fairness, loyalty, authority, and sanctity), and the Morality Vice Assessment, which examined the distribution of moral vices (harm, cheating, betrayal, subversion, and degradation) within YouTube videos pertaining to the South China dispute. The results of the assessment are presented in a grouped bar chart in Figure 4, showcasing the differences in narratives across each moral category.

3.6 Toxicity Analysis

To analyze toxicity, we utilized Detoxify, a Convolutional Neural Network model developed by Unitary AI [15]. This model is trained using word vector inputs to assess whether a given text may be perceived as toxic in a discussion. The Detoxify API provides a probability score ranging from 0 to 1, where a higher value indicates a greater likelihood of the text being labeled as toxic. A toxicity score of 0.5 or higher signifies that the text is labeled as toxic. The result of the analysis is shown in Figure 5 highlighting trends of highly toxic content.

4 Results

4.1 Sentiment Analysis on Narrative

During September to December, negative sentiments surged due to the Russia-Ukraine conflict, concerns about the Biden administration’s National Security Strategy, and worries about inflation. These issues led to unease globally. The Russia-Ukraine conflict raised concerns about regional instability and humanitarian crises. Differing opinions on the Biden administration’s strategy also shaped negative sentiments. Additionally, concerns about inflation’s impact on the economy and personal finances added to the prevailing negativity. This peaked in December, leading to discussions on alternative solutions and legislative changes. Taliban attacks and the erosion of women’s educational rights

in December intensified negative sentiments. Conversely, from August to November, there was a steady increase in positive sentiments, driven by China's economic growth and efforts to maintain balanced relationships, notably with the Philippines. In narratives related to the South China Sea, negative sentiments focused on China's militarization, territorial claims, and regional tensions. Concerns included neighboring countries' worries, failed negotiations, adherence to international law, resource disputes, the U.S. role, ASEAN involvement, and the need for de-escalation. Positive narratives proposed resolutions, suggested partnerships, and emphasized maritime security and cooperation in the region.

4.2 Emotion Analysis on Narrative

In February, emotion analysis of YouTube videos revealed a strong presence of fear, overshadowing other emotions (Figure 2). This fear stemmed from incidents such as artillery fire targeting a kindergarten, attributed to Russian-backed separatists. Discussions about potential chemical weapon use as a pretext for war added to the apprehension. Despite facing unacceptable demands, the United States and its allies worked to prevent armed conflict. However, the trending of World War III jokes and memes on social media highlighted the seriousness of the situation. The narrative conveyed a somber tone, with sadness over potential conflicts and their impact. This analysis underscores the fear and apprehension surrounding the possibility of war and escalating tensions involving Ukraine, Russia, and other nations. In contrast, relations between China and South Africa have flourished in trade, infrastructure, and people-to-people ties over time. This strong bond is evident in thriving markets, remarkable infrastructure development, and vibrant people-to-people connections. In June, this partnership's positive narrative further blossomed. Overall, our emotion analysis indicates a predominantly negative trend throughout most of 2022, with occasional small fluctuations towards positivity.

4.3 Comparing Emotion Analysis in YouTube Narratives and Comments

Emotional trends in the datasets reveal the narratives surrounding the dispute. The narrative dataset shows emotional stability throughout the year, with 'fear' consistently higher, likely reflecting the content's nature. In contrast, the comments dataset, reflecting viewers' reactions, shows broader emotional fluctuations. 'Disgust' peaks in July, while 'surprise' peaks in August. 'Joy' remains consistent and substantial in both datasets, suggesting persistent positive sentiment among viewers. These observations indicate that audience reactions in comments are more diverse and responsive to the content, leading to more pronounced emotional variations. Visualizing these trends through box plots clarifies how emotions evolve on YouTube throughout the year. An analyst would draw several key insights from the emotional trends in the YouTube datasets surrounding the dispute. Overall, the insights help the analyst understand how

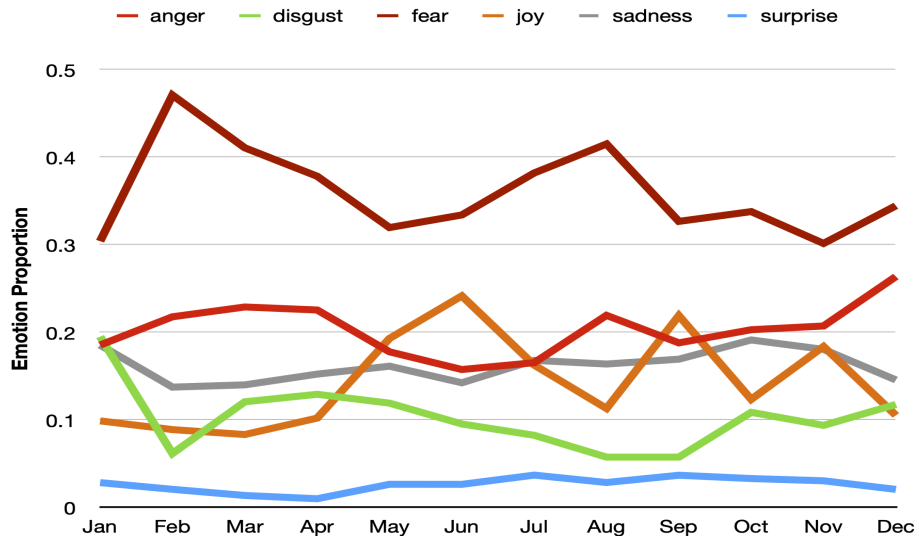


Fig. 2. The line graph demonstrates trends in different emotion categories over the course of the year 2022.

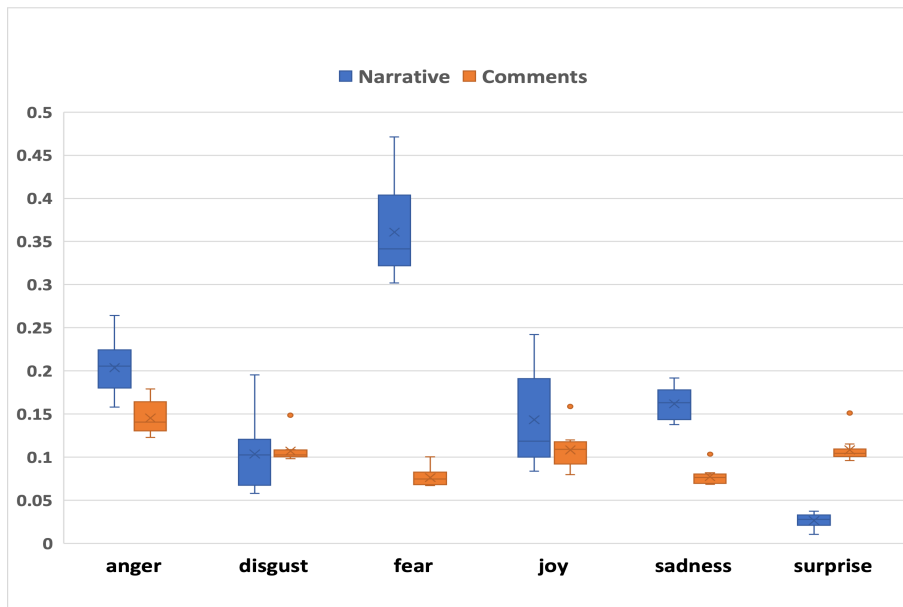


Fig. 3. Exploring Emotion Categories: An Analysis of Narrative vs. Comments in 2022.

emotions evolve in viewer narratives and reactions on YouTube throughout the year. (Figure 3).

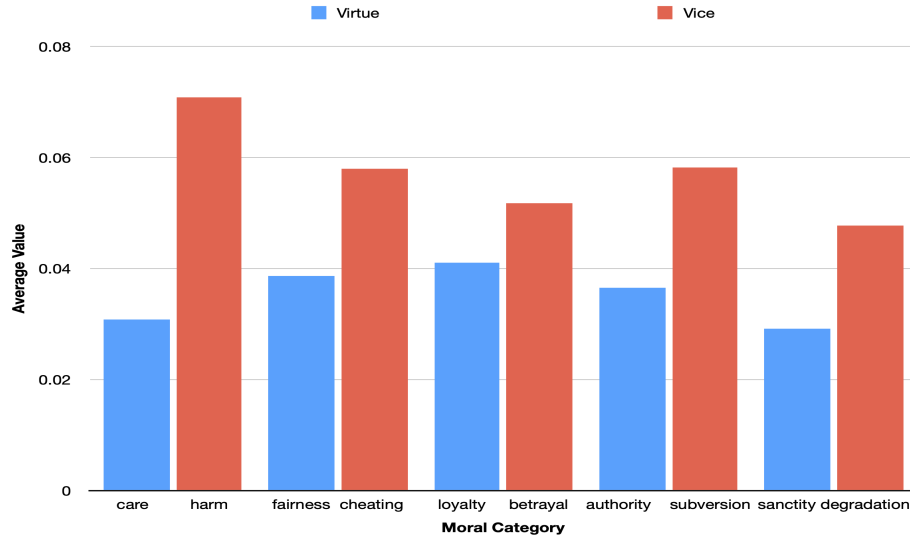


Fig. 4. The grouped bar chart presents a comparison of moral foundations in the narratives surrounding the South China Sea in the year 2022.

4.4 Morality Assessment in Narrative

The dataset reveals a significant observation regarding the prevalence of moral themes in narratives about the South China Sea Dispute in 2022 (Fig. 4). There is a notable contrast between the moral foundations of care and harm. The top narratives for both were extracted from their own distinct videos, except for one video that contained two care narratives. These narratives mainly focused on Russia’s invasion of Ukraine. The surge in harm narratives, starting in September and peaking in December, is particularly noteworthy. These narratives centered on Russia’s bombing of civil infrastructure in Ukraine, aiming to deprive Ukrainians of essential resources like heat and light during the colder months. This aggressive action added pressure on civilians already affected by the conflict, eliciting feelings of empathy and highlighting the need for support.

In contrast, care narratives highlighted the collaborative efforts of NATO countries and allies in supporting Ukraine’s resistance against Russia’s aggression. These accounts showcased the cooperative measures taken by international actors to provide crucial assistance and aid to Ukraine in its ongoing struggle against Russian forces. In the analysis, China and the Philippines stand out across moral foundations, especially in the loyalty/betrayal category. Narratives surrounding the dispute highlight the Philippines’ diplomatic approach, emphasizing its commitment to resolving issues peacefully. These narratives also acknowledge the countries’ diplomatic history, noting improvements under the new Philippine President. Conversely, China is often depicted as aggressive, accused of bullying and debt trap diplomacy. These narratives express concerns about China’s actions and their impact on global relations. Despite diplomatic efforts,

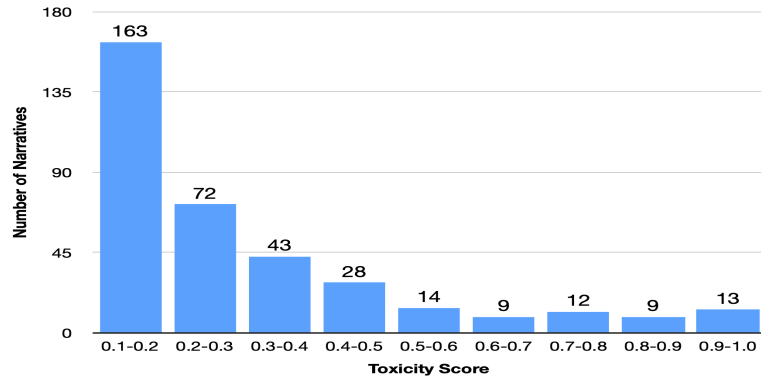


Fig. 5. Frequency of narratives categorized by their toxicity scores in YouTube videos related to the South China Sea dispute.

some narratives question China's intentions and criticize its perceived aggressive behavior. China's response frames the United States as the aggressor, asserting its commitment to defending Taiwan. This counter-narrative portrays China as a protector rather than an aggressor, challenging accusations and positioning its actions as in Taiwan's best interest.

4.5 Toxicity Analysis

To depict toxicity distribution, we constructed a histogram (Fig 5) showing the frequency of toxicity scores between 0.1 and 1. Scores of 0.9-1.0 were most prevalent, comprising 163 instances (45%), while scores of 0.6-0.7 and 0.8-0.9 had the lowest frequency of 9 instances (2). Focusing on narratives with scores above 0.5 for a deeper exploration, An unexpected surge in toxicity unrelated to the South China Sea Dispute occurred in August, possibly due to discussions about Nancy Pelosi's re-election. However, this event did not significantly impact other narratives in 2022. This rise in toxicity was particularly evident in a YouTube video titled "Speaker Pelosi's Reelection Up for Grabs," published by David Feldman in August 2022. Another notable observation in April was a significant increase in toxicity related to discussions about Starbucks CEO Howard Schultz allegedly undermining his own company. This event was the only occurrence related to Schultz in 2022.

5 Conclusion and Future Work

This study aimed to analyze embedded narratives within YouTube videos, focusing on those surrounding the 2022 South China dispute. By examining sentiment, emotion, morality, and toxicity, it sought to understand these narratives and evaluate discourse quality. The analysis revealed patterns and contrasts in

moral foundations. Narratives emphasizing harm surged, particularly related to Russia’s bombing in Ukraine, evoking empathy and emphasizing the need for support. Conversely, narratives of care highlighted collaborative efforts to support Ukraine against Russian aggression, reflecting loyalty and cooperation among international actors. Sentiment and emotion analysis provided insights into prevailing attitudes and emotional impacts. Morality assessment examined the distribution of virtues and vices, offering a deeper understanding of ethical considerations. The toxicity analysis aimed to identify hate speech and assess discourse quality, revealing insights into toxic elements within the narratives and their potential impact. However, potential sampling bias in video selection methodology should be considered, as findings may not be representative of the broader narrative landscape. Future research could expand the analysis to a larger dataset and consider factors like geographical perspectives and viewer demographics. Exploring YouTube’s recommendation algorithms’ role could provide insights into narrative dissemination dynamics.

In conclusion, this study contributes to understanding the narrative landscape surrounding the South China dispute on YouTube, highlighting attitudes, values, and influences. The comprehensive analysis paves the way for further research and informs efforts to foster constructive online discourse.

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