



# NATURAL LANGUAGE PROCESSING EMPLOYING SENTIMENT ANALYSIS ON THE PUBLIC VOICE OF FILIPINOS DURING CRISIS SITUATIONS

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## ABSTRACT

**Aims:** This Natural Language Processing study examined the sentiments of Filipinos in crisis situations using Twitter data. The goal was to identify the prevalent emotional tone, categorize sentiments, and explore variations across different types of crises.

**Study design:** Qualitative Research using Natural Language Processing

**Place and Duration of Study:** Philippines, 2019 - 2023

**Methodology:** There were 10,000 tweets that narrate the public voice of Filipinos during crisis situations that were analyzed using sentiment analysis. They were mined using Apify Easy Twitter Search Scraper. Results were analyzed using Orange Software and Plutchik's Emotional Wheel via Box Plot.

**Results:** Results show that the dominant public voice is neutral, this is followed by positive and negative tones. This means that Filipinos mainly share information, describe their situations, and seek clarifications during crises. It is further revealed that joy was the most dominant emotion, followed by sadness, trust, surprise, fear, disgust, anticipation, and anger. This means that even in crisis, Filipinos wish people's safety, pray for the situation and give jokes to lighten the mood. The order of dominant emotions or tone for earthquake, inflation, and typhoon followed a pattern of neutral, positive and negative. The pandemic stood out, featuring a dominant neutral tone, followed by negative and then positive.

**Conclusion:** These Findings Offer Valuable Insights for Refining Government Crisis Response Strategies. Additionally, This Underscores the Significance Of Recognizing And Understanding Emotions In Communication, Providing Valuable Guidance For Educators And Students.

**KEYWORDS:** Education, applied linguistics, natural language processing, sentiment analysis, public voice, emotional tone, Philippines

## 1. INTRODUCTION

Public voice refers to the expressions of emotions and concerns conveyed by the people. This is posted on social media when natural disasters, geopolitical conflicts and inflation occur [1], [2], [3]. This type of posts narrates people's sentiments [4] and asks for government's response [5]. While it is helpful in crisis management, studies revealed that most sentiments convey negative emotions [6], [7] and some spread misinformation [8], [9] exacerbating societal polarization [10], [11]. Hence, the need to study on the language used and the emotions they convey so the appropriate crisis response may be done by the government.

Globally, public voice has been used to express sentiments among people in times of crises [12]. However, certain posts have a tendency to be excessively emotional, expressing unfavorable feelings and thoughts. For instance, research of [13] explicated that during the COVID-19 pandemic, social media was used to

disseminate confusion and distrust in the government's response. In Kenya and South Africa, it was found that negative content during the COVID-19 pandemic is more prevalent than that of the positive content; thus, influencing others to have the same sentiment [14], [15]. As such, Weller and Colleoni (2023) concluded that around the world the proportion of negative tweets has increased by 20% in the past five years.

More so, social media has been an important platform for disseminating information during crisis situations in the ASEAN context [16]. However, [17] and [18] observed that online public expressions are occasionally employed to shape the public's viewpoint. As [19] revealed, in Indonesia, the use of emoticons in posts contribute to manipulate public opinion. Certain emoticons are used to express anger and frustrations which are meant to discredit government and authorities. This is similar to what is practiced in Malaysia of which figurative language, like



metaphors, are used to manipulate public opinion on social media during crises [20]. Hence, certain emotive language and icons are used to influence the public's perception.

Further, during a crisis or calamity in the Philippines, social media is a common platform for expressing different sentiments and opinions. One example of this was during the Typhoon Ulysses in November 2020, where trending tweets included phrases like "Nasaan ang pangulo" (Where is the president?). Furthermore, the research carried out by [21] amid the COVID-19 pandemic discovered that social media content was predominantly characterized by expressions of frustration and disappointment. This was frequently conveyed through expressive language and exaggeration, intending to underscore the gravity of the situation. Likewise, during the Taal eruption in 2020, [22] noted that social media posts conveyed a sense of emergency and alarm, utilizing emotive language and hyperbole to highlight the gravity of the situation.

While several public voices available online tend to be too emotional that negatively influence the perception of the people, there are also several posts that aim to tell the true situation of the affected people. Because of that, this study was conducted. Through its result, it would reveal the overall emotion and sentiments of the affected populace. With that, government officials may be able to look into and improve the way they deliver their service in times of crises.

This study particularly explored on the language used in expressing the public voice of the people through Natural Language Processing (NLP) using Sentiment Analysis (SA). NLP was used to scrutinize the sentiments of social media users as this works best in analyzing and disseminating a wide range of information of natural language that is difficult for humans to do [23] Further, SA was the technique employed to examine the text mined from a variety of sources like social media platforms, chatbot, conversations, blog posts, and email [24]. Hence, the plethora of public voice of the people during crisis situations was examined so the real emotion and message was revealed.

This study provided data for the readers on the dominant sentiment of the people concerning the government's response during crisis situations. As such, it filled the data gap because the researcher had not encountered any study conducted using NLP and SE analyzing the public voice of the Filipinos in times of crisis being contextualized in the field of linguistics. More so, this study filled the practical gap as this provides new information that is relevant to government's crisis management and response. The result is meant to be disseminated by presenting it through research forum and by publishing it on a reputable or refereed journal so that the public will see the importance of expressing their public voice and the government will improve their delivery of service.

## 2. RESEARCH GOALS AND OBJECTIVES

This study employed Natural Language Processing in the parlance of Sentiment Analysis to document and analyze the public voice of the Filipinos posted on social media during crisis situations. It aimed to determine the emotions conveyed by these sentiments. Specifically, it sought to answer the following questions: What is the dominant public voice of the Filipinos during crisis situations? What are the types of emotional tone of the public voice of Filipinos during crisis situations? How do these sentiments vary across different types of crisis situations experienced by Filipinos?

## 3. METHODOLOGY

### 3.1 Research Design

This research used Natural Language Processing (NLP) approach employing the techniques of Sentiment Analysis. NLP is considered as suitable approach since the primary goal of this research was to analyze the tweets of Filipinos in the occurrence of four types of crisis situations. The data subjected to analysis in this study covered a large number of tweets. Further, sentiment analysis was the appropriate method used since the objective was to discover the underlying emotions of Filipinos on the Filipinos' public voice. This approach was employed to determine the dominant emotional tone and the variation of these emotions across different types of crisis situations.

### 3.2. Research Material

The research material of this study were tweets of Filipinos in times of crisis situation particularly during typhoon, earthquake, increase of prices of commodities and pandemic. Tweets were the sole materials of this study as this document the public voice of the entire populace since in this platform a topic that hypes in a particular situation trend and become a most talked about discussion in that particular event.

### 3.3. Data Collection

In conducting this study, the researcher maintained ethicality and trustworthiness to safeguard the involved organizations' safety and welfare during data gathering. Before conducting the study, he secured letter of implementation from the Research Ethics Committee (REC) and an endorsement letter to conduct the study from the University of the Immaculate Conception Graduate School's Dean. After he received a go signal to conduct his study, collection of research materials commenced. Then, he scheduled a meeting with his adviser to seek advice on the processes to take in conducting the study, which helped me develop a detailed plan. When permission was granted, the public voice of Filipinos during crisis situations were collected using Twitter Search Scraper. After which, the data were placed in a database. Then, they were carefully read to determine if they relate to the study or not. When data cleaning was done, the datasets were run in Orange Software to analyze the dominant type of public voice and the varying types of emotion conveyed across different crisis situations.



### 3.4. Data Analysis

To assist in answering the research questions in the study, several steps were followed using Orange Free Software. The following were followed based from [25]: Data Collection, Data Preprocessing, Text Mining, Feature Selection, Data Visualization, Modeling and Analysis, and Evaluation and Interpretation.

## 4. RESULTS AND DISCUSSION

### 4.1. Dominant Public Voice of Filipinos during Crisis Situations

The dominant public voice of the Filipinos in times of crisis situations is neutral with a number of tweets of 7,646 having an equivalent percentage of 76.48. This is followed with positive voice with 1,491 number of tweets having an equivalent percentage of 14.91% and the last one is negative voice with 862 number of tweets with an equivalent percentage of 8.62%.

The data signifies that despite the calamities and difficulties experienced by the Filipinos during crisis situations, they remained to have neutral sentiments. Thus, the tweets during crisis situations are more of stating their observation, asking questions, and narrating their experience. The dominant type of tweets of Filipinos in times of crisis situations provide factual information or descriptions, express neutral opinions or assessments, and avoid emotional language. This is exemplified by TT 40 when it focuses on recounting events and actions rather than expressing personal feelings or opinions further supports its neutral tone, making it a straightforward and informative communication about the community's resilience during a challenging situation.

The next type of public voice of Filipinos that dominate during crisis situations is positive. It can be noted that despite the calamities or the misfortune that they experience, they remain to have positive outlook in life. They wish for the safety of everyone and use positive language and words. Their tweets are expressing hope and trust in the midst of crisis situations. This is conveyed by PT 108 as the author expresses hope that officials are actively working to prevent the entry of the virus into the country. The

concern for the well-being of the Philippines and its people, particularly the poorest of the poor, conveys a sense of empathy and a desire for a positive outcome.

The last dominant public voice conveyed by Filipinos in times of crises is negative. As indicated, only 8.62% of the tweets contain negative emotions which convey anger, fear, frustration and sadness out from the crises transpiring. This is illustrated by PT 105 as its overall tone is marked by pessimism and frustration, emphasizing a grim outlook on the current state of affairs in relation to COVID-19 in the country.

The result of this study is congruent to the findings of [26] and [27] when they examined posts during the COVID-19 pandemic. It was revealed that during this crisis situation, people convey neutral tone as they are more of sharing news articles and government announcements. Also, some other posts are more of expressing support and advice on how to stay safe. Similarly, the findings of this study support to that of [28]. They found that the overall emotional atmosphere of short video comments on the Zhengzhou flood was neutral, with 39.2% of comments expressing neutral emotions. It was further found that these comments expressing neutral emotions relay information and experience which do not intend to criticize nor appreciate government or any entity.

More so, this study backed up the result of those [29] when they explicated that in the occurrence of earthquake, communication channels like social media play a great role in dissemination of information. The affected communities rely on public channels as social media, emergency hotline, and community radio to voice their immediate needs for food, water, shelter, and medical assistance. Since this study revealed that the most dominant tone among the sentiments of Filipinos is neutral, it can be surmised that it affirms to what [30] and [31] discovered. They expounded that neutral tone would emerge on the expressions of sentiments among Filipinos during crisis situations. Filipinos tend to avoid expressing strong emotions in both face-to-face and online interactions even in times of crisis. They do this in order to maintain politeness and to avoid conflict.

**Table 1. Dominant Public Voice of Filipinos during Crisis Situations**

Type of Public Voice	Number of Tweets	Sample Tweets
Neutral	7,646	<i>I think not all, I'm from Philippines also in western Visayas. Here in our city, we work as one, we helped each other even though we don't recognize each other. I can prove it when our city hit by Bagyong Odette, and don't have any signals, we stayed in our city ground as one. (TT 40)</i>
Positive	1,491	<i>Thank God, we are still currently safe, but I hope the officials are doing their thing to prevent the virus from entering the country because the Philippines cannot afford to go through another round of a pandemic with the problems that we're currently facing, especially for the poorest of the poor. (PT 108)</i>
Negative	862	<i>The Philippines about to get fucked real hard by COVID-19. The lockdown is useless. (PT1051)</i>
<b>Total number of Tweets</b>	<b>10,000</b>	



#### 4.2. Types of Emotional Tone of the Public Voice of Filipinos during Crisis Situations

Utilizing Pluchik's [32] Wheel of Emotion further determine the emotional tone of public voice of Filipinos during crisis situations. The data were categorized using the Box Plot of Orange Software. This was done to classify the words used in the tweets and to identify where do they belong according to the eight emotions; namely, anger, disgust, fear, joy, sadness, surprise, trust, and anticipation.

From among the emotions mentioned, it was revealed that joy has the highest number. It is comprised of 3,861 number of tweets. This is followed by sadness with 3,522. Then, trust is the third accounting to 1,434. The fourth is surprise which has 759 number of tweets. The fifth one is fear with 356 number of tweets. The sixth one is disgust with 144 number of tweets. Then it is followed with anticipation as the seventh with 67 number of tweets and lastly anger with 35 number of tweets.

The sample tweet in table 2 signifies that despite the unfortunate situations that Filipinos are into, they are still able to convey joy in their public voice. Joy is expressed when the statements describe feeling of pleasure and happiness. This can be manifested by talking about positive feeling or experience, describing positive outcomes or achievements and using terms like happy, delighted and/or elated. It was revealed that there are 3,681 tweets or 36.81% of those that belong to the mentioned emotional tone. The types of public voice categorized under this emotional tone includes employment of humor, giving complement, sharing information and saying a prayer. PT193 is categorized to convey the emotional tone of joy as it expresses appreciation to the Filipinos who have exerted so much effort and are considered heroes in times of pandemic.

The next type of emotional tone that is expressed in the public voice of the Filipinos in times of crisis situations is sadness. This emotion expresses a feeling of sorrow or unhappiness caused by loss or misfortune. This is conveyed in a sense of melancholy or despair, use of words like sad, depressed, unhappy, or down, and describe loss, disappointment, or failure. It has 3,522 tweets which is equivalent to 35.22%. This means that as dominantly Filipinos remained to be optimistic in times of crisis, there are also people who are experiencing negative emotions. This is illustrated by ET 1920 as the tweet exudes a profound sense of sadness, as it is evident through the vivid depiction of the devastating aftermath of the strong earthquakes in Mindanao.

The third dominant emotional tone on the public voice of the Filipinos in terms of crisis situations is trust. This emotion garnered 1,434 tweets or 14.34%. This positive tone is conveyed by Filipinos by professing their faith to the Almighty through prayer or by expressing their full confidence to their government's response of the crisis situation. The tweet reflects a deep-seated reliance on the President of the country, expressing unwavering confidence in the

leader's commitment to uplift the economy and improve the lives of the people, even in the face of challenges such as inflation. The use of words like "trust," "support," and the concluding phrase "long live" underscores the poser's firm belief in the government's capability to address the ongoing crisis.

The fourth emotional tone conveyed in the public voice of Filipinos during crisis situations is surprise. Surprise is a feeling of astonishment or wonder caused by something unexpected. This is done by expressing unexpectedness, using words like surprised, amazed, shocked, or astonished, and describing unexpected events or outcomes. It has garnered 759 tweets or 7.59%. Although this emotional tone is not that big in percentage however several public voices convey this one. This emotion is conveyed as the people have the hard time believing to how the government handles the situation or how severe the crisis is.

The fifth emotional tone conveyed in the public voice of the Filipinos in times of crisis situations is fear. This refers to a feeling of anxiety or apprehension caused by a perceived threat or danger. This is done by conveying a sense of apprehension or worry, using words like afraid, scared, anxious, or nervous, and describing potential harm or danger. It has accumulated 356 tweets or only 3.56%. This emotional tone is conveyed when Filipinos express their doubt or uncertainty of their safety. Most of the tweets that qualify in this category express their worry about their life, especially in times of natural disasters.

The sixth emotional tone that was expressed in the public voice of the Filipinos during crisis situations is disgust. This emotional tone accounts to only 144 tweets or 1.44%. Although a few in quantity, but this emotional tone needs to be considered as this conveys the people's frustration on how the government responded to the crisis situations. The emotional tone of disgust is present in PT 169 due to the expressed sentiment towards political figures and their perceived role in managing the COVID-19 crisis. The use of the term "quickest solution" suggests a frustration or dissatisfaction with the current leadership's handling of the pandemic.

The seventh emotional tone that is conveyed in the public voice of the Filipinos in times of crisis situations is anticipation. There are 67 tweets that qualified to this category. This means it is only 0.67%. This kind of emotional tone is expressed when something is expected to happen or when eagerness is conveyed by the statements. It might be positive or negative, depending on how they see the government's response in regard to the crisis being faced. The emotional tone of anticipation is evident in PT 65 as it expressed concern and hope regarding the new variant of COVID-19. The overall tone of the tweet reflects a mix of caution and hopeful anticipation, as the author anticipates and expresses concern about the potential impact of the new variant on an already challenging scenario.



The eighth and last emotional tone present in the public voice of Filipinos during crisis situations is anger. It has garnered only 35 number of tweets among 10,000 being subjected in this study. This means that there is only 0.35% that accounts to this emotional tone. This type of emotion has been conveyed to express their anger to the government. It expresses their dissatisfaction on the way the crisis is being handled. PT 336 exemplifies this as it primarily directed towards the people in the Philippines and their perceived frustration or dissatisfaction with President Duterte. It conveys a tone of anger by linking negative health outcomes not to the virus itself, but to the perceived shortcomings of the political leadership, particularly Duterte.

The result of this study is congruent to the findings of [33]. They conducted a sentiment analysis on the posts of people on social media worldwide about the outbreak of COVID-19. It was revealed that despite the horror of the pandemic, positive sentiments were dominantly conveyed by their tweets. It was explicated that despite the stressed brought by lockdowns, the people appreciated the efforts of their respective government, frontline and health workers and police officers in doing their best to contain the virus.

More so, other studies support the findings of this research, as they explicated that other emotional tones too are prevalent in times of crisis situations. For instance, during the Berlin Christmas market attack in 2016, sadness and anger were the prevailing emotions felt by the people [34]. They had become emotionally sensitive because of that crisis situation. On the other hand, during the Marawi Siege in the Philippines, [35] found that despite the crisis, many social media posts expressed positive emotions such as hope, resilience, and trust. Hence, they concluded that by doing this, Filipinos are able to maintain a positive outlook even in the face of adversity.

Further, [36] examined Twitter usage during Hurricane Harvey. It was found that surprise was a common emotion expressed in tweets about the disaster. Users were surprised by the government's slow and inadequate response to the storm, as well as by the lack of communication from officials. [37] conducted a survey to investigate the relationship between social media use and emotional reactions to earthquakes. It was found that fear and worry are the ones that prevail among the posts of the people. This emotional reaction is the same with what the people in Mexico felt during series of tremors experienced in their place. [38] revealed that during the tremors the people was overwhelmed with fear and anxiety.

Moreover, a negative emotion was uncovered as [39] examined the opinions on Facebook during a period of inflation in 2022-2023. The findings revealed a range of sentiments, including frustration, disgust, and discussions about the impact of inflation on various aspects of life. In another study, [40] examined the emotional tone of Twitter posts over time during the COVID-19 pandemic. The study found that people's emotions were dynamic and fluctuated throughout the pandemic. One of the emotions that are also common to these tweets are the positive emotions, such as anticipation and gratitude, were expressed throughout the pandemic.

Lastly, [41] analyzed the use of Twitter to express anger during the COVID-19 pandemic in the United Kingdom from March to May 2020. The findings showed that Twitter was a platform for expressing anger, particularly in the early stages of the pandemic. This anger was expressed in the form of criticism towards the government, frustration over the lack of information, and fear for the future.

Table 2: Types of Emotional Tone of the Public Voice of Filipinos during Crisis Situations

Emotional Tone	Number of Tweets	Sample Tweet
Joy	3,681	<i>Happy National Heroes Day to all who dream and work for a better Philippines! Long live your heroism, especially in the midst of the pandemic! (PT 193)</i>
Sadness	3,522	<i>My town is one of the most affected towns of the strong earthquakes in Mindanao. No water, no electricity, stores are closed, buildings collapsed, families lost their homes, landslides here and there. Please send help for my beloved, Makilala. (ET 1920)</i>
Trust	1,434	<i>We have trust and support for your endeavors, and we believe that your attendance at the Economic forum will provide new opportunities for the development of our country and the benefit of every Filipino. Thank you, beloved President. Long live! (IT 557)</i>
Surprise	759	<i>Wow... it's been over a year since Typhoon Odette, but we haven't seen a single cent from the promised assistance. They say others have received aid, but many of us still haven't. It seems even disasters are being politicized. It's really 'more fun' in the Philippines. (TT 39)</i>
Fear	356	<i>I am still in the office when I felt the magnitude 6.0 and still scared for an aftershock now. My hands are still trembling now with fear while making this tweet. Please pray with us! Pray for Philippines! (ET 956)</i>



Disgust	144	<b>Duterte and Go are the quickest solution against COVID-19. I'm sure that if they resign along with their appointees in 3 to 6 months, the Philippines will win against the CCP virus (COVID-19). (PT 169)</b>
Anticipation	67	Be cautious about the new variant of COVID-19. Let's hope it doesn't enter the Philippines; we're already in a tough situation. (PT 65)
Anger	35	People in the Philippines won't die from COVID-19 but from a heart attack due to their anger towards Duterte. (PT 336)
<b>Total number of Tweets</b>	<b>10,000</b>	

### 4.3. Variation of Sentiments across Different Types of Crisis Situations

As presented in Table 3, there is a variation with regard to the sentiments of the Filipinos in crisis situations. For earthquake, inflation, and typhoon, it can be noted that the dominant emotional tone is neutral then followed with positive and negative respectively. Also, the dominant sentiment of pandemic is neutral but it is followed with negative emotional tone, then positive. With that, it can be argued that the pandemic has a different

emotional tone compared to earthquake, inflation and typhoon as negative tone is more prevalent than that of the positive one.

As what the table below contains, earthquake has 1,723 tweets or 68.95% of neutral tone and has 597 tweets or 24% of positive tone. This is congruent to the emotional tone of Filipinos in times of inflation as neutral tone has 2,069 tweets or 82.78% and the positive tone is 222 tweets or 8.87%. This is also similar to that of typhoon as neutral tone has 1,855 tweets or 74.20% and positive tone has 442 tweets or 17.68%.

**Table 3: Variation of Sentiments across Different Types of Crisis Situation**

Type of Crisis Situation	Type of Sentiment	Number of Tweets	Percentage	Sample Tweet
Earthquake	Neutral	1,723	68.95%	<i>We pray more people will support our brothers and sisters affected by the earthquakes in Mindanao. (ET 1444)</i>
	Positive	597	24%	
	Negative	179	7.16%	
Inflation	Neutral	2,069	82.78%	<i>Hahaha hope you get onions now that prices have gone down. (IT 514)</i>
	Positive	222	8.87%	
	Negative	209	8.35%	
Typhoon	Neutral	1,855	74.20%	<i>Keep safe, Philippines! Keep safe, Cebu! Let's all stay in our homes to avoid the disasters that Typhoon Odette may bring. God bless us all. (TT 164)</i>
	Positive	442	17.68%	
	Negative	203	8.12%	
Pandemic	Neutral	1,999	79.97%	<i>Only in the Philippines is the Covid-19 swab test paid for because it's a business for some people. (PT 10)</i>
	Negative	271	10.84%	
	Positive	230	9.20%	
<b>Total Number of Tweets</b>		<b>10,000</b>	<b>100%</b>	

To further determine if there exists a variation of sentiments on the public voice of Filipinos across crisis situations, the data that were run from Orange Software were further subjected to additional analysis through ANOVA. It was revealed that the

mean score is 261.882 and the f value is 16928.542 with the p-value of .000. Since this is lower than .05 level of significance, this means that there exists a variation in regard to the sentiments of Filipinos across different types of crisis situations.



**Table 3.1. Significant Difference of Sentiments across Different Types of Crisis Situations**

	Sum of Squares	df	Mean Square	f	Sig.
<b>Between Groups</b>	2880.703	11	261.882	16928.542	.000
<b>Within Groups</b>	463.817	29982	.015		
<b>Total</b>	3344.521	29993			

Furthermore, to confirm the result contained in Table 3.1, the data was subjected to Multiple Comparison using Tukey HSD. In here, the sentiments of the Filipinos in each crisis situation were considered in order to see if there are variations. As can be seen in the data in Table 3.2, the mean difference is shown between each pair of variables, along with a significance code (asterisk) indicating whether the difference is statistically significant at the 0.05 level.

As the table contains, there are a number of statistically significant differences between the variables. For example, the mean score for Earthquake Positive Emotion is significantly higher than the mean score for Earthquake Negative Emotion, Inflation Neutral Emotion, Typhoon Neutral Emotion, and Pandemic Neutral Emotion. Additionally, the mean score for Earthquake Negative Emotion is significantly lower than the mean score for Earthquake Neutral Emotion, Inflation Positive Emotion, Inflation Negative Emotion, Inflation Neutral Emotion, Typhoon Positive Emotion, Typhoon Negative Emotion, Typhoon Neutral Emotion, Pandemic Positive Emotion, Pandemic Negative Emotion, and Pandemic Neutral Emotion.

Positive sentiment appears highest during earthquakes, suggesting a potential sense of community and resilience in the face of natural disasters. Inflation also elicits a relatively positive response, possibly indicating an understanding of its economic implications and potential for adaptation. However, pandemic generates the lowest positive sentiment, likely due to their widespread impact and associated fear and uncertainty.

Negative sentiment peaks during typhoons, reflecting the immediate threat and potential devastation they pose. Earthquakes and pandemics also evoke a significant degree of negativity, while inflation generates the least negative response. This pattern suggests that the perceived level of danger and immediacy plays a crucial role in shaping negative sentiment. Neutral sentiment is most prevalent in the context of inflation, potentially indicating a more balanced perspective on this complex economic issue. Conversely, pandemics trigger the

lowest level of neutral sentiment, highlighting a stark polarization of opinions and lack of consensus around their management. These findings highlight the complex relationship between crisis type and public emotions, offering valuable insights for crisis management and communication strategies.

This result harmonizes with the findings of other studies. For example, the high positive sentiment associated with earthquakes aligns with the concept of communal coping [42]. Earthquakes, despite their potential for destruction, often trigger a sense of shared experience and community. This shared sense of vulnerability can foster feelings of unity and support, leading to a more positive emotional response [43].

The high negative sentiment associated with typhoons is unsurprising, considering their potential for widespread destruction and loss of life. Research [43] found that individuals exposed to typhoons reported significant levels of anxiety, depression, and post-traumatic stress disorder (PTSD). The fear of physical harm, disruption of daily life, and uncertainty surrounding recovery efforts likely contribute to the negative emotions associated with typhoons [44].

The finding that inflation triggers a neutral response is intriguing. Inflation, while impacting individuals financially, may not evoke the same emotional intensity as more immediate and visible threats like natural disasters. Moreover, the abstract nature of inflation, compared to the tangible consequences of a typhoon, may lead to a more muted emotional response [45].

Lastly, the mixed sentiment associated with pandemics reflects the multifaceted nature of these events. While fear and anxiety are prevalent due to the potential for illness and death, positive emotions like gratitude for healthcare workers and community support can also emerge [46]. The specific emotions experienced during a pandemic likely depend on individual vulnerability, perceived risk, and access to resources [47].



**Table 3.2: Variations of Sentiments in Every Crisis Situation**

Multiple Comparisons						
(I) V1	(J) V1	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Earthquake Positive	Earthquake Negative	.167236*	.003519	.000	.15574	.17874
	Earthquake Neutral	-.450655*	.003519	.000	-.46215	-.43915
	Inflation Positive	.150193*	.003519	.000	.13869	.16169
Inflation Negative	Inflation Positive	.155354*	.003519	.000	.14385	.16685
	Inflation Neutral	-.588962*	.003519	.000	-.60046	-.57746
Typhoon Positive	Typhoon Positive	.062016*	.003518	.000	.05052	.07352
	Typhoon Negative	.157686*	.003518	.000	.14619	.16919
Typhoon Neutral	Typhoon Positive	-.503143*	.003518	.000	-.51464	-.49164
	Typhoon Negative	.146893*	.003518	.000	.13539	.15839
Pandemic Positive	Pandemic Positive	.130505*	.003518	.000	.11901	.14200
	Pandemic Negative	-.560816*	.003518	.000	-.57231	-.54932
Pandemic Neutral	Pandemic Positive					
	Pandemic Negative					

#### 4. CONCLUSION

The dominant public voice of Filipinos during crisis situations is neutral. This means that even in times of difficult times, Filipinos tend to avoid being emotional and blame the authority of express negative emotions. Instead, they share valuable information and narratives which may be helpful to their fellows in addressing the mentioned crisis.

When the public voice is further analyzed, it was revealed that among the eight emotional tone, joy was the most commonly expressed emotional tone among Filipinos. This means that even in times of crises Filipinos are able to look for the brighter side of it and are even more appreciative of what has the government done or what has the situation make them realize about life.

Lastly, when the emotions of each crisis situations were compared, it was revealed that they vary according to the kind of crisis they face. Filipinos tend to express optimism and faith in the occurrence of natural disasters; thus, conveying praying and well wishes while during pandemic the people tend to express more negative emotions as they tend to criticize how the government address the situation and how the system fail.

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affectionate parents, Ernesto and Julieta Villazor, my ever supportive adviser, family and friends.

#### COMPETING INTERESTS

The researcher has no competing interest with other people or organization.

#### AUTHORS' CONTRIBUTIONS

The author conducted this study by himself with the guidance of his adviser.

#### CONSENT (WHERE EVER APPLICABLE)

This study does not need to have a consent as this analyzed Tweets which are readily available on social media; hence, is part of the public domain.

#### ETHICAL APPROVAL (WHERE EVER APPLICABLE)

In conducting this study, the researcher secured the Ethical clearance from the university's Research Ethic's Committee.

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