

# Communication, Leadership, and Gender During the COVID-19 Pandemic

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## Abstract

The COVID-19 pandemic has put a spotlight on world leaders. Throughout the crisis, it has been clear that world leaders have used different communication strategies that not only has shaped public health but also public trust. However, it is not clear if there are differences in rhetoric or priorities between male and female leaders. To explore leaders' communication through the lens of gender, I use a corpus consisting of 122 public speeches and statements made by heads of government in 20 countries around the world at the outset of the COVID-19 pandemic. Using a seeded-LDA, I find that on average, women leaders tended to highlight the need for cooperation and social welfare more often than their male counterparts. In contrast, many male leaders made use of war-related emotional appeals to inspire a sense of urgency while also displaying a sense of nationalism in their speeches. While the analysis does not account for the leaders' context and culture, it does show how to quantitatively measure differences in political discourse across countries in times of crisis.

Keywords: gender, leadership, communication, pandemic.

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## 1. Introduction

The COVID-19 pandemic has put a spotlight on world leaders. Across countries, heads of government have had their words and actions scrutinized as they figure out how to deal with the effects of the pandemic. Throughout the crisis, it has been clear that world leaders have used different communication strategies that not only has influenced public health but also public trust. In a world where female leaders have started to emerge, it is important to understand if and how these differences are driven by gender.

This project answers the following question: *Are there differences in rhetoric or priorities in the speeches of men and women leaders when responding to the COVID-19 pandemic?* To answer this question, this project builds upon the hand-coded analytical study by Dada et al. (2021) using a quantitative approach. The corpus for this task consists of 122 public speeches and statements made by heads of government in 20 countries around the world at the beginning of the COVID-19 pandemic.

The methodology used in this project consists of two parts. First, I make use of Martindale's Regressive

Imagery Dictionary to see compare primordial and conceptual thinking between male and female leaders. This method did not show any significant differences between genders, but it did suggest that it might be relevant to use a more context-specific dictionary. The second part addresses this issue by using seeded-LDA. This approach consists of predicting topics in documents by using a set of prescribed topics. The seeded-LDA corroborated some of the results in Dada et al. (2021) quantitatively. It was found that, on average, women leaders tended to highlight the need for cooperation and social welfare. In contrast, many male leaders made use of war-related emotional appeals to inspire a sense of urgency.

While this study does not intend to determine whether male or female politicians were more effective in the outset of the COVID-19 virus, it does shed light into their communication strategy at the beginning of this crisis and paves the way for further research that seek to investigate quantitatively the similarities and differences in male and female discourse in times of crisis.

## 2. Motivation

In times of crisis, people look up to their leaders for guidance (Leschke-Kahle 2020; Bartsch et al. 2020). The COVID-19 pandemic has been an exemplary case of the influence that political leaders have in such times. Throughout the pandemic, their communication has shaped citizens' perception of the virus and adherence to the restrictions (Al-Hasan, Yim, and Khuntia 2020). In Brazil, for example, a study has shown that, after the president's public dismissal of the risks associated with the virus, the social distancing measures taken in pro-government municipalities weakened (Ajzenman, Cavalcanti, and Da Mata 2020). In another study, focused on the United States, Kuwait, and South Korea, researchers found that a positive perception of the government's efforts to control the outbreak led to better adherence of social distancing measures (Al-Hasan, Yim, and Khuntia 2020).

During the pandemic, there has been a special focus on how female leaders have communicated throughout and handled the crisis (Aldrich and Lotito 2020; Garikipati and Kambhampati 2020). We have seen the media praising the perceived gender-related strategies to tackle the pandemic (Jon and Roy 2020; Windsor et al. 2020). Nonetheless, there is a limited number of studies assessing whether male and female leaders communicate differently in times of crises. A recent study starts exploring this issue by providing insight into the type of language and rhetorical tools used by different heads of government during the COVID-19 pandemic (Dada et al. 2021). In this study, the researchers use an inductive analytical approach to code speeches based on themes and content. Dada et al. (2021) find that women spoke more frequently about the individual effects of the pandemic and social welfare. Moreover, they also found that while almost all leaders in the sample used war metaphors to describe the response to the virus, men used them with greater volume and frequency.

At a time when female leadership is becoming more common, it is relevant to understand if there are distinct communication strategies between political leaders across gender. This project contributes to the literature by exploring quantitatively whether there are language or rhetorical differences in how male and female leaders

communicate in times of crisis. Exploring how leaders communicate during COVID-19 could later serve as a point of departure for how political discourse impacts economic and social recovery after a pandemic.

## 3. Corpus

### 3.1 Data Collection

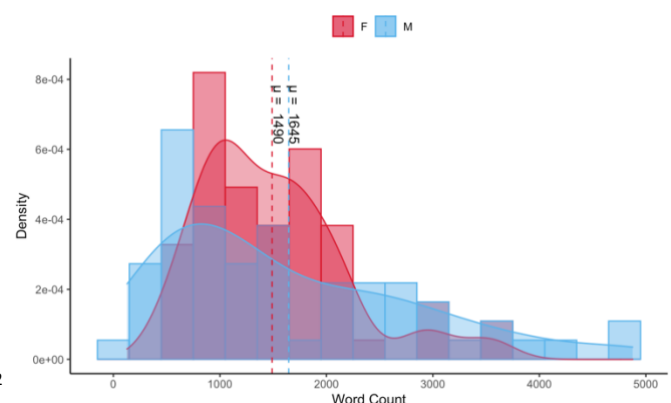
In this study I set out to analyse the same corpus used in Dada et al. (2021). In their study, the researchers collected national addresses, statements, or speeches of any head of government whose country met the following criteria: (i) Member of the United Nations Security Council (UNSC), (ii) part of the five major emerging economies (BRICS), (iii) a woman is the head of government. If a country met the criteria but was excluded, there were no public statements or not enough statements available. Moreover, they also restricted the timeframe to February 26<sup>th</sup>, 2020 to April 6<sup>th</sup>, 2020 in order to capture leaders' reactions to the beginning of the COVID-19 pandemic. The data was provided to me via NVivo, and I manually exported it into a CSV file to analyse it.

### 3.2 Summary Statistics

The resulting corpus consists of 122 speeches across 20 different countries. The set of countries includes 10 female leaders and 10 male leaders. Also, 61 of the speeches were delivered by women and 61 were delivered by men. Table 1 shows the final set of countries and the number of speeches corresponding to each head of government.

In Figure 1, one can see the distribution of speech lengths across gender. Although there is a wider length range across speeches made by males (129-4875 words) compared to females (454- 3559 words), we see that, on average, speeches made by female leaders had 1300 words, whereas those by male leaders were 1730 words long.

**Figure 1: Speech Lengths Across Gender**



**Table 1: Corpus Summary**

Country	Leader	Gender	Region	Rationale for Inclusion	No. of Speeches
<b>Bangladesh</b>	Hasina	Woman	Asia	Woman	1
<b>Belgium</b>	Wilmes	Woman	Europe	UNSC, Woman	3
<b>Bolivia</b>	Añez	Woman	South America	Woman	7
<b>Brazil</b>	Bolsonaro	Man	South America	BRICS	4
<b>Dominican Republic</b>	Medina	Man	Caribbean	UNSC	2
<b>Finland</b>	Marin	Woman	Europe	Woman	3
<b>France</b>	Macron	Man	Europe	UNSC	2
<b>Germany</b>	Merkel	Woman	Europe	UNSC, Woman	4
<b>India</b>	Modi	Man	Asia	BRICS	4
<b>Indonesia</b>	Widodo	Man	Asia	UNSC	5
<b>New Zealand</b>	Arden	Woman	Oceania	Woman	3
<b>Niger</b>	Issoufou	Man	Africa	UNSC	2
<b>Norway</b>	Solberg	Woman	Europe	Woman	12
<b>Russia</b>	Putin	Man	Europe/Asia	BRICS, UNSC	2
<b>Scotland</b>	Sturgeon	Woman	Europe	Woman	14
<b>South Africa</b>	Ramaphosa	Man	Africa	BRICS, UNSC	3
<b>Sint Maarten</b>	Jacobs	Woman	Caribbean	Woman	12
<b>Taiwan</b>	Ing-wen	Woman	Asia	Woman	2
<b>UK</b>	Johnson	Man	Europe	UNSC	12
<b>USA</b>	Trump	Man	North America	UNSC	25

**Table 2: Lexical Diversity**

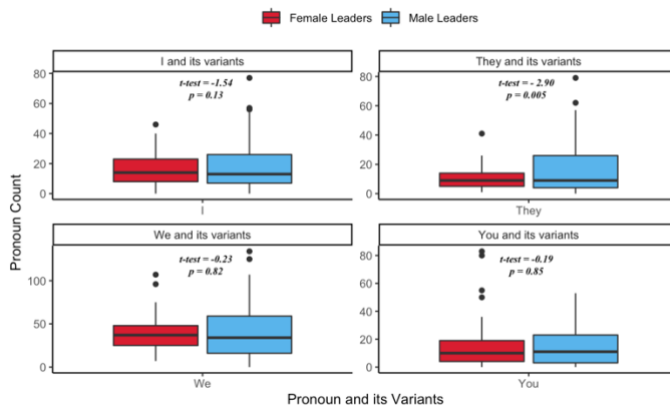
Index	Female Leaders	Male Leaders
<i>TTR</i>	0.604	0.629
<i>Maas</i>	0.169	0.163

In terms of lexical diversity, I make use of the type-token ratio (TTR), which measures the ratio between the number of total unique words to the number of words in each text, and the Maas index, a similar metric that incorporates text length. It should be highlighted that, usually, as a lexical diversity index's value increases, the lexical richness also increases, except in the case of Mass where the reverse is true. Table 2 shows the mean results of the TTR and Maas Index for our sampled speeches across genders. We observe that, even after accounting for speech length using the Maas Index, male leaders have a higher score for lexical diversity. Nonetheless, these differences are statistically insignificant at the 5% level for both the TTR ( $p = 0.12$ ) and the Maas index ( $p = 0.07$ ).

Another important feature that is worth looking into is the use of personal pronouns across speeches. As written by Lenard (2016), "personal pronouns are crucial for the analysis of political speeches because they give a sense of whom a speaker identifies himself/herself with". Many studies have found that women tend to use personal pronouns more often than men (Precht et al. 1998; Koppel, Argamon, and Shimon 2002). However,

as shown in Figure 2, the only significant difference observed in our corpus is found when comparing the use of *they* across male and female leaders. Looking closer into this difference, I found that the use of the pronoun *they* is used similarly across leaders and it tends to be associated with the appraisal of frontline workers, the COVID-19 restrictions, and the care of the elderly.

**Figure 2: Personal Pronouns Use in the Corpus**



## 4. Methods

### 4.1 Regressive Imagery Dictionary

Imagery is conceptualized as the extent to which a word “arouses a sensory experience such as a mental picture or sound” (Friendly et al. 1982). Image-based words evoke sensory experiences whereas concept-based words and emotion-based words appeal to listeners’ logical interpretations and emotions respectively (Emrich et al. 2001). Looking into the literature studying leadership and communication, one finds that a leader’s ability to persuade people rests on “her ability to convey images with words” (Emrich et al. 2001; Naidoo and Lord 2008). Using Martindale’s Regressive Imagery Dictionary (RID), Emrich et al. (2001) found that U.S. presidents who used imaged-based rhetoric in their speeches were considered to be more charismatic and better communicators.

In times of crisis, it is important for political leaders to guide citizens and communicate their vision for a resolution. Thus, I investigate the rhetorical differences across genders in our sample using Martindale’s RID

(Martindale 1975). To do so, I first create a document-feature matrix (dfm) in which each speech is grouped by its corresponding head of government. In the dfm, I remove numbers, stop words, and punctuation, as they are not relevant for analysis. Then, I weight the dfm so that instead of having the number of occurrences a word appears, we have the relative frequency of each word. This is done to account for speech length difference between genders. Finally, before applying the RID dictionary, I created 3 sub-dictionaries, one based on images, another one based on emotion, and the third one based on concepts.

### 4.2 Seeded LDA

It is rare to find in the quantitative text analysis literature an ideological comparison amongst world leaders. Most methodologies focus on extracting policy positions or classifying politicians when all of them belong to the same political system (Schonhardt-Bailey 2008; Savoy 2015; Laver, Benoit, and Garry 2003). In Dada et al. (2021) the heads of government in the sample are from a wide range of countries and political systems, however, it was possible to identify five major themes using a hand-coded approach<sup>1</sup>.

A popular approach to understand themes quantitatively in a set of documents is topic models, among which we find Latent Dirichlet Allocation (LDA). LDA replaces the handcoding of texts with a “three-level hierarchical Bayesian model, in which each item of a collection is modeled as a finite mixture over an underlying set of topics” (Blei, Ng, and Jordan 2003). However, the unsupervised nature of LDA leads to topics that are neither meaningful nor relevant for the task at hand (Chang et al. 2009). Indeed, when applying LDA to the corpus in Dada et al. (2021) it was not possible to find a collection of words that made up a clear topic.

To address this issue, one can incorporate lexical priors into topic models. In other words, with little effort, the researcher can provide a set of *seed words* that she believes are representative of the topics of the underlying corpus (Jagarlamudi, Iii, and Udupa 2012). This approach is particularly helpful considering there

<sup>1</sup> The themes were: the economy and financial relief, social welfare and vulnerable populations, nationalism, responsibility and paternalism, and emotional appeals.

are speech excerpts illustrating such potential topics in Dada et al. (2021). Using these excerpts, I created the following dictionary of “seed” words.

**Table 3: Dictionary of Seed Words**

<b>Cooperation</b>	international cooperation, cooperation, solidarity, help
<b>Economy</b>	bankruptcy, econom*, market*, money, bank*, stock*, bond*, industry, company, shop*, unemploy*, furlough
<b>Emotional Appeals (War)</b>	war*, battle*, fight, enem*
<b>Nationalism</b>	self-reliant, nation*, proud, foreign country, independent,
<b>Social Welfare</b>	alcohol*, welfare, domestic violence, violence, mental health, vulnerable, pregnant, elder*

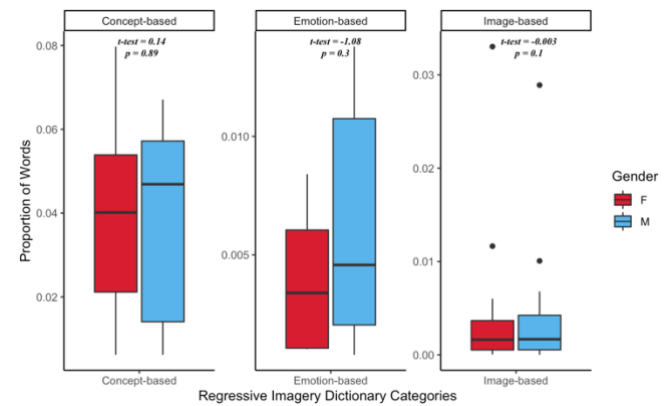
It is relevant to mention that to apply the seeded LDA, the document-feature-matrix needs to be pre-processed correctly. This includes making sure that all characters are in lower-case; removing numbers, punctuation, and stop words; stemming, to ensure that we are using the root of the word that is part of the seed; enable the consideration of bigrams, to make sure that we consider collocations; and padding to prevent the formation of non-sense bigrams.

## 5. Results

### 5.1 Regressive Imagery Dictionary

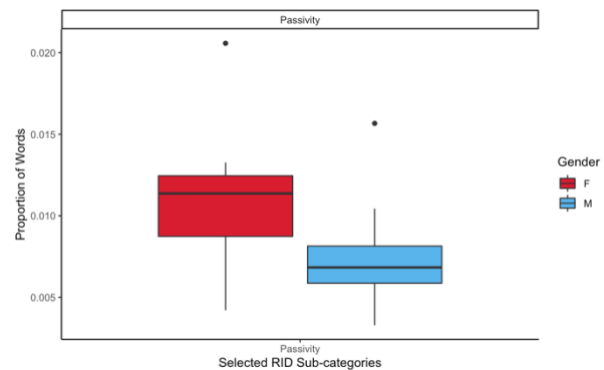
After applying the dictionary to the dfm described in section 4.1, I found that there were no significant rhetorical differences between the speeches of male and female leaders (Figure 3). However, what is surprising is that the heads of government in our sample tend to use concept-based words more often than image-based words. One could assume that this is the case because most of their speeches are based on explaining citizens how they intend to tackle the pandemic, which entails giving orders and direction instead of explaining a vision.

**Figure 3: Results of RID Across Gender**



Even though there were no differences across genders in the RID’s three major categories, looking closer into each subcategory revealed an interesting distinction. The only subcategory that was significant at the 10% level was *passivity* ( $p=0.06$ ). This subcategory includes words such as “safe”, “safely”, “bed”, “die”. As shown in Figure 4, women used more words related to passivity. However, the difference was mainly driven by the word “safe”, as women used it 1.45 times more often than men.

**Figure 4: Use of Passivity-related among leaders**



### 5.2 Seeded LDA

Once the dictionary of “seed” words is created, one can apply LDA to the corpus. In this case, the number of topics is determined by the number of keys in the dictionary. In Table 4, shows how the seeded LDA also identifies words that are relevant to the pre-specified topics.



**Table 4: Seeded-LDA Word Suggestions**

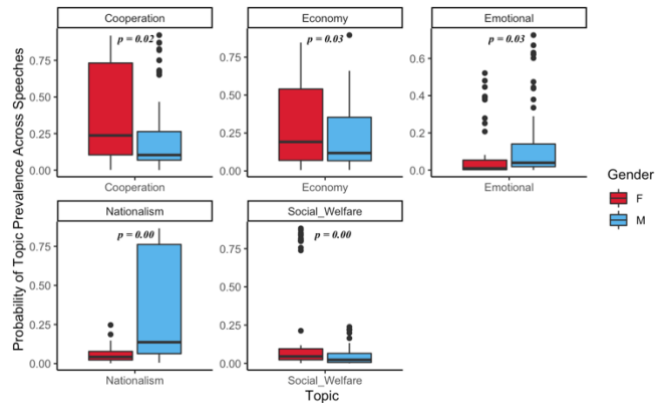
<b>Cooperation</b>	care, support, need, time, work
<b>Economy</b>	econom* difficulti*, econom* relief, econom* impact, econom* active*, unemploy* benefit*
<b>Emotional Appeals (War)</b>	warrior, war_two, war_effort, wartime, war_wound
<b>Nationalism</b>	nation* emerg*, nation* effort, nation* secur*, nation* guard
<b>Social Welfare</b>	elder neighbor, alcohol issu*, alcohol misuse, service, health

The output of the seeded LDA is similar to that of the standard one. We end up with a theta and a phi matrix. The former has rows representing the distribution of topics over documents, while the latter has rows representing a distribution of words over topics (Jones 2019). For the purposes of this study, we are only concerned with the theta matrix. In this matrix, we can observe the probability that certain speech contains words corresponding to a given topic. I average these probabilities over each world leader to observe the expected topic prevalence across speeches.

As shown in Figure 5, the most prevalent topic was the economy, as 10 out of the 20 leaders were more prone to bringing it up throughout their speeches. Interestingly, the second most common topic was emotional appeals, which was brought up by male and female leaders alike. In this context, emotional appeals are defined as in Dada et al. (2021), where they refer to the use of war analogies as a rhetorical tool.

**Figure 5: Seeded-LDA Results by Leader**

Another relevant observation is that no other head of government in the sample can compare to President Trump when it comes to nationalist rhetoric. Across his speeches, there was a 79% chance that his speeches contained words linked to such rhetoric. Similarly, no one seem to be more concerned about vulnerable populations and social welfare than Prime Minister Jacobs. Across her speeches, there was an 81% probability that she used words addressing her concerns about the topic.

**Figure 6: Seeded-LDA Results Across Gender**

In contrast to the RID, using a seeded LDA did show marked distinctions between genders. As shown in Figure 6, if we compare the average prevalence of a given topic between men's and women's speeches, we see that the difference between them is significant across all topics. In our sample data, women leaders were more likely to talk about cooperation ( $p = 0.02$ ), the economy ( $p = 0.03$ ), and welfare ( $p = 0.00$ ) than men, whereas men leaders were more likely to talk about nationalism ( $p = 0.00$ ) or bring up war references with an emotional appeal ( $p = 0.03$ ).

These findings seem to be consistent with those in Dada et al. (2021) but closer examination is required. In the study, they found that both men and women made references to social welfare, but that women leaders “dove to a deeper level [...], in particular related to the vulnerable and the need for social support”. Nonetheless, looking at this issue quantitatively, it is not clear whether this difference is driven by a couple of speeches that were outliers.

Moreover, their results emphasize that both men and women made an equal number of references about the

devastating effects of the pandemic on the economy. However, they argue, men would tend to focus on large corporations while women would talk more about small businesses (Dada et al. 2021). This difference in how the talked about the economic crisis could imply that women leaders, with their microeconomic approach, might have used a larger set of terms than the men concerned with the macroeconomy. In other words, the results we observe showing that women made more references about the economy might be because they were concerned with a larger set of small players.

In addition, it was also observed by Dada et al. (2021) that, even though both male and female leaders used war analogies and metaphors, “the frequency and aggression of [war] analogies seems to be stronger with the men”. Quantitatively, we can see that this was the case as the probability that men’s speeches used contained war references was 14.5%, on average, whereas women’s was 7.6%.

When it came to cooperation, Dada et al. (2021) also noticed that “even among the men who discuss global cooperation, they discussed it far less [than women]”. This observation is corroborated by the seeded LDA given that, on average, there was a 35.5% chance that women’s speeches contained words related to cooperation whereas for men it was only 23.5%.

Finally, making drawing conclusions about nationalistic rhetoric requires closer examination. According to Figure 6, men were far more likely to use it than women. However, it is important to take into consideration that 25 out of the 61 speeches made by male leaders in our corpus belong to President Trump. As shown in Figure 5, his speeches were, by far, more likely to incorporate nationalistic rhetoric than any other leader.

## 6. Conclusion

While this study did not intend to determine whether male or female politicians were more effective in the outset of the COVID-19 virus, it did shed light into their communication strategy at the beginning of this crisis. The more interesting contrasts were found when using a seeded-LDA to identify topic prevalence. On average, women leaders tended to emphasize the need for

cooperation and social welfare more often than male leaders. In contrast, many male leaders made use of war-related emotional appeals to inspire a sense of urgency. In a similar vein, they also brought to life a sense of nationalism at the time of the shock.

Another relevant finding of this project was that using of the RID to compare primordial vs. conceptual thinking between men and women did not yield significant results. In other words, in this study, men and women did not use practical or abstract words differently across speeches. This finding may suggest that it could be relevant to use context-specific dictionaries to better understand differences in speech.

In an increasingly globalized world where leaders’ decisions have repercussions outside of their territory, it is important to understand the different communication strategies that leaders use in times of crisis. Although it is uncommon in the literature, this study explores quantitatively, and through the lens of gender, how world leaders have used different the different rhetorical tools at the beginning of a pandemic. This approach might, as a result, be the starting point of more robust studies investigating the similarities and differences in male and female discourse in times of crisis.

## 7. Acknowledgements

I would like to thank Sara Dada and her team for their willingness to share the corpus data with me. Their study titled *Words Matter: Political and Gender Analysis of Speeches Made by Heads of Government During the COVID-19 Pandemic* served as the starting point of this project.

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