Critical Metadata Analysis and Data Visualization of United States, United Kingdom, and Ireland World Leaders Twitter Responses to COVID-19

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Research Article

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INTRODUCTION

Twitter can be utilized as a tool in Medical Education because it may serve as a learning tool and a mode of sharing critical medical updates and scientific communication. Medical Humanities scholars may utilize the social media site to situate knowledge on the novel COVID-19, also known as coronavirus. Presently, several world leaders utilize Twitter.com to communicate scientific findings as well as their own views of COVID-19. Brandt and Botelho (2020) argue that COVID-19 can be described as the "perfect storm" because of its unpredictability. COVID-19 affected the entire world from its onset in December 2019. COVID-19 has marked itself as an unpredictable virus and was initially difficult to track. Brandt and Botelho (2020) argue that COVID-19 is overly described as unpredictable because of the "rare combination of adverse meteorological factors". Whilst COVID-19 itself as a pandemic is unpredictable, some of the ways that the government is handling the situation was also very unclear. Thus, this research was pursued to follow the government's stance on the development of COVID-19 and the policies and procedures that they would follow and employ to assert control over the situation.

The main terms of my debate discusses how governmental officials discuss and shape the policies for COVID-19. Brand and Botelho (2020) define epidemics as not being "simply natural" (p.1494). Thus, it is important to follow how COVID-19 is explored and how it could alter public health infrastructure as well as challenge particular systems of knowledge. The political landscape for COVID-19 is intimately connected with the government's involvement and the way that they set out the requirements for quarantine and how others are able to engage with society. Rufai and Bunce (2020) conducted a study about world leaders and
Twitter during COVID-19 that highlighted how world leaders with verified Twitter accounts utilized hashtags when discussing COVID-19. Rufai and Bunce (2020) aimed to classify the world leaders’ tweets into categories and decide if their tweets were 'informative', 'political', or 'morale-boosting'.

My research questions discuss how social media plays a role in how the governments from different places discuss COVID-19 as well as how they make policies and communicate them. The argument is also about how those governments make the rules for quarantine. The way that I am approaching the research is to review both the medical and historical context of COVID-19 alongside the social commentary provided by various governmental leaders. The critical context of my discussion will highlight governmental stances in contrast to public opinion. By engaging in COVID-19 research, I hope to discover the governmental responses to COVID-19 and explore the ways that the topic is discussed on a global scale.

This paper will be a comparative analysis of the governments in the United States, the United Kingdom, and Ireland. The data from social media and news organizations may also be compared to data presented by the World Health Organization (WHO) and the Center for Disease Control (CDC). The questions that will allow us to expose or uncover new knowledge in this research are:

1. How do governments use their personal social media platforms, specifically Twitter, to promote their messaging and the perception of the COVID-19 pandemic and highlight key strategies and policy priorities?
2. How does the data presented on social media outlets differ from the data presented by the WHO and the CDC?

This research is important because it situates the information about how the government deals with the pandemic from different areas. Thus, this research seeks to centralize the responses about COVID-19 and help to map out the government response to COVID-19. It is significant that this research be undertaken because the novel COVID-19 is a new element introduced to society and this research would provide an understanding on how to deal with and manage this virus more effectively. The research is necessary because it would allow all of the governments to be on the same page and will uncover the methods that several governments have been dealing with the virus from a governmental stance.

The research will impact our understanding of the topic because knowing how the government deals with an issue will affect how we deal with the public as well as communicate accurate information about COVID-19 and relevant policies and procedures. In my plight to find answers, I will be examining the historical context of COVID-19 such as when it started and the historical context that preceded it. I will also be discussing the policies and procedures that guided lockdown and developments following lockdown. This is important to give context to what happened after the COVID-19 outbreak as well as the current statistics as to whether or not the numbers increased or decreased over time. Twitter.com (Twitter) is a platform that allows for any user to tweet information about a particular topic. The reason that Twitter will be used is because it is an information-sharing platform that users engage with to share and can help to inform others on topics and scopes of different information.
Szomszor et al. (2020) express that “Twitter provides an excellent way to sample large populations” (p. 320). Further, Szomszor (2020) expanded on how “in terms of epidemic intelligence, Twitter can be used to both track [iii] and even predict [iii] the spread of infectious diseases” (p. 320). Moreover, Brandt and Botelho (2020) examine the rates of transmission and mortality rate of COVID-19 and believe that it has, in a sense, gone beyond the control of humans. To examine and collect information about COVID-19, Twitter is helpful to create datasets from users like former United States President Donald Trump, the Prime Minister of the United Kingdom Boris Johnson, and the President of Ireland Michael D. Higgins. The focus of the research is to gain information on these particular users to assess if their policies and plans to deal with COVID-19 are reflected in their tweets.

METHOD

In the methods section, I am going to explore tweets from key accounts of governmental figures Mr Donald Trump, Prime Minister Johnson, and President Higgins. I am examining these figures' Twitter accounts to gain information from their personal accounts. I hope to explore their accounts to see if their personal ideas of tweets discuss the governmental response of how they are dealing with COVID-19.

First, I analyzed the data from the dataset, which is the users’ tweets. I examined each of the tweets to explore what each user is saying after which I compared the tweets in a close reading. The timeframe that I focused on to develop my research scope was from December 30, 2019 to May 30, 2020.
I created a spreadsheet that had the following elements:

- Name
- Username
- Tweet URL
- Tweet Posted Time
- Tweet Posted Date
- Tweet Content
- Tweet Type
- Method of Tweeting
- Retweets Received per Tweet
- Likes Received per Tweet
- Profile URL

Following this, I extracted the data from each individual dataset and uploaded it to Voyant.com. Voyant Tools is a web-based, open-source application used for performing textual analysis. The tool helps to support the interpretation of texts or corpi. The tool enabled me to examine patterns such as readability, word choice, word exclusion, lexical density, sentence length, word frequency, and the amount of words used. I know that the accounts that my research examines all had Verified accounts as well as tweets that were not protected. Thus, I chose not to include those elements in my dataset.

I then chose to merge each individual Excel Sheet together so that the content of the tweets from President Higgins, Mr. Trump, and the Prime Minister Johnson altogether. By having all of the tweets merged together on one Excel Spreadsheet, it made the data easier to analyse.

**Developing Code Definitions**

When developing my data collection methods, I created code definitions to apply them to the data that I am collecting. Code definitions help to provide structures for the elements of
information and the metrics are within the elements of information. I formulated metrics to use when aiming to extract insights from Twitter. I defined each metric and explained what each one of metrics measure, why they are important, and also outlined their definitions.

The following terms will be defined in this section:

1. Element used
2. Definition of element
3. Metrics within an element
4. Rationale for including the metric

According to Investopedia, “Metrics are measures of quantitative assessment commonly used for assessing, comparing, and tracking performance or production.” Metrics are used to measure particular aspects of the research elements. For example, the element of a tweet may have three metrics. The metrics that I will be examining are the average tweets per day, the average tweets per week, and the average tweets per month from each user.

I will be looking into the element of a tweet and then examining a particular metric to extract data about the world leaders. I have also included the rationale for including the metric that I will be examining. The rationale helps to explain why looking at a particular piece of data would be important.
Explanation of *Basic Elements Used*

| Term                  | Definition                                                                                                                                                                                                 |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Elements Used   | The basic elements reflect the basic elements that I will be exploring that are common to all Twitter users. These elements are: Tweets, Retweets, and Replies.                                                |
| Metrics               | Metrics are specific aspects of each particular tweet within an element that is being measured i.e. Average tweets per day or per week.                                                                     |
| Tweets                | A tweet is a basic element used by the users in the data. Tweets are the original written content produced in 140 words on the social media site Twitter. The rationale for including the metric in the research is because you must look at the tweets to examine the tweets of the world leaders. The implications that this element has on the research is that you need tweets because it is a primary source of data we are drawing from. The tweets per day will show what the world leaders were discussing on that particular day. The tweets per week will give insight into what the world leader focused on the most that particular week. The tweets per month will be able to show how often the world leader used Twitter as a platform in that particular month. I know that the metrics are only measuring the daily, weekly, and monthly amount of times the user tweeted. However, when I apply Voyant Tools, I will be able to see exactly what type of things the world leaders were discussing and connect it in terms of COVID-19. |
| **Retweets** | Retweets is the action of a user ‘re-posting’ or forwarding another user's original content onto their own timeline, a display of a stream of tweets from accounts you have chosen to follow on Twitter. Further, Twitter defines a retweet in a section entitled “What is a Retweet?” in their Help Frequently Asked Questions page. Twitter defines a retweet as: A Tweet that you share publicly with your followers is known as a Retweet. This is a great way to pass along news and interesting discoveries on Twitter. You have the option to add your own comments and/or media before retweeting. When using Twitter's Retweet icon, your retweet or quote tweet will reference the tweet you are sharing. When someone replies to your quote tweet, the author of the original tweet will not be automatically added to the conversation. If you want to include the author of the original tweet, you will need to mention their username. The rationale for including retweets in the research is because retweets indicate the spread of information to both academic and public-facing Twitter accounts. Retweeting can help us determine the extent of the spread of information.

In addition to sharing other’s tweets on Twitter, with your own tweet you can retweet or quote tweets. This function is particularly useful when you want to re-post one of your older tweets because it is relevant again, or retweet your replies to other people when you want to make sure all of your followers see it. |

| **Metrics within an element** | Metrics being measured from each retweet

- Average retweets per day |
### Replies

The replies that the users have replied to the original tweet that the user has tweeted. According to Twitter, the Reply Overview discusses that a reply is “a response to another person's Tweet. You can reply by clicking or tapping the reply icon from a Tweet. When you reply to someone else, your Tweet will show the message Replying to... when viewed in your profile page timeline.” The rationale for including replies in the research is because replies provide details to the opinion of the public and gives insight to who wants to be engaged with the content of the leaders. Looking into the replies of a particular user to another is helpful because it can offer insight into what exactly is important or deemed important by the user based on their response.

**Metrics within an element**

- Average replies per day
- Average replies per week
- Average replies per month
### Explanation of *Voyant Tool Elements*

| Term                  | Definition                                                                                                                                 |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| **Voyant Tools**      | Voyant Tools is an online database that helps to break down and expand on a particular article or writing uploaded. Voyant Tools serves as a “a web-based reading and analysis environment for digital texts” (Voyant, 2020). On Voyant Tools, the elements that I will be looking into are: the most mentioned keywords, corpus terms, and contexts. |
| **Frequently Mentioned Terms** | The keywords that are mentioned the most in a textual corpus. I will be examining the keywords that are mentioned the most in the user tweets. |
| **Corpus Terms**      | Voyant Tools defines corpus terms as “a table view of term frequencies in the entire corpus” (Voyant Tools). The corpus terms will help to identify how many times a word particularly mentioned by a user. |
| **Contexts**          | Contexts, which are the keywords in context, work as a tool that “shows each occurrence of a keyword with a bit of surrounding text” (Voyant Tools). Contexts help to situate the conversation that will be centered around particular key words. |

### Explanation of **Contextual Functions**

| Term                 | Rationale                                                                                                                                 |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| **Contextual Functions** | Contextual information is important because the phrases can help refine the argument that needs to be made by the users. This is important because the contextual functions |
can help to discuss types of communication that happen on Twitter that are not defined as official Twitter functions, phenomena, or actions.

| Phenomenon | A phenomenon is a fact, occurrence, or circumstance observed or that is observable. The areas of a phenomenon that I will be looking at is the degree of awareness and unawareness of the user. |
| Types of Phenomena | There are two types of phenomena that can occur: subtweeting and tweet-watching. |
| Subtweeting | Subtweeting, although not a convention that is formally recognized by Twitter.com, is a vital aspect of communication between users and communities on social media. |
| Tweet-watching | The definition of this element describes the aspect of a user visiting another user's page and then watching the content that is produced there. Users are usually unaware of other users' tweet-watching habits. The rationale for including this metric in the data is because tweet-watching is a phenomenon that happens when users are trying to figure out what their competitors are doing. |

| Actions | Action can be defined as a concept that involves an agent performing something. The actions are defined as actions that the Twitter users can take to engage with particular content. Some of the actions that a Twitter user can take is to ‘like’ content that is |
published on Twitter. Another action is ‘quoting a tweet’ or simply to ‘follow’ or to ‘unfollow’. All of the actions help to make up the Twitter user's engagement with a particular set of material on Twitter. These actions are needed because it provides important information on the users views and how they think about a particular topic. Actions are also important because it helps to give researchers a strong idea of how the user thinks or feels about a particular topic. Understanding what the users think on a particular topic or subject can be beneficial to us as researchers because actions may or may not refine the thought process of the user. There can be four types of actions:

**Like**

A like can be defined as the physical action of clicking the ‘like’ button on Twitter. According to Twitter, “Likes are represented by a small heart and are used to show appreciation for a Tweet” (Twitter).

**Quoting a Tweet**

Quoting a tweet is similar to retweeting a tweet. However, when a user quotes a tweet, they are able to quote the original tweet with the feedback of their own ideas or input.

**Unfollow**

An unfollow is when a user unfollows another user on Twitter.

**Follow**
A follow is when a user follows another user on Twitter.

**Explanation of *Awareness or Non-awareness of User Engagement***

| Term          | Definition                                                                 |
|---------------|-----------------------------------------------------------------------------|
| User Awareness| User awareness can be defined as when the user is aware of a change or their lack of being aware of a particular change. For a user to be aware, the actions that happen to that user, the user is aware of. |
| Unaware       | Actions that happen that users are not aware of.                             |
| Aware         | Actions that happen that users are aware of.                                 |

**Explanation of *Levels of Agreeability***

| Term           | Definition                                                                 |
|----------------|-----------------------------------------------------------------------------|
| Agreeability   | The levels of agreeability could be important when determining what the user cares about and their stance on a particular part of policy developed in relation to COVID-19. Also, agreeableness could help us engage with the information to assess |
whether the user shows ‘solidarity’ with a policy based upon their tweets, which can be viewed as ‘overt agreeableness’.

| Passive agreeableness | On the contrary, passive agreeableness can be viewed as openly agreeing or showing solidarity with a particular tweet. With solidarity, this can show the users stance on a particular issue. When a user shows a sense of agreeability. |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overt agreeableness  | Overtly agreeing with the tweet in question or solidarity with a tweet.                                                                                                                               |

**Other Metrics to be Measured (Optional)**

| Element                  | Definition                                                                                                                                                                                                 |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Top Retweeted Tweets     | This metric measures the tweet that was retweeted the most. Looking at which tweet was the most retweeted tells a lot about what the public or fan base thinks more than the users themselves. |
| Top Liked Tweets         | The metric measures which tweet was liked by other users on Twitter. This metric is important because it measures public opinion and response from users other than the governmental leader. Some of these users may oppose the governmental leader and this information can be beneficial because it would help us to define the stance of |
the public from a Twitter demographic in a way even though it is not overtly in agreeance, 'liking' a post is a passive form of agreement.

| Most Mentioned Username | These are the usernames that are mentioned the most in the particular timeline by the person. The rationale for the most mentioned username shows who the user cares about and also gives us insight into their relationship to other users. |

**RESULTS**

Twitter is utilized to spread scientific messages because it is a social media network where individuals engage in mass personal and public information sharing. In the 21st century, there are numerous ways to share information, particularly, podcasts and blogs. Boulos and Geraghty (2020) argue that 21st century Graphic Information System (GIS) technologies are creating spaces to fight against outbreaks and epidemics globally. Boulous and Geraghty (2020) argue that the geographical tracking and mapping system of COVID-19 is helpful and effective in keeping track of data. Further, they advocate how both medical professionals and scholars can properly track coronavirus. Specifically, the article discusses how "the WHO dashboard includes an epidemic curve up front, showing cases by date of reporting" (Health Geographics). Understanding the views of the WHO, one of the stakeholders and scientific opinions on COVID-19, helps to situate knowledge.
Boulos and Geraghty map how misinformation about COVID-19 also spreads worldwide. The authors provide an example that illustrates how fear among the general public could cause false and misleading information. The authors express how “during infectious disease outbreaks and epidemics, social media play an important role in communicating verified facts and correct prevention tips to the masses” (Boulos and Geraghty, 2020). However, this also can be an issue if the information being provided is misleading. The authors express how Twitter itself can be misleading if not utilized properly and the correct information is not presented. Boulos and Geraghty express how “not all tweets and retweets with the hashtag #coronavirus are spreading misinformation, and many of them originate from legitimate bodies and organisations such as the WHO, but the map serves as a good illustration of the ‘viral nature’ of Twitter and other social media” (Boulos & Geraghty, 2020). This helps to situate how the WHO plays a role in providing legitimate information. This information is helpful for defining how the WHO provides information about COVID-19.

Twitter has proven itself as a place where COVID-19 has had several ideologies, theories, and input from the public, medical professionals, religious bodies, academia, etc. Whilst much of the information on Twitter that has been produced engages the public interest and concern around the pandemic, it is critical to note the platform’s usage for spreading scientific messages. Decker et al. (2020) argues that a “particular interest in this work is the use of Twitter for spreading scientific information”.

In the results section, I am going to report the results that emerged from my data collection. The following data is a report of the tweets, retweets, and replies of President
Higgins. The datasets for the basic elements used include the tweets, retweets, and the replies of each of the users that the research is examining.

Twitter User
Michael D. Higgins
President of Ireland Dataset

*Figure 1*
Michael D. Higgins Basic Elements Used
In the Figure above, the *Basic Elements Used* reflects the tweets, retweets, and replies in the President Higgins dataset. The graph shows that between the onset of COVID-19, December 30, 2019 to May 30, 2020, President Higgins had (918) tweets, (31) retweets, and (3) replies. President Higgins had an overall amount of 2,874 lifetime tweets up until September 29, 2020.

**Retweets**

When analyzing the dataset for President Higgins, I looked at lifetime retweets on the account, which was (223) total retweets. Then, from there, I examined retweets only from the timeframe of December 2019 to May 2020.
The Figure above reflects the number of retweets that President Higgins had during the scope of the research period which was between December 30, 2019 and May 30, 2020 in comparison to his total number of lifetime retweets. The President Higgins retweeted (31) tweets total during this time and had a Lifetime Retweet of (223). Further, when exploring President Higgins’ retweets, I examined the metrics within the retweet element. The metrics that are being measured from retweet are the average retweets per day, average retweets per week, and average retweets per month.
In terms of subtweeting, President Higgins’ did not subtweet at all in any of his total tweets. President Higgins’ conversations have been very direct and also demonstrates his direct involvement with others by using the “@” feature, a feature where the user can mention another user on Twitter.

**Levels of Agreeability**

When searching all of President Higgins’ tweets for the specific terms relating to COVID-19, the data reflected that around March 2020, President Higgins’ tweets showed positive reflections and agreeableness with motions to work towards developing implementation for policies related to COVID-19. One of the specific terms searched within President Higgins’ tweets was ‘virus’. The term ‘virus’ was mentioned (18) times. One of his tweets was written on his behalf using Tweet Deck, a software that tweets pre-written tweets on the interface for the user. The tweet is shown in the figure below.

**Voyant Tools Analysis**

A corpus was created with the words and phrases from President Higgins’ tweets ranging from December 30, 2019 to September 29, 2020. This was done to get a full contextual understanding of the types of topics President Higgins discussed on his personal Twitter account. The corpus had (29,269) total words. President Higgins tweeted (38.7) Words Per Sentence on average. Specific key terms were noted to gain an understanding of his overall social identity presented on Twitter as well as the context around his views and ideas of coronavirus. The most frequent words in the words, excluding stop words, were:
Top Keywords mentioned on President Higgins’ Twitter Account

A translator was used to separate the tweets published in Irish versus in English. The words mentioned in Irish were: ar (302), agus (211); ó (174); uachtaráin (161); tuachtarán (159), uachtarán (76), héireann (52)
The tweets in Irish could be seen to connect the public to “staying home” as well as asserting a sense of authority of the President of Ireland because the language points back to this. In the tweets before December 30, 2019, President Higgins tweeted numerous times about “home” which shows that Ireland, in a sense, was already very ‘home’ oriented before
COVID-19. Rice and Giles (2017) in “The Contexts and Dynamics of Science Communication and Language” expand on how the language of science communication may not only include defining scientific jargon and phrases, but also understanding the contexts of a particular area in the rhetorical discourse. Rice and Giles (2017) implicate that there needs to be a strong sense of understanding and contextual capturing of a language to fully gauge the understanding of a particular text. Rice and Giles express how “organizations, institutions, policymakers, and citizens need to understand scientific information in order to make better decisions, develop reasoned attitudes toward or against developments” (Rice and Giles, 2016, p. 127).

Further, Huckin (2004) in Content Analysis: What Texts Talk About discuss contextual practices and frameworks that should be considered when facilitating a content analysis. Bakshy (2011) shares that “content analysis provides an alternate option for identifying influencers. Some studies use complex methods, such as ranking quality of language or tracking URLs over time, for assigning levels of influence to individuals” (Bakshy et al., 2011). Examining the content along with the framework that situates the knowledge on Twitter helps to develop a strong influence on Twitter for the users. Now, the way that President Higgins discusses home is in a sense of “connection” and “communication” to get the message to the Irish people. One of his tweets discussing COVID-19 specifically included the term ‘home’ in it.

The term ‘President’ or “Presidents’ was mentioned three different ways in terms of the tweets. This communicates that the central communication from the account was on behalf of the President or discussing the President’s role in political or social action. Brandt and Botelho (2020) highlight how "biologic, environmental, social, and political forces are shaping the spread of COVID-19 around the world". This is critical information because it highlights how people
are discussing COVID-19 and how it is being constantly defined daily. Also, realizing the role that political figures have in COVID-19 shows that communicating about the pandemic itself shapes the human experience.

The term ‘éis’ was mentioned (39) times in the corpus. Particularly, the term was associated with COVID-19. Several of the tweets with the term ‘éis’ looked towards or forward to a ‘future’ after covid. This preposition was interestingly used in several places in the corpus throughout the month of May, specifically on May 15, 2020.

The specific tweet that used the term stated: "Tá cuid de ráiteas an Uachtaráin mairid leis an phaindéim covid-19 ar fáil anseo: https://t.co/ZsKy8BByN6 https://t.co/Elf4rrpFP6" (Twitter, 2020). This tweet can be translated as: “Part of the President 's statement on the Covid-19 pandemic is available here” (Twitter, 2020). This shows how much of the President's content pointed to speeches that were linked to the tweet but were not directly presented on Twitter itself like Mr. Trump has done. This tweet was also pre-written and set up using Tweet Deck that shows that President Higgins prefers interactions that are not directly on the platform itself, but rather includes a third-party. By using third-parties, the users can develop more composed and planned-out content. Thus, with COVID-19, he has the ability to think through what he is saying as well as potentially gain the opinions of other stakeholders around him before he publishes content.
Twitter User
Boris Johnson

Prime Minister of the United Kingdom Dataset

When analyzing the dataset for Prime Minister Johnson, he had (231) tweets between the timeframe of December 30, 2020 and May 30, 2020. Compared to President Higgins, Prime Minister Johnson tweeted less during the initial phases of COVID-19. This may reflect that the United Kingdom was still working to develop and reach consensus on a strategy in response to COVID-19. As a result, this caused less conversations on social media for Prime Minister Johnson.

| Name of Element | Number of Times |
|-----------------|-----------------|
| Tweets          | 231             |
| Retweets        | 307             |
| Replies         | 32              |

*Figure 5*
Prime Minister Johnson’s number of Tweets, Retweets, and Replies
Tweets

Prime Minister Johnson's tweets have an overall tone of aiming to include the public in decision making. His tweets demonstrate early on that he is aiming to be action-oriented and focus on the strategic plan to work on figuring out more about COVID-19. When a close-read of several tweets was done, I drew up common themes found when he mentioned the specific terms “COVID-19” and “Coronavirus”.

| Date             | Tweet                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| May 12, 2020     | "We have published a roadmap for how and when the UK government will adjust our response to the COVID-19 crisis. You can read it here: https://t.co/2UDISpapN4 #StayAlert https://t.co/3cjzIDNF5j" |
| May 28, 2020     | "If we are to defeat COVID-19, achieve a global recovery and avoid a future"                                                             |
| Date               | Message                                                                                                                                 |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| June 26, 2020      | "Congratulations to Ireland 🇪🇪 on forming a new Government and to @MichealMartinTD on becoming Taoiseach. Ireland is our closest neighbour, good friend and ally on issues such as climate change, the global fight against Covid-19 and our shared values on human rights and democracy." |
| June 27, 2020      | "Businesses all over the country are getting ready to open their doors again on the 4 July.  
Yesterday I heard from @PizzaPilgrims staff about how they’re making their restaurant COVID-19 Secure so customers can enjoy their pizza safely.  
https://t.co/19B4xd3KtX"                                                                                                                   |
| July 2, 2020       | "Today I spoke to business leaders who are supporting the government's #EnjoySummerSafely campaign.  
As more hospitality and leisure businesses open from this weekend, everybody must follow the COVID-19 Secure guidelines wherever they are to protect themselves and others.  
https://t.co/KWS0AidQE6"                                                                                                                  |
| July 7, 2020       | "We’ve announced a £1.57 billion package to support our brilliant theatre and creative sectors."                                             |
Prime Minister Johnson mentioned “COVID-19” twice in the month of May. In the two
tweets, he addressed a potential roadmap of the plan for the United Kingdom moving forward
and how the issue of COVID-19 would be formally addressed across borders. He mentioned how
they were all seeking ‘global recovery’ and also discussed how the United Kingdom government
would ‘adjust’ to the crisis. These tweets insinuate the urge to take action in terms of COVID-19.

Other terms that were searched in the corpus were ‘coronavirus’. Prime Minister Johnson
mentioned ‘coronavirus’ 38 times in his tweets. His tweets reflected on how he spoke to the
Chinese President Xi Jingping on February 18, 2020 to express his “sympathy and support for
those affected by the coronavirus outbreak” and further expanded on how the “UK government
has donated vital medical equipment to the region...will continue to offer our assistance”
(Johnson, 2020).
Further, other tweets expanded on the NHS being “incomparable staff”. Prime Minister Johnson contracted the coronavirus in April 2020. During the time that Prime Minister Johnson got COVID-19, he specifically shared that he was very thankful to the NHS. The United Kingdom started an initiative formally known as *Clap for Our Carers*, later coined on Twitter.com as #ClapForTheNHS. #ClapForTheNHS was “created as a gesture of appreciation for the workers of the United Kingdom’s National Health Service (NHS) and other key workers during the global pandemic of Coronavirus disease 2019 (COVID-19), which spread to the United Kingdom in January 2020” (Wikipedia, 2020). This showcased the solidarity and agreeableness of the United Kingdom as opposed to other members of society in the United States.

**Replies to Public**

Prime Minister Johnson relied on using Twitter Web, tweeting directly from a computer and Twitter Media Studio, tweeting from an online app that has pre-typed tweets to communicate regarding the search term “COVID-19”. Also, according to Twitter, Media Studio is “An easy-to-use platform to manage, measure and monetize your video on Twitter” and also allows you to share more than (280) characters and manage content (Twitter, 2020).

Prime Minister Johnson choosing to rely on a media app that allows you to tweet more than the original (140) characters is helpful and allows the users to stay connected both textually and by traditional news outlets and video speeches published by him and his team. Rhetoricians “attempt to understand better every kind of important symbolic action - speeches and articles” (Selzer, p. 280). According to Kentish (2020), “this understanding of symbolic action of
speeches and articles can be applied to social media posts on Twitter platforms when looking at a global pandemic” (p.15). Prime Minister Johnson sharing video speeches embedded in tweets is helpful because it enhances credibility. Additionally, Kentish (2020) shares that “exploring the rhetorical act...shapes the views of society” (p. 15).

![Boris Johnson Basic Elements Used](image)

**Figure 7**

Boris Johnson Basic Elements Used

By Prime Minister Johnson sharing speeches embedded in tweets, the public becomes a part of conversations that are global and central about COVID-19. Further, Selzer (2004) state that “if those pieces of writing have a persuasive intent, especially if (in other words) they have designs on your beliefs and attitudes (and nearly all writing does have that purpose, to some extent), the activity known as rhetorical analysis can offer you additional perspective and understanding” (p. 279). Thus, pieces of writing, including tweets, may have a persuasive tone to implicate the personal beliefs of the users.
Retweets

Prime Minister Johnson depended more on retweeting as opposed to merely tweeting. Prime Minister Johnson’s dependence on retweeting focused on conversations about how to manage the developing COVID-19 and also helping to support the governmental decision to “stay inside” and remain “socially distant”.

**Figure 8**

Boris Johnson Retweet Pattern

The retweet pattern above is an analysis of Prime Minister Johnson’s total number of lifetime retweets compared to the amount of times he retweeted during the months of December and
May. Prime Minister Johnson retweeted (307) tweets during this timeframe and had a lifetime total of (1,497) tweets.

**Replies**

In terms of Prime Minister Johnson's replies, there was a specific period when he did not reply to anyone publicly on Twitter for two consecutive months. This shows that Boris may have been aiming to deal with the onset of COVID-19. It also reflects how COVID-19 was unprecedented and difficult to fully explain. He had a lapse in his replies between December 2019 and February 2020.

The replies to Twitter users before those in the United Kingdom understood the implications of COVID-19 was very different from the replies after COVID-19 was being handled and under control. The following corpus was developed to trace the replies to Twitter users during the time frame of December 30, 2019 and May 30, 2020.

**Most frequent words** in the corpus: stayalert (16); work (10); home (8); level (7); nhs (6); stay (5); able (4); lives (4); measures (4); save (4); alert (3); begin (3); conditions (3); distancing (3); know (3); safe (3); say (3); social (3); stand (3); step (3); sure (3); time (3); uk (3); virus (3); absolutely (2); advice (2); amp (2); avoid (2); believe (2); below (2); better (2); business (2); can’t (2); care (2); change (2); changes (2); control (2); country (2); covid (2); critical (2); dangerous (2); data (2); depends (2); determined (2); difficult (2); disease (2); earliest (2); ensure (2); family (2); follow (2); getting (2); going (2); half (2); hospitality (2); invisible (2); levels (2); local (2)
The words presented above served to be instructional and warnings to the general public. The replies to people also include advice to follow “social distancing” policies set in place by the United Kingdom. Also, the replies to users discussed potential communication about ‘changes’ and ‘steps’ to keep the public safe.

** Replies After Research Scope 

Prime Minister Johnson's replies after the research scope between the months of June and September 2020 reflect very differently from when COVID-19 first began. Taking a detailed look into the replies to the public as well as other political leaders, Prime Minister Johnson's replies began focusing on local action, work, family, school, home, the NHS, and the authorities.

The most frequent words found in his Twitter replies to other users reflected in the corpus as:

Most **frequent words** in the corpus: local (11); action (5); work (5); country (4); people (4); today (4); areas (3); authorities (3); away (3); come (3); different (3); families (3); far (3); friends (3); generations (3); home (3); ireland (3); lives (3); nhs (3); northern (3); outbreaks (3); premises (3); risk (3); school (3); stay (3); week (3); working (3); world (3); year (3); agreement (2); area (2); begin (2); children (2)
The figure above illustrates that Prime Minister Johnson took an approach to be more communicative about COVID-19 and implement direct communication and responses to questions via textual engagement.

Figure 9
Most Frequent Words Mentioned in Twitter Replies Post COVID-19 Onset
When analyzing the dataset for Mr. Trump, Voyant Tools was used to facilitate a metadata analysis of his tweets and replies to others during the time frame of December 2020 to May 2020.

After a metadata analysis was facilitated, a close reading was done looking at specific mentions of the words “COVID-19” and “coronavirus”.
Figure 10
Mr. Trump’s Most Frequent Words Mentioned in Tweets

Most frequent words in the corpus: great (330); thank (209); news (148); people (118); just (117); fake (112); democrats (98); new (91); house (89); president (89); doing (71); american (68); job (68); foxnews (66); states (66); strong (66); trump (66); big (65); like (62); country (60); going (60); impeachment (60); good (59); coronavirus (58); mike (58); time (58); today (57); hoax (54); democrat (53); mini (53); state (53); want (53)

This shows that Mr. Trump focused on the news, his role as the President, impeachment, his relationship to others, and COVID-19 itself. His most frequently tweeted word at this time was “great” and could potentially be attributed to his presidential campaign slogan: “Make America Great Again”. Mr. Trump also emphasized the word ‘fake’, which he mentioned (117)
times in his tweets. Some of Mr. Trump’s tweets that discuss when he used the word ‘fake’ are included below.

| Date               | Tweet                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| February 26, 2020  | "Low Ratings Fake News MSDNC (Comcast) & @CNN are doing everything possible to make the Coronavirus look as bad as possible, including panicking markets, if possible. Likewise their incompetent Do Nothing Democrat comrades are all talk, no action. USA in great shape! @CDCgov....." |
| February 28, 2020  | "Diagnosis positive: @CNN is infected with Trump Derangement Syndrome. I’m calling out CNN for irresponsibly politicizing what should be a unifying battle against a virus that doesn’t choose sides.” @trish_regan @FoxNews Like I say, they are Fake News!" |
| March 5, 2020      | "I NEVER said people that are feeling sick should go to work. This is just more Fake News and disinformation put out by the Democrats, in particular MSDNC. Comcast covers the Coronavirus situation horribly, only looking to do harm to the incredible & successful effort being made!" |
| March 5, 2020      | "The Department of Education is NOT closing hundreds of schools in rural areas of our Country. This is just more Fake News. We are investing greatly in our schools, and always will!" |
| March 6, 2020      | "It is FAKE NEWS that @HHSGov @SecAzar is “sidelined” from the great job he is doing on the CoronaVirus Task Force. He has the total confidence of the @VP and myself, and is doing a fantastic job, as the numbers would indicate!" |
| Date          | Tweet                                                                 |
|--------------|----------------------------------------------------------------------|
| March 8, 2020 | "We have a perfectly coordinated and fine tuned plan at the White House for our attack on CoronaVirus. We moved VERY early to close borders to certain areas, which was a Godsend. V.P. is doing a great job. The Fake News Media is doing everything possible to make us look bad. Sad!" |
| March 9, 2020 | "Also. There seems to be a Leftist trope that the Covid19 is a “hoax.” You do a disservice by spreading fake information. Neither @realDonaldTrump nor anyone else called the existence or persistence of the #COVID19US a hoax. If you believe this you are out of touch." |

The tweets presented include the word ‘fake’, which is one of the top 10 terms that Mr. Trump mentioned between December 2020 to May 2020. When facilitating a close-read on the tweets, several of the tweets that mentioned ‘fake’ were in reference to how Mr. Trump believed that the media was misinformed or misrepresenting his views or ideologies about COVID-19. Several of the tweets that used the key word also directly or indirectly acknowledged COVID-19, the communities it affects, and how Mr. Trump stated will move forward. Mr. Trump also shared tweets about COVID-19 and the way that he would manage it early on. Mr. Trump expressed that schools would not be closing down and that the closure of schools may be ‘fake news’. Mr. Trump also expressed that the ‘panicking markets’ were ‘fake news’.

Further, Mr. Trump subtweeted about the Democratic Party and shared early in February 2020 that none of what they were communicating about student loans, markets, and schools were true. During this time, Mr. Trump expressed that there was miscommunication about his stance on particular policies. Mr. Trump also expressed how he did not call COVID-19 a hoax. He shared this in the tweet above which was tweeted in March 2020.
On October 2, 2020, Mr. Trump shared a tweet expressing that he had contracted COVID-19. The tweet shared that both he and his wife, then-First Lady Melania Trump, had both contracted COVID-19. He stated that he would begin the quarantine process and recover, as reflected in the image below. The tweet went viral and had more ‘quoted’ tweets, which is when a tweet has a response to it. The responses to this particular tweet focused on several aspects of his general health.
In the analysis section, I am going to analyze the tweets to draw unique information from the tweets. I will also analyze the data created in Voyant Tools to see what I am able to extract.

Twitter User, Michael D. Higgins, President of Ireland

Tweets
The tweet published on April 15, 2020 expands on how he is thankful to Irish medical staff who are caring for people not only at ‘home’, but also across the globe. This shows that the Irish government cared about the implications of COVID-19 and the staff working to serve others.

The traditional way that President Higgins addressed the people was by video message and speech. President Higgins chose to address the people in public by video in a speech to convey respect to ensure that the message to the people was personal. By utilising a multimodal tool like Twitter, President Higgins was able to embed much of his messages there; he referred to
"special messages" into a tweet. By personalising communication, President Higgins fostered public appreciation for his service and further instilled trust through visual rhetoric. Tufte (2001) explains how "words, graphics, and tables are different mechanisms with but a single purpose - the presentation of information" (p. 181). Thus, visual communication is a large facet of communication and information sharing.

Figure 14
Tweet from President Michael D. Higgins on March 13, 2020
This tweet has keywords such as “solidarity,” and “co-operation” which show an interest of Ireland to work towards the confrontation of COVID-19 in its early stages. President Higgins’ usage of Tweet Deck also showed that he relied on pre-written content around the topic to ensure that it was discussed in a timely and organized manner. Specific interactions with the specific tweet from the public provides more information and insight on the Irish Government’s shift to dealing with the unprecedented pandemic. On March 14, 2020, a member of the public, @jamesfitz2 shared that he was “proud to have this man as our President” in the tweet here: https://twitter.com/jamesfitz2/status/1238754517312655360

On March 13, 2020, another member of the public, @emmaphickey shared the following tweet:

“Thank GOODNESS we have Miggeldy as our president. Vastly intelligent, compassionate, well-informed and articulate. A calming influence. He makes me so proud” (Twitter, 2020).

Thus, the public “quoting” his tweet and replying to it signified his ability to lead and represented a public opinion of President Higgins being a good leader during the pandemic. In this case, the action of ‘quoting’ a tweet and replying to it was beneficial for the user because it helped to build his credibility and support his claims. Szomszor et al. (2011) express how the “dynamics of information dissemination during important global events”. This is important when examining how public figures and leaders present themselves online as well as having the
backing of supporters. Further, @emmaphickey shared that the President had a calming
‘influence’. Dubois and Gaffney (2014) define influence as “the ability to influence (convincing
an individual to change his or her opinion, attitude, and/or behavior)” and assert that to have this
“is a powerful skill” (p. 1261). The user’s ability to influence others on Twitter may mean that he
is able to influence others to follow his leadership and trust his abilities. The mention of
influence by the user encourages the need for political influence and this may transcend to
Twitter influence on social media.

The President may be able to “influence his or her close personal ties by exerting social
pressure and social support” (Dubois and Gaffney, 2014, p. 1262). Influence on Twitter replies
on the interactions and support from followers. Further, Dubois and Gaffney (2014) define the
four large areas of influence as: “having a following, seen as an expert, knowledgeable/have
expertise, and in a position within their local community to exert social pressure and social
support/social embeddedness” (p. 1262). When a user has a following, a community is built and
developed around the particular discourse of that user. The user that showed overt agreeability
with President Higgins’ tweets solidified their agreement and alignment with the way that he is
handling issues.

Further, Kentish (2020) shares how Szomszor et al. in their article Twitter Informatics:
Tracking and Understanding Public Reaction during the 2009 Swine Flu Pandemic “expresses
how Twitter is popular for microblogging” (p. 12). Further, Szomszor et al. (2011) shares how
there is an “explosion in popularity of social media” because it has “subsequently raised
concerns about the quality of information that is present online...and it reaches various members
of the population” (Szomszor et al., 2011). Further, Kentish (2020) shares how “this is a
constraint of utilizing Twitter to explore what the public has said because it can be viewed as an untrusted blog” (p. 12). Thus, President Higgins may indeed be supported and show overt agreeableness by several of his followers on particular plans for COVID-19.

Szomszor et al. (2011) investigated whether or not Twitter users “have a preference when promoting online materials, for example, for official government health bodies over those untrusted blogs” (Szomszor et al., 2011). When looking at COVID-19, governmental organizations, and the personal tweets published on President Higgins’ page, this information can be helpful when examining his own plans for implementation of policy for COVID-19.

Replies

I analyzed the replies that President Higgins received when examining his dataset. The following analysis presents a detailed view of President Higgins’ replies. President Higgins had (103) lifetime replies. However, from the scope dates for this research, there were only (3) replies total to the tweets that this user tweeted. Thus, it indicates that President Higgins was not very engaged or active on social media during the time that COVID-19 regulations and policies were being developed. However, President Higgins was active several months before COVID-19 had affected the world.

Twitter User, Boris Johnson, Prime Minister of the United Kingdom

Tweets
Prime Minister Johnson’s overall tweets shedded light on detailed directions on how the public ought to manage COVID-19 in relation to themselves and others. He provided detailed communication between himself and the leaders of other nations. He also used Twitter as a platform to link the public to vital information on what actions to take if they had COVID-19 symptoms and how to get access to critical information. Brandt and Botelho (2020) expressed the importance of using "disease tracking and surveillance, scientific research, and public health infrastructure" to help to track the pandemic (p.1494). However, such action is not easily taken in relation to COVID-19. Thus, Prime Minister Johnson’s sharing of information about COVID-19 from a scientific perspective can be helpful in keeping the public informed and ensuring they have access to accurate information.

Further, Prime Minister Johnson relied heavily on support from various sectors such as Chief Medical Officer of England Professor Chris Whitty in early March 2020 when the United Kingdom was still aiming to figure out how to manage and deal with COVID-19. Professor Whitty shared the following tweet on March 17, 2020:

Figure 15
Tweet from Prime Minister Johnson
By sharing this tweet, Prime Minister Johnson aimed to provide advice on how exactly COVID-19 would affect others and what demographics the virus could potentially affect. Prime Minister Johnson utilized captions in the video to respond to members of the disabled communities who may have accessibility needs. The video addressed how social distancing would have serious implications for people in social settings and would be difficult to maintain. By highlighting this fact early on, Prime Minister Johnson showcased his preparedness to deal with the situation. Egbert et al. (2020) in *Headlines and Hashtags: Communicating Science During an Outbreak* argue that “scientists need to know what engages the general public and how to communicate complex scientific information in a responsible way that can be accurately understood by the general public” (Egbert et al., 2020). This is important because Prime Minister Johnson decided to link to formal science documentation within the tweet. This is helpful and can imply that based on Prime Minister Johnson tweets, he understands that people need to have access to detailed, scientific information on the developing issue.

Twitter links are important when users post them. According to Szomszor et al. (2011), "Twitter users post links to a variety of online resources, such as news articles, blogs, videos, etc, usually because they have some interest in them and /or they want to advertise them to their followers" (p. 321). This important aspect requires attention when reviewing the tweets of government officials and organizations. Szomszor et al. (2011) continues to share that the "analysis of the links posted on Twitter provides some insight into the interests of the Twitter population" (p. 321). The relevant population in the case of COVID-19 is the general public.

The way that COVID-19 affects the public can affect public health data. The tweets that the users have presented thus far have revolutionized how the general public views information,
engages with the government, and interprets and understands science. Users who are uninformed about the science behind COVID-19 may migrate to Twitter and microblog about the topic. Misinformation can spread when users lack a scientific background or an ability to understand the facts of a situation. In fact, Szomszor et al. (2011) shares that "Claims are often made that these forms of communication may promote the consumption of fringe beliefs and scientifically unsound information" (p. 320). Further, Rufai and Bunce (2020) argue that "World leaders can use their influence to address crises, especially by disseminating evidence-based information" (p. 3). Thus, if linking information is utilized correctly, the results can be effective for the world leaders to engage in linking scientific information and sharing it with the public.

Further, users who use Twitter to communicate that they now have COVID-19 may feel empowered narrating their experiences. For example, Brandt and Botelho (2020) share one of American intellectual Susan Sontag's stances where she "argued that the metaphors we use to describe disease profoundly shape our experience of illness; our cultural discourse regarding diseases such as cancer and AIDS, for instance, produces fear and stigma that hinder care and marginalize patients". Thus, the general public who have Twitter accounts may feel empowered to use Twitter to share their experiences about COVID-19. Sharing their experiences may shape their relationship to not only COVID-19, but also to how information is shared online by the users.

Further, tweets using the term ‘coronavirus’ discussed “stepping up testing,” “reducing the peak,” and “staying safe to save lives” (Johnson, 2020).

On May 1, 2020, Prime Minister Johnson tweeted the following statement about coronavirus:
“I can confirm that we are past the peak of this disease.

We are past the peak and we are on the downward slope.

And we have so many reasons to be hopeful for the long term.

But we can only defeat coronavirus by our collective discipline and working together."

Thus, this is evidence that the peak of the disease was between December 30, 2019 and May 30, 2020 and that much of the communication about COVID-19 for the United Kingdom was developing the next steps of execution.

**Replies**

The replies to Twitter users before the United Kingdom experienced and understood the implications of COVID-19 differed significantly from the replies after COVID-19 was being actively handled and under control. The following corpus was developed to trace the replies to Twitter users during the time frame of December 30, 2019 and May 30, 2020.

Most frequent words in the corpus: stayalert (16); work (10); home (8); level (7); nhs (6); stay (5); able (4); lives (4); measures (4); save (4); alert (3); begin (3); conditions (3); distancing (3); know (3); safe (3); say (3); social (3); stand (3); step (3); sure (3); time (3); uk (3); virus (3); absolutely (2); advice (2); amp (2); avoid (2); believe (2); below (2); better (2); business (2); can’t (2); care (2); change (2); changes (2); control (2); country (2); covid (2); critical (2); dangerous (2); data (2); depends (2); determined (2); difficult (2); disease (2); earliest (2); ensure (2); family (2); follow (2); getting (2); going (2); half (2); hospitality (2); invisible (2); levels (2); local (2)
The words presented above served to be instructional and warnings to the general public. The replies to people also include advice to follow “social distancing” policies set in place by the United Kingdom. Also, the replies to users discussed potential communication about ‘changes’ and ‘steps’ to keep the public safe.

**Replies After Research Scope**

Prime Minister Johnson's replies after the research scope between the months of June and September 2020 reflected very differently from when COVID-19 first began in Wuhan, China. Taking a detailed look into the replies to the public, as well as other political leaders, Prime Minister Johnson's replies began focusing on local action, work, family, school, home, the NHS, and the authorities.

The most frequent words found in Prime Minister Johnson's Twitter replies to other users reflected in the corpus as:

Most **frequent words** in the corpus: local (11); action (5); work (5); country (4); people (4); today (4); areas (3); authorities (3); away (3); come (3); different (3); families (3); far (3); friends (3); generations (3); home (3); ireland (3); lives (3); nhs (3); northern (3); outbreaks (3); premises (3); risk (3); school (3); stay (3); week (3); working (3); world (3); year (3); agreement (2); area (2); begin (2); children (2)
The figure above showcases that Prime Minister Johnson adopted an approach to be more communicative about COVID-19 and implement direct communication and responses to questions via textual engagement.

**Twitter User, Former President of the United States Mr Donald Trump.**

**Tweets**

During the research scope between December and May, Mr. Trump tweeted on a variety of topics including, but not limited to coronavirus, impeachment, the upcoming 2020 President
Election, etc. When examining the specific tweets of Mr. Trump, several tweets depict that he did not take any accountability on COVID-19 policies. Much of blame was placed on China, and Mr. Trump coined COVID-19 as the “China” disease. This reflected negatively on the United States because the spread of the disease proved to worsen overtime, due to little or no leadership. Although subtweeting is a contextual function, Mr. Trump also subtweeted about the COVID-19 and identified ‘China’ in his tweet. This tweet was published on July 20, 2020 when Mr. Trump tweeted the following:

“We are United in our effort to defeat the Invisible China Virus, and many people say that it is Patriotic to wear a face mask when you can’t socially distance. There is nobody more Patriotic than me, your favorite President!” (Twitter, 2020).

Having shared that the coronavirus was something from China to ‘defeat’, Mr. Trump insinuated that not only was America in a fight against an invisible enemy, but the enemy was now coined the ‘China Virus’. This posed an issue due to the virality of the tweet causing potential damage that associating the coronavirus with an entire culture or demographic location.
One of the retweets that Mr. Trump retweeted on April 14, 2020 from when he was inside of the White House according to the data, Mr. Trump retweeted the following:

"President @realDonaldTrump is halting funding of the World Health Organization while a review is conducted to assess WHO's role in mismanaging the Coronavirus outbreak. https://t.co/jTrEf4WWj0" (Trump, 2020).

Mr. Trump retweeting about halting funding from the WHO can showcase how he was not onboard with the WHO at the time. This had serious implications because the primary role of the WHO is “to direct international health within the United Nations' system and to lead partners in global health responses” (World Health Organization, 2020). If the United States and the
WHO should partner to deal with a global pandemic, disagreement during this time could render leading and partnering difficult.

Several world leaders were preparing for post-pandemic action. After Mr. Trump contracted COVID-19, he tweeted that the virus was "far less lethal" than the influenza. This tweet was controversial because it caused a public uproar between doctors, public officials, and the general public. Mr. Trump's tweet was censored by Twitter due to its controversiality and Twitter determined to remove the Tweet due to violation of its Rules as below. The tweet is presented below.

![Mr Donald Trump Tweet Comparing COVID-19 to the Flu](image)

*Figure 18*  
Mr Donald Trump Tweet Comparing COVID-19 to the Flu
Mr. Trump aimed to be persuasive and challenge the American people to continue to ‘learn to live’ with COVID-19 as opposed to finding effective ways to deal with it. In the tweet, Mr. Trump mentioned vaccines. Twitter shared that Mr. Trump had “violated the Twitter Rules about spreading misleading and potentially harmful information related to COVID-19” (Twitter, 2020). By saying this, Twitter acknowledges that Mr. Trump may not be tweeting accurately or in accordance with evidence-based information. Also, Twitter may see Mr. Trump’s tweet as misinformation. In an earlier address to the Nation that was embedded in a tweet, Mr. Trump shared how he did not wear a mask because “no leader” would during this time. Mr. Trump’s urge to encourage the American people.

On the contrary, Mr. Trump's political opponent in the 2020 Presidential Election, now-President of the United States Joe Biden, subtweeted about Mr. Trump in a video within an embedded tweet. The tweet highlighted the current statistics for COVID-19. President Biden stated in the video how Mr. Trump said: "Who is taking responsibility?" Also, President Biden mentioned the issue with Mr. Trump's leadership. By communicating this information during election season, Mr. Trump now likely would suffer issues with credibility on serious political issues.
Overall Analysis of Twitter Users President Higgins, Prime Minister Johnson, and Mr. Trump

Prime Minister Johnson has about an even number of tweets and retweets. This shows that he cares greatly about endorsements. On the contrary, President Higgins had a drastically different engagement with other users because he only had (3) overall replies during the months that this research examines.

Figure 19
Tweet from Joe Biden
In the chart above, Mr. Trump replied the most to other Twitter users during the time of COVID-19 onset. Meanwhile, President Higgins tended to have less replies and Prime Minister Johnson remained in the middle in terms of replies.
In the Figure above, Mr. Trump had the greatest amount of retweets during the time of the onset of COVID-19. However, President Higgins and Prime Minister Johnson did not have as many retweets as Trump.

One commonality between Mr. Trump and his British counterpart Prime Minister Johnson is that they both contracted COVID-19. In a news article titled “Boris Johnson shows what happens when a world leader gets Covid-19” published by NBC News, Prime Minister Johnson shared how he related to Mr. Trump in getting COVID-19. Prime Minister Johnson, who tested positive for COVID-19 just six months before Mr. Trump was “thought to be the first world leader confirmed to have contracted Covid-19” (NBC News, 2020). Thus, Prime Minister
Johnson had experienced COVID-19 before Mr. Trump. Prime Minister Johnson shared the following tweet on April 12, 2020 at 3:00 PM BST:

“It is hard to find the words to express my debt to the NHS for saving my life. The efforts of millions of people across this country to stay home are worth it. Together we will overcome this challenge, as we have overcome so many challenges in the past. #StayHomeSaveLives”

Prime Minister Johnson’s announcement and support to the NHS helped create solidarity and agreeability with the NHS which is when the #ClapForTheNHS Twitter hashtag was created. On the contrary, when Mr. Trump announced he had COVID-19 on October 3, 2020, the general public had a mixed reply, wherein some replies provided were positive and others were negative. Prime Minister Johnson’s support towards Mr. Trump showcased overt agreeability and encouraged others to do the same. However, although Prime Minister Johnson shared a message of solidarity and support for Mr. Trump, several opinion leaders, political leaders, medical professionals, and the public did not. Thus, in terms of Mr. Trump’s response on Twitter, several tweets showcased no passive and overt agreeableness.

However, Mr. Trump himself tweeted a series of tweets that showcased he, himself, agreed with his COVID-19 plan of action. Harriet Alexander from the Telegraph UK reported in “Donald Trump’s tweet storm decoded: what the 19 all-caps messages were all about” how “Donald Trump went on a 6am Twitter rant on Monday, firing off 19 tweets, mainly in capital letters, including policy proposals” (Alexander, 2020). This is important because it can showcase potential policies that Donald Trump wants to implement for the United States.
DISCUSSION

In the discussion section, I am going to discuss the results and any opportunities for future research. I found several connections to the results from the research. Letierce, J., Passant, A., & Decker, S. (2010) in *Understanding How Twitter Is Used to Spread Scientific Messages*, expands on how Twitter was ranked in the top three services utilized to spread information. Considering that these researchers are from Ireland, their geographical research location and interests demonstrate their understanding of Irish informatics and communication. President Higgins depended significantly on communication professionally and publicly utilizing the Twitter medium as a mode of communication with the public.

Further, President Higgins utilized several social media applications to help aid his tweet communication. The top mobile application that President Higgins utilized was TweetDeck. According to Twitter, TweetDeck “TweetDeck offers a more convenient Twitter experience by letting you view multiple timelines in one easy interface. It includes a host of advanced features to help get the most of Twitter: Manage multiple Twitter accounts, schedule Tweets for posting in the future, build Tweet collections, and more” (Twitter, 2020). President Higgins chose to utilize this platform over Twitter for iPad, Twitter for iPhone, or TwitterWebApp.

On the contrary, over 90% of Mr. Trump’s tweets were published via iPhone. This shows that Mr. Trump preferred quick and personal communication, as opposed to calculated and thoughtful. As Twitter is an effective platform for mass information sharing, especially for information concerning public opinions or where public opinions are given, tweeting quickly and without planning may cause both reliable and unreliable information spreading.
One of Mr. Trump’s most frequent words during the onset of coronavirus was ‘fake’, which was mentioned in the literary Twitter corpus (112) times. There are numerous news sites that spread both fake and reliable news. Due to this, it is important to examine the credibility of the information source. Mr. Trump mentioned the term ‘news’ (148) times and mentioned ‘Fox news’ specifically (112) times. Letierce, J., Passant, A., & Decker, S. (2010) argue that tweets captured particular content surrounding discourse communities. Trump’s online discourse community during COVID-19 does not center around herd immunity, country standards, or ways in which the pandemic should be handled. Mr. Trump focuses on his own personal image and portrayal in the media whereas Prime Minister Johnson did not. Instead, Prime Minister Johnson relied on purporting to uplift his fellow citizens within the community by keeping them informed whenever he gained new information.

**Figure 21**
Comparison of Overall Tweets, Retweets, and Replies of Users

![Comparison of Overall Tweets, Retweets, and Replies of Users](image)

*Figure 21*  
Comparison of Overall Tweets, Retweets, and Replies of Users
The Figure above showcases that Mr. Trump communicated the most on the social media platform Twitter during the onset of COVID-19. Mr. Trump had the most tweets, retweets, and replies. During the onset of COVID-19, his tweet production was greater than replies and retweets from President Higgins. Prime Minister Johnson tended to rely on retweets more than tweets. However, Prime Minister Johnson had more of a balance in communication than either one of the others in this analysis.

Egbert et al. (2020) argues that "Re-tweets can lead to the expansion of a tweet’s reach through the medium, so that in some cases posts of an individual who may have a small number of followers end up having a disproportionate reach and effect" (Egbert et. al, 2020). This idea about retweets shows the problems with false information and its spread across Twitter when users retweet. Egbert et al. (2020) poses the implications of scientists going viral when spreading information. Egbert criticizes scientists for a potentially "inaccurate tweet" that may end up "going viral" and cause a sense of misinformation and trust for individuals or the scientific organization (Egbert et al., 2020). In terms of the users in this particular project who are all governmental officials, the virality of a tweet can have the same effect, if not more damaging, than the scientists. As a result of the natural platform and position that government figures have, retweets and agreeability of content from the general public pose serious problems in a time of crisis.

Rufai and Bunce (2020) argue that "the communication and language used by world leaders can influence the opinions and behaviour of the public” (p.3). Mr. Trump had the most retweets when the data was analyzed, which presents an idea of a greater flow of information on
his account, as well as a larger chance of spreading misinformation. Brandt and Botelho (2020) argue how “this language creates a public health discourse that seems reactive rather than proactive, reductive rather than holistic, disempowering rather than empowering” (Brandt & Botelho). Thus, the language must be able to connect with those who are reading and engaging with it, but still accurately expressing what is occurring. The language surrounding COVID-19 is important because of the pandemic’s evolving nature. The language in any discourse the community needs is to be inclusive enough to be able to capture the essence of what is occurring, but it must also accurately reflect scientific developments.

Compared to Mr. Trump and Prime Minister Johnson, President Higgins had the lowest amount of retweets. Retweeting may serve as a benefit if the users are being informed with accurate information alongside with scientific data to support the claims about which the users are tweeting. A way to ensure that information is being included that is scientifically accurate is to include scientific data from the WHO, the CDC, etc. According to my previous research conducted in my skills essay, data from the WHO and the CDC was considered. When assessing the data, I found that discussions around COVID-19 to be communicated more scientifically as opposed to the text being created for a public audience.

The communication about COVID-19 that is presented in articles about the WHO showcase the pandemic as a "global emergency" and called on countries to take action. According to Cucinotta and Camellia (2020), the WHO was "deeply concerned both by the alarming levels of the spread in severity and by the alarming levels of in action" and wanted the countries to take action (p. 157). This shows how the WHO wanted countries to take action.
Mr. Trump did not want to fully take action in early March 2020 when this was urged by the WHO. Additionally, the BBC News published an article on April 15, 2020 that the United States would halt funding to the WHO and this was reiterated during a speech at the news conference at the White House on Tuesday April 7, 2020 ("BBC World News," 2020). BBC News shared that during the news conference that Trump stated the following: "I am directing my administration to halt funding while a review is conducted to assess the World Health Organization's role in severely mismanaging and covering up the spread of the coronavirus" ("BBC World News," 2020).

The decision to not follow the WHO's recommendation to deal with COVID-19 early, as well as the decision to stop funding, shows that Mr. Trump had difficulty accepting the advice from a credible organization as to how he ought to lead the United States. Cucinotta and Camellia (2020) also advocated for COVID-19 awareness recommendations alongside the WHO's whose current recommendations reflect that “people with mild respiratory symptoms should be encouraged to isolate themselves, and social distancing is emphasized and these recommendations apply even to countries with no reported cases” (p. 157). Thus, the WHO's findings and views are reflected in both academic journal articles and news articles.

Likewise, the CDC also appeared to have a presence in the media during the time of COVID-19. Also, research reported about the 2009 Swine Flu Pandemic reflected that content from the CDC appeared on Twitter. Specifically, Szomszor et al. (2011) expressed that “both WHO and CDC also have articles that appear in Twitter (CDC arriving much sooner than WHO), but their uptake is relatively small compared to the BBC and CNN articles” (p. 322). The
inclusion of scientific data and information on public-facing social media sites show the intersectionality between public involvement and private engagement.

The themes that the users focused on in their tweets were similar. At the onset of COVID-19, the tweets were focused on ways to mitigate COVID-19. Wang et al. (2020) in “Survival-Convolution Models for Predicting COVID-19 Cases and Assessing Effects of Mitigation Strategies” expanded on how countries adapted and have been trying their best to accommodate the changing circumstances of COVID-19. The effectiveness of the mitigating strategies were examined to see how countries would manage COVID-19 and the information that they communicated during this time. According to the authors, the governments put different parameters in place and began to examine key statistics that affected COVID-19 factors. The article took "account for transmission during a pre-symptomatic incubation period and used a time-varying effective reproduction number (Rt) to reflect the temporal trend of transmission and change in response to a public health intervention" (Wang et al, 2020). This is important when examining the public health response when exploring COVID-19.

Also, the authors looked at how well different communities were managing the pandemic and communicating relevant information to their citizens. The data looked into how the issue was managed as a global pandemic and also how COVID-19 was considered a global pandemic in addition to a public health emergency. The article explored the trends after May 1 and considered whether or not the pandemic slowed or became controlled.

The article highlights specific dates in which the pandemic was 'controlled' and the trends to illustrate this. The article focalized results of the survival-convolution model and also expanded on the mitigating measurements as well as the predictions for the future. As a major
global pandemic, COVID-19 caused severe social and economic damage for numerous countries, in particular the United States. This article would be useful when exploring how the outbreak was controlled in China, South Korea, South America in relationship to the United States, the United Kingdom, and Ireland. The authors explored COVID-19 and its spread utilizing a particular model to simulate models to see what the next coming months would hold in store. According to the authors, "A recent study considered the disease incubation period and used a convolution model based on SEIR". This is important to utilize in a dissertation project because it can provide a model to explore and use when setting up a study over COVID-19 exploring Twitter.

Further, the article stated that "a state-space susceptible-infectious-recovered (SIR) model with time-varying transmission rate was developed to account for interventions and quarantines" (Wang et al, 2020). A time-varying transmission would be valuable because we are able to measure whether the pandemic got better, the numbers of total deaths, and how long it took to get to one particular result. This can also help for a project utilizing Twitter because the time element is included and I am able to examine each tweet relative to the information mentioned. The article examines "a parsimonious and robust population-level survival-convolution 71 model that is based on main characteristics of COVID-19 epidemic and observed number of 72 confirmed cases to predict disease course and assess public health intervention effect" (Wang et al., 2020). This is significant because I am able to review key statistics such as new cases that develop, which can help to predict daily new confirmed cases. When we are able to consider new confirmed cases, we are able to assess different elements, such as the peak date and the final total
number of cases on behalf of the interventions across the different countries along with the mitigation measures.

In a 2018 study, Tang et. al (2020) found that dealing with the outbreaks of infectious diseases such as the Swine Flu, Ebola Virus, and H7N9 caused users to focus on family, freedom, and information seeking. Tang et. al (2020) expressed that in their Twitter analysis during this timeframe, they “coded 12 coping strategies: self-reliance, support seeking, problem solving, information seeking, accommodation, negotiation, delegation, isolation, helplessness, escape, submission, and oppression” (Tang et al., 2018, p. 965). These strategies that the researchers coded after examining the tweets of the public reflected the public’s concerns.

On the contrary, when a close-reading was conducted on the tweets of the Twitter users for this project, President Higgins, Prime Minister Johnson, and Mr. Trump's tweet did not reflect any of these themes at the onset on COVID-19. This shows that the public's concern and the government's concerns may overlap, however, the way that these concerns are publicly narrated on social media may present differently. Similarly, Brandt and Botelho (2020) include data from previous pandemics before COVID-19 such as the global AIDS crisis, H1N1 influenza, Ebola, Zika, etc. The article highlights how global epidemics were expected and how their particular harm was anticipated (Brandt and Botelho, p.1494). However, it was important for the political leaders to understand how COVID-19 may have been both similar or differed from other "past zoonotic outbreaks". Currently, the development of policies post-COVID-19 are being developed further by Prime Minister Johnson in the United Kingdom and potentially discussed by Donald Trump.
Conclusion

In the conclusion section, I am going to reflect on the main points in my dissertation. Rufai and Bunce (2020) argue that "Twitter may represent a powerful tool for world leaders to rapidly communicate public health information" and this could cause political figures to use these tools in the future (Rufai and Bunce, p. 1). In this dissertation, I have utilized the tweets, retweets, and replies of President Higgins, Mr. Trump, and Prime Minister Johnson. I have facilitated a close-reading analysis as well as a metadata analysis with the data extracted from their tweets.

From their tweets, I have been able to draw the conclusion that communication was vastly prominent when discussing COVID-19 in the earlier stages of its development. Further research would include looking more into months after the onset of COVID-19 and learning how it developed on social media platforms after May 30, 2020. Research in this area of my dissertation has opened up the path to discuss COVID-19 and the use of visual rhetoric, as well as how scientific communication can be compared to public-facing texts. Visual rhetoric is helpful because in general, “rhetoric has come to be used not just as means of producing effective communications, but also as a way of understanding communication” (Selzer, p. 280).

The argument has been made that the governmental systems and leaders utilized Twitter to promote their personal views on and experiences with COVID-19, in addition to implementation strategies on how to deal with the pandemic, how to safely engage with others, and the rules for future public engagement. According to an article in the New England Journal of Medicine, “Ultimately, the IOM recommended four areas of investment to prepare for future pandemics: core U.S. public health infrastructure, infectious disease research and epidemic
surveillance training, vaccine and drug development, and public education and behavioral change” (Brandt and Botelho, 2020, p. 1494). Thus, the analysis was conclusive that platforms such as Twitter were utilized to position opinions, facts, policies, and procedures regarding COVID-19, and future implications of how a pandemic can be handled are presented. Further, future implications can include looking and examining patient narratives, life writing, and other information to gain insight on COVID-19 and how it affects different communities. This is important because it will be able to showcase the engagement of the NHS, health care workers, and patients with COVID-19. This research could also show how COVID-19 has affected communities not only from a political stance, but also from a social stance.
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Figure 1

Sequence of the experimental task. The top row shows the double-target condition. The bottom row shows the single-target condition. (a) First, participants move the cursor to the start position. (b) After the presentation of the time constraint indicator, (c) the potential targets are presented. (d) 450-1000 ms later, participants were required to start the movement after the sound stimulus. After the movement onset, the gray area of the indicator reduces linearly with time. (e) When the participant's movement onset is detected, the final target is presented. (f) The stimulus disappeared 1000 ms after the movement onset. Participants acquired 100 points if they met the movement onset criteria and passed the final target within the time constraint assigned to the final target. (g) Feedback on successes, failures, and scores was provided after each movement.
Movement trajectories according to combinations of the time constraints. The movement trajectories according to the time constraint of all participants in the double-target condition are shown. The color is based on the final target (red: final target is left, blue: final target is right). This figure confirmed that the trajectories of the participants' movements are modulated according to the combination of time constraints. For combinations of equivalent time constraints, the trajectories seemed to be bilaterally symmetrical. On the other hand, in situations with different time constraints, the frequency of the initial movement to the target with shorter time constraints seemed to be higher.
Figure 3

Bivariate histograms of the initial movement direction (IMD) and the initial movement velocity (IMV) according to the combinations of the time constraints. The bivariate histograms of the IMD and the IMV according to the time constraint in the double-target condition are shown. The center of each box shows the bivariate histogram, and the upper right corner shows the same histogram viewed from the vertical direction. As in Fig 2, this Figure shows the change in the direction and velocity of the initial movement depending on the time constraint. In particular, the diagonal line from the upper left to the lower right shows a high frequency of initial movement in the center direction and a symmetrical distribution along 90° of the IMD. On the other hand, in the conditions where the difference in time constraints is large (lower left or upper right panel), the frequency of the initial movement in the target direction with tighter time constraints is high, although initial movement in the center direction also exists.
Clustering of the initial movement and the probability of appearance of movement patterns according to time constraints. The upper left panel shows a scatter plot of the movement direction and velocity of the initial movement, including data from all participants. The data were classified into three clusters (red, green, and blue) by K-means clustering for the bivariate initial movement variables (i.e., the IMD and IMV). The upper right panel shows the between-participant mean of the probability of occurrence of each cluster under all time constraints. Error bars are between-participant standard deviations. The bottom panels show the between-participant average of the probability of occurrence of each cluster, depending on the time constraint. This figure shows that when the time constraints are equal, the occurrence probability of the intermediate direction (green) is higher, and with differences in the time constraints, the occurrence probability of the initial movement to the target direction (red and green) with a shorter time constraint is higher.

Figure 4
Figure 5

Comparison of the initial movement behavior among conditions. The upper, middle, and lower panels show inter-condition comparisons of the IMD, IMV, and |IMD|, respectively. The circles and error bars show the means and standard deviations, respectively. The black-colored circles show the data for the single-target condition, and gradient circles from red to yellow show the data for the double-target condition. The color changes from red to yellow depending on the severity of the time constraint of the other target (red is tight, yellow is loose). The left and right panels are drawn as a function of the time constraints of the left and right targets, respectively. These panels show the modulation of the initial movement depending on time constraints.
Comparison of performance (temporal accuracy, arrival target accuracy, overall performance) among conditions. The upper, middle, and lower panels show inter-condition comparisons of the temporal accuracy, arrival target accuracy, and overall performance, respectively. The circles and error bars show the mean and standard deviation, respectively. The gray-colored circles show the data for the single-target condition. The black-colored circles show the estimated performance of predeterminant strategy based on the data in the single-target condition. The gradient circles from red to yellow show the data for the double-target condition. The color changes from red to yellow, depending on the severity of the time constraint of the other target (red is tight, yellow is loose). The left and right panels are drawn as a function of the time constraints of the left and right targets, respectively. The temporal accuracy in the double-target condition is significantly less than that in the single-target condition, and the arrival target accuracy in the double-target condition is significantly higher than the performance of predeterminant strategy estimated from the data of the single-target condition (black-colored circles and lines).
Additionally, the overall performance in tight time-constraint condition (red circles and lines in both right and left panels) was significantly less than the performance of the predeterminant strategy (black-colored circles and lines). This deficit in performance may be due to excessive preference for the choice reaction even in the tight time-constraint conditions.

Supplementary Files

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