ANALYZING THE GLOBAL DIFFUSION OF THE #METOO MOVEMENT USING TWITTER DATA

by

Sharoni Mitra

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| Approved by: |
|--------------------|
| Dr. Vaughn Schmutz |
| Dr. Yang Cao |
| |

Dr. Scott T Fitzgerald

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ABSTRACT

SHARONI MITRA. Analyzing the Global Diffusion of the #Metoo Movement using Twitter Data. (Under the direction of DR. VAUGHN SCHMUTZ)

The #metoo movement started in the United States but has spread across the world with the goal of increasing awareness about the sexual harassment women endure. This paper aims to understand the factors affecting the diffusion of the #metoo movement, which has led some countries to change their laws as it has spread internationally. Given its influence, it is imperative to understand the relationship between country characteristics, such as gender inequality, degree of internet censorship, and position in world society, and the involvement of a country's residents in the movement. The data was gathered using Twitter API to document the number of #metoo Tweets that originated from many different countries. Python was used to clean and structure the dataset. Data on countrylevel characteristics was gathered from multiple sources and linked to the Twitter data to create a unique dataset. Descriptive analyses indicate that the #metoo movement was modified by various countries to make it more relatable to local experiences and match the native language. Although the United States dominated the movement, the movement has become more global with the participation of an increasing number of countries, especially since 2019. Regression analysis indicates that higher gender inequality and higher GDP per capita are positively associated with the number of Tweets originating from a country, while lower numbers of international non-governmental organizations (INGOs) and women's INGOs (WINGOs) are associated with fewer Tweets originating from a country. These findings are generally consistent with world society theory expectations and open new avenues for using social media data to analyze digital

movements. Building on and extending existing theories, the results have implications for research that could use online social activism to map and better understand global citizenship.

DEDICATION

I would like to dedicate this thesis to all the women who have shown courage and strength in this adverse world and spoken out against the brutality they constantly face. Also, a special mention to my parents, Shantanu and Sahana Mitra, who have supported me and helped me achieve all my dreams. My brother, Siddhanth, without whose love and encouragement, I would not be here. My nani (grandmother), Purobi Banerjee, who is not only my favorite teacher, but took out time and effort to teach me the importance of life and thank you nani for all the corrections. Also, extremely grateful to Shubhankar, who has stood by me during the hardest of times. Finally, would like to thank Sayudh, who helped me with coding. And at the very end I am blessed to have friends who have supported me and kept my spirts high always.

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TABLE OF CONTENTS

| LIST OF TABLESix |
|--|
| LIST OF FIGURESx |
| CHAPTER 1: INTRODUCTION |
| CHAPTER 2: LITERATURE REVIEW |
| 2.1 Background of the Movement |
| 2.2 Structural Position and Cultural Standing of Women |
| 2.3 Internet Availability and Accessibility |
| 2.4 World Society Theory |
| CHAPTER 3: METHODS |
| 3.1 Data Set |
| 3.2 Dependent Variables |
| 3.2.1 Volume of Tweets per Country |
| 3.3 Independent Variables |
| 3.3.1 Structural and Cultural standing of a Women: Gender Inequality Index 12 |
| 3.3.2 Structural and Cultural standing of a Women: Social Institution and Gender Index |
| 3.3.3 Control and Suppression of Internet Usage: Freedom on the Net 13 |
| 3.3.4 Links to World Society: International Non-Governmental Organizations (INGO) |
| 3.3.5 Links to World Society: Women's International Non-Governmental Organizations |
| 3.4 Control Variables |
| 3.4.1 Gross Domestic Product Per Capita |

| 3.4.2 Social Progress Imperative | 15 |
|--|-----|
| 3.4.3 Total Population | 15 |
| 3.4.4 Overall Twitter Activity | 16 |
| 3.5 Analysis Plan | .16 |
| CHAPTER 4: RESULTS | 20 |
| 4.1 Descriptive Statistics | .20 |
| 4.2 Multiple Linear Regression Analysis | .28 |
| CHAPTER 5: DISCUSSION | 31 |
| CHAPTER 6: CONCLUSION | 35 |
| 6.1 Future Research | .37 |
| 6.2 Notes | .37 |
| REFERENCES | 38 |
| APPENDIX A: NUMBER OF MISSING VALUES FOR INDEPENDENT VARIABLES | 45 |
| APPENDIX B: TABLE: DESCRIPTIVE STATISTICS FOR INDEPENDENT | |
| VARIABLES BEFORE IMPUTATION | .46 |
| APPENDIX C: DESCRIPTIVE STATISTICS FOR INDEPENDENT VARIABLES AFTER IMPUTATION | 47 |
| APPENDIX D: CORRELATION ANALYSIS FOR INDEPENDENT VARIABLES | 48 |
| APPENDIX E: ADDITIONAL ANALYSIS MODEL: NEGATIVE BINOMIAL MODEL | 49 |
| APPENDIX F: ADDITIONAL ANALYSIS MODEL: MULTIPLE-LINEAR REGRESSION FOR AREA | 50 |
| APPENDIX G: ADDITIONAL ANALYSIS MODEL: MULTIPLE-LINEAR REGRESSION FOR PROPORTION OF TWEETS | 51 |

| APPENDIX H: | CREATION OF A CATEO | GORICAL VARIABLE FOR LOGISTICAL | |
|-------------|---------------------|---------------------------------|----|
| | ANALYSIS | | 52 |
| | | | |
| APPENDIX I: | ADDITIONAL ANALYSIS | MODEL: BINARY LOGISTIC MODEL | 53 |

LIST OF TABLES

| TABLE 1: Imputation method using SPI and regions | 17 |
|--|----|
| TABLE 2: Total Tweet count of countries | 20 |
| TABLE 3: Regional analysis: Tweet count | 22 |
| TABLE 4: Adaptation of the movement | 26 |
| TABLE 5: Multiple regression analysis | 29 |
| TABLE 6: Countries with highest Tweets | 33 |

LIST OF FIGURES

| FIGURE 1: Map of Tweet count (without United States) | 21 |
|--|----------|
| FIGURE 2: Map of Tweet count (with United States) | 21 |
| FIGURE 3: Regional analysis: Gender inequality | 23 |
| FIGURE 4: Regional analysis: Internet censorship | 24 |
| FIGURE 5: Regional analysis: International Non-Governmental Organizations (INGO Network Country Score (INCS) | D) 25 |
| FIGURE 6: Time analysis: Count of Tweets by month | 26 |
| FIGURE 7: Time analysis: Count of countries every month | 27 |

CHAPTER 1: INTRODUCTION

The #metoo movement is a campaign against sexual assault and violence. It started trending on Twitter on the 15th of October 2017 after a prominent female actor encouraged members to speak up against sexual violence. Since that time, it has become an international movement that aims to spread awareness about the sexual harassment women have faced. Among other things, this movement has led multiple countries to change their laws. For example, authorities in South Korea were forced to propose new guidelines and organizational reforms to handle sexual violence claims (Hasunuma & Shin, 2019); and Japan recently expanded their legal definition of "rape", which was very limited before 2017. The movement, which is considered to be a part of the digital feminism, engages the public to challenge notions of sexism, patriarchy and others forms of oppression (Mendes, Ringrose, & Keller, 2018). While technology has helped the movement make its mark internationally, the question remains: How do local characteristics shape the diffusion of the movement?

The movement has created a platform for women across the world to speak up against violence and also receive social support (Hosterman, Johnson, Stouffer, & Herring, 2018), yet there are unique local factors that affect the experiences women endure. Local characteristics like laws, community support, and cultural norms affect those experiences and likely to shape engagement with #metoo. Therefore, capturing these differences that shape diffusion will help elaborate how social and cultural change that promotes equality can spread through social media platforms. While the movement picked up pace quickly

in the west and spread to other countries, it took a couple of months to reach the eastern hemisphere according to multiple reports and papers about the timing of the first #metoo Tweets (Hasunuma & Shin, 2019; Lin & Yang, 2019). Yet there is little information about the patterns of diffusion and studying it will give us an opportunity to better understand the cultural and structural forces that could contribute in shaping the "#metoo" movement. In this study, I focus on three main factors that could potentially help explain the diffusion of the movement: The gender equality in a country which is rooted in the structural and cultural norms; the level of internet freedom in a country, which showcases the government control and suppression of internet usage; and a country's position in the world society. This study is more comprehensive as it goes beyond previous work in this sphere that has mostly focused on few countries or specific regions. Previous research has described the common topics found in #metoo Tweets along with public sentiments about the movement (Manikonda, Beigi, Liu, & Kambhampati, 2018); offered case studies of #metoo in various countries (Hasunuma & Shin, 2019; Lin & Yang, 2019); focused on stories of survivors (Lin & Yang, 2019); and conducted surveys in a single country to identify factors affecting individuals involvement in the movement (Hassan, Mandal, Bhuiyan, Moitra, & Ahmed, 2019). Yet few studies have focused on the diffusion of the movement across countries and regions. By looking at the three broad factors described above, the goal of this study is to try and understand how these factors potentially shaped the diffusion of the movement internationally. This study builds on previous exploratory studies by describing regional differences and analyzing variation by country with respect to gender equality and specific laws, internet censorship of a country and a country's position in world society to identify factors that explain the diffusion of the movement.

CHAPTER 2: LITERATURE REVIEW

Social networking sites such as Facebook, Twitter, and Reddit give individuals an opportunity to voice their opinions freely. Indeed, with the help of these platforms almost any issue can be brought into light. In recent years, Twitter has been seen as a popular platform that helps not only share opinions but to shape them as well. It also manages to spread people's opinions to every corner of the world that has access to this networking site. In recent years, social media has been used extensively for protests to bring about potential change, start a dialogue in the political sphere, and to mobilize and organize social movements (Theocharis, Lowe, Van Deth, & García-Albacete, 2015).

2.1 Background of the Movement

The hashtag "metoo" went viral over the internet with over 12 million posts, comments and reactions on Facebook within the first 24 hours (Garcia, 2017; Mendes et al., 2018). By early November 2017, #metoo had been used on Twitter over 2.3 million times in eighty-five countries (Fox & Diehm, 2017). The term "metoo" was coined by Tarana Burke (Johnson & Hawbaker, 2018). Garcia (2017) and Hasunuma & Shin (2019) explain how the term originated. In 1997, Tarana Burke was in a community center helping sexual violence survivors open up and talk when a young girl in middle school opened up to Tarana Burke about her experience. At that point Tarana Burke wanted to say "me too" to the child; however, she could not say it back, because the horrific story of the young girl traumatized her and left her shocked. Hence, the term "me too" empowers anyone who has been a victim of sexual abuse and assault, though initially there was a particular focus on

women of color. It was on the 15th of October, 2017 when the Hollywood actress and activist Alyssa Milano used Twitter to request her followers support her in response to the sexual assault allegations against Harvey Weinstein, the movie producer (Hasunuma & Shin, 2019; Hosterman et al., 2018; Sayej, 2017). She encouraged her followers to write "#metoo" if they have ever been assaulted or sexually harassed, thus starting the movement on multiple social media platforms. Social media sites like Twitter, Facebook, and Instagram were soon filled with multiple stories of victims of sexual harassment (Hassan et al., 2019). The movement received international attention and recently TIME Magazine named the individuals who started #metoo as the 'Person of the Year 2017'(Zacharek, Dockterman, & Edwards, 2017).

2.2 Structural Position and Cultural Standing of Women

The movement spread quickly worldwide as women of different ages, colors, and professions started speaking out against the crimes committed against them (Hassan et al., 2019). Previous studies and popular media have reported that the movement is recognized by citizens across the globe. Yet local cultural norms may serve to reinforce or to hinder the adoption of the movement in a given country. The recognition and establishment of women's rights by institutions and organizations have stated clearly that any traditions, or customs that violate the rights of women should be eliminated (United Nations Women, 2015), women's rights continue to be routinely violated. Some of these violations are justified by cultural practices, including religious traditions (Okin, 1998) that subjugate women and suppress women from voicing their opinion freely.

According to Hassan et al. (2019), there was an uproar from women in many different countries against sexual harassment, South Asian women tended not to play a prominent

part in this movement. There are variety of obstacles that South Asian women endure that may contribute to this observation, including social, cultural and infrastructural ones. Some suggest that unavailability of technology, inability to communicate on social media, and differences in perception are likely some of the reasons. Likewise, similar atrocities are seen to be faced even by Middle Eastern women.

While it is seen in the western world that fear of retaliation, ignorance or trivializing the matter are some reasons why people tend to keep silent (Bergman, Langhout, Palmieri, Cortina, & Fitzgerald, 2002; Fitzgerald, Swan, & Fischer, 1995), it is quite different in the Asian and Middle Eastern countries. The culture itself oppresses women. The following examples give a more holistic idea about gender inequality in some Asian and Middle Eastern countries. In India, for example, sex is a taboo topic and talking about assault, rape and sexual abuse is looked down upon (Nair & John, 2000). Hasunuma & Shin (2019), mentions that Korean and Japanese culture perpetuate the idea sexual assault and abuse are a woman's fault; rather than opposing it, they must endure it as opposing could hamper group dynamics. According to the Human Rights Watch Report 2016, in Bangladesh sixtyfive percent of girls are married off before age 18 even though the legal age of marriage is 18; the government officials take bribes to aid the propagation of these illegal crimes. In Afghanistan, the police refuse to register cases regarding the physical and sexual assault of women. In Qatar, male guardianship is at its peak and laws discriminate against women in marriage, divorce, child custody, and inheritance. In Pakistan, it is seen in many parts that women are denied to vote. Their government does not have provisions to protect women and girls from abuse, rape, killing, acid attacks and so on (Human Rights Watch, 2015). According to The Global Gender Gap Report, the gender gap is prevalent in South East Asia, Middle Eastern and African nations (World Economic Forum, 2018). Gender inequality is present across the globe, the type of inequalities women face varies by region, over time the gender gap is reducing. However, the income gap is still very persistent, and the gap between men and women in political empowerment, economic participation and opportunity is still very wide (World Economic Forum, 2018). As it can be understood in some nations the fight is about physical restriction and oppression whereas in some nations the fight for equality has shifted from the domestic sphere to the public sphere where women are fighting for equal representation and wage equality and active participation in the labor market.

There are multiple cultural and structural gender inequalities across nations; the type and degree of inequality differs based on regions, culture, religion and so on. In certain regions the basic rights are culturally legitimate, women are allowed to vote, equal representation in parliament and pay. However, there are regions with traditions that have deep rooted gender norms which are rigid, there also exists religious beliefs that magnify gender inequalities. In totality, not supporting even the basic rights and the culture itself opposing equality.

The #metoo brings a notion of collective identity, that unifies a group based on common interests and experiences (Taylor & Whittier, 1992). By joining this movement, people can find a way to liberate themselves from the subjugation and bring awareness to the local issues, while the atrocities women face might differ in degree and type, but the notion of subjugation and inequality is common underlining. Thus, one can speculate that the #metoo movement will resonate with countries that are highly oppressive towards women.

Therefore, it might be said that, oppressive gender beliefs enhance involvement in the #metoo movement.

2.3 Internet Availability and Accessibility

Twitter and other social media have been used to mobilize multiple virtual and physical movements. There are multiple success stories that show how Twitter acts as an instrument to bring about social change by strengthening and mobilizing online activism (Gleason, 2013, Theocharis et al., 2015). A study by Gleason (2013), suggests that Twitter supported and enhanced multiple opportunities for participation in the Occupy movements by creating, tagging or sharing a hashtag, which helped individuals to be more informed and engaged. Another study analyzed Twitter use in Tunisia and Egypt showing that the users of Twitter organized protest by using the hashtag (Lotan, Graeff, Ananny, Gaffney, & Pearce, 2011). These example show that the outcomes of cyber activism has helped overcome maybe social and cultural obstacles (Kuhlow, 2013), by bringing about stories and highlighting political causes (Martin & Valenti, 2012). Hence, social movement scholars have become highly interested in analyzing these platforms, especially Twitter, as this online platform has been said to have features that help activists organize mass protests (Theocharis et al., 2015).

Mass communication via the internet, provides a digital scaffolding for societies to build on collective action and bring about social change (Howard & Hussain, 2011; Moss, 2018); however, laws have been established by some governments that hinder individuals from joining these online movements. Internet censorship by the government restricts access to global media for its residents, which obviously hinders an individual from participating in these online movements. For example, Fincher (2018), and Lin & Yang, (2019), describes

how the Chinese authorities warned their media about posting incidents of #metoo in order to maintain harmony in society. According to the Human Rights Watch Report 2016, Nigeria has laws that impede freedom of speech and expression. These laws restrict citizens and other professions like journalists and activists. There have been situations where multiple journalists were victims of harassment and intimidation in Nigeria. The government has increased its repressive laws to curb freedom of expression and speech on multiple platforms like social media, telephones, and so on. In Angola, the government has repressive censorship in state media and private outlets. In Pakistan, citizens themselves restrict their rights due to being scared of retribution from military and government officials. In Russia, authorities have blocked several online sites and proposed measures that would obstruct freedom of expression (Watch, 2015). Thus, many countries restrict a citizen's basic freedom of speech and expression. According Howard & Hussain (2011), countries with low levels of technology development tend to have the weakest democratization movements. The level of internet censorship varies to a large extent across the globe. Therefore, it is important to determine whether involvement in the #metoo movement will be restricted in contexts with high restriction and internet censorship.

Thus, it may be that internet censorship will decrease the involvement with the movement.

2.4 World Society Theory

The #metoo movement promotes ideologies and concepts that are similar to the egalitarian beliefs that world society promotes. World society is characterized by the presence of multiple international organizations that create this imagery and norms of "global" principles like democracy, racial tolerance, women's rights, human rights, rationality and so on (Meyer, Boli, Thomas, & Ramirez, 1997). Hence, the #metoo movement's emphasis

on woman empowerment is consistent with the ideology and norms that are seen as legitimate in world society. Therefore, people residing in countries that have a strong connection to the global institutions and organizations of world society may be more receptive to the #metoo movement. Recent research suggests that citizens from many countries, especially those with stronger ties to world society, increasingly view themselves as an essential part of the world and do not limit themselves to national boundaries and identities; rather, they view themselves as members of humanity, "cosmopolitan citizens" or "world citizens" (Boli, 2005; Zhou, 2016). Thus, connection to world society and this concept of global citizenship may help to explain the diffusion of the social movement.

According to world society theory, states in more central positions are likely to accept and practice common beliefs that are held in word polity. Therefore, those states have a higher chance of adopting those beliefs (Paxton, Hughes, & Reith, 2015). Countries embedded in global network are likely to adopt standardized behaviors and practices which are aligned with world models (Meyer et al., 1997). The global core is made of internationally dominated network who set the terms for global identities based on their own interests and cultural aspects (Hagan, Schoenfeld, & Palloni, 2006; Carruthers & Halliday, 2006; Cole, 2006).

It is also seen that countries that are integrated in the world in economic, political, and social terms will see its citizens identify with the global self (Zhou, 2016). Consequently, it would be expected that people in countries that have a stronger link to world society are likely to participate in #metoo than people in countries with weaker links to world society. Based on world society theory, we would expect that a country with stronger links to world society will have more involvement with the movement.

CHAPTER 3: METHODS

Social media platforms like Twitter have become a part of our daily lives. Sanawi, Samani, & Taibi (2017) stated that in the first quarter of 2017 there were 328 million active Twitter users around the globe. Twitter is being used for data analysis on this topic for two main reasons: a) It is a platform that lets people share their views, feelings, and perceptions; make connections; gain information and so on. Tumasjan, Sprenger, Sandner, & Welpe (2010) argues that a person's Twitter behavior is an indication of their political preferences and research corroborates the ability of Tweets to measure a person's sentiments. It also works the other way as b) Twitter shapes perceptions and acts as a major influencer in shaping perceptions of individuals. Therefore, it is a convenient way to gather data on a large sample with global representation.

According to a study by Gomez Bravo, Gomez Bravo, Lygidakis, & Vögele, (2019), most of the #metoo Tweets were posted on Twitter (96.2%) compared to other social media sites. Since Twitter has a larger data repository for #metoo, also, it is an open source platform and accessing the data is not expensive (Salathé & Khandelwal, 2011) it was the most convenient and suitable data source for this study.

3.1 Data Set

This paper uses a unique data set which was compiled by gathering information from multiple data sources. First, all #metoo Tweet with a geo-tag (i.e., identifiable location of origin) between October 15, 2017 and August 26, 2019 were collected via the Twitter

Application Program Interface (API) using Python. The #metoo movement became widely popular and started trending on twitter on the 15th of October 2017 because that was the day the famous female actor, Alyssa Milano, encouraged users on twitter to speak up about sexual assault.

The University of North Carolina at Charlotte has access to a large archive of historical Twitter data. Through the university's API, Tweets that were geo-tagged along with dates, location, and other user information (e.g., number of friends, status count) were collected. Tweets can be defined as the comments or posts that a user shares on the social media, Twitter. It must be specified here that when talking about Tweets, it means only posts on Twitter that have their location mentioned, in other words geo-tagged. The Tweets were written in multiple languages so to verify that these non-English Tweets aligned with the #metoo movement, they were converted to English using Google sheets. It was thoroughly checked to see if the Tweets matched the topics common in the #metoo movement. Then other country-level variables were added to create a data set with 143 data points. In the process of data collection, I found that a small number of countries had missing values for multiple independent variables. Hence, if a country did not have data for at least 30% of the dataset, they were removed from the analysis, leaving the data set with 130 countries.

3.2 Dependent Variables

3.2.1 Volume of Tweets per Country

The dependent variable for the analysis is the raw count of the number of tweets originating from a country. This will give a direct insight into the number of Tweets received from each country.

3.3 Independent Variables

3.3.1 Structural and Cultural standing of a Women: Gender Inequality Index

The Gender Inequality Index, 2018 is a measurement of gender disparity. It was introduced in the year 2010 by the United Nations Development Program. This index aims to quantify the loss of achievement within a country due to gender inequality. It uses three dimensions to measure opportunity cost: reproductive health, empowerment, and labor market participation. This variable will help explain the possible association of individuals to the #metoo movement based on the gender norms of a country. The data was collected from Human Development Data (1990-2017) by United Nations Development Program.

3.3.2 Structural and Cultural standing of a Women: Social Institution and Gender Index
The gender, institution and development database (GID-DB), 2019 has been created from
Social Institution and Gender Index (SIGI) to understand gender-based discriminations.
Three variables, laws in country to get "Access to Justice", laws for "Violence Against
Women" and laws for "Workplace Rights", were incorporated into the dataset as it will
control for a country's legislative laws pertaining to gender discrimination. If a country has
received a score point of 1, that suggests a countries laws being highly discriminatory,
whereas score of 0 suggest, low discrimination.

The variable, "Laws on access to justice" measures "Whether women and men have the same rights to provide testimony in court, hold public or political office in the judiciary and sue". The variable, "Laws on violence against women" measures "Whether the legal framework protects women from violence including intimate partner violence, rape and sexual harassment, without legal exceptions and in a comprehensive approach" and finally,

"Laws on workplace rights" measures "Whether women and men have the same legal rights and opportunities in the workplace". The information (laws) for these variables has been analyzed from multiple other datasets and then summarized by SIGI. Hence, a comprehensive analysis of a country's legal structure and frame will shed light on the gender gap from a legislative standpoint.

3.3.3 Control and Suppression of Internet Usage: Freedom on the Net

To evaluate a nation's control over its residents' access to and freedom on the internet, a score point analysis collected from Freedom on the Net, 2018 was incorporated into the data set. Freedom on the Net is a collaborative effort with the Freedom House. They are trying to understand the rights and freedoms enjoyed by people within each country. They assess these three main themes: obstacle to access, limit on content and violations of user rights – and then assign a cumulative score to each country (Freedom House, 2018). A country receives a score out of 100, higher score signifies more restrictions. The data from the Freedom House has been used by multiple studies, this study by Ruijgrok, (2017) utilizes the data from the freedom on the net specifically.

3.3.4 Links to World Society: International Non-Governmental Organizations (INGO)

Membership in international non-governmental organizations (INGOs) has been the most commonly used measure of links to world society. The World society theory proposes that countries are embedded in the global network or in other words "world polity" (Boli & Thomas, 1997, 1999; Meyer et al., 1997), that uphold standards of behavior. Studies have shown that INGO's can be related to the outcome of multiple social phenomena(Hughes, Peterson, Harrison, & Paxton, 2009). Thus, countries in the network tend to adopt and the

model behaviors and standards. This justifies using INGOs to calculate the interconnectedness. More recently, the international non-governmental organizations (INGO) Network Country Score (INCS), has been used to measure country-level connectedness to the world polity. A paper by (Paxton et al., 2015), extends this INCS that measures a countries centrality in the global network. Hence, this suitable and reliable score has been incorporated in the data set.

3.3.5 Links to World Society: Women's International Non-Governmental Organizations

To add another dimension to understand a countries connection to world society a
countries-level of membership in regard to women's organization, the count of Women's
International Non-Governmental Organizations (WINGO), 1950-2013, was incorporated
into the data set. This data was publicly realized in March 2017, and is widely used and
reliable as Hughes et al.(2017) and Hughes et al.(2018) have used it for their research. This
variable was added as the movement is about sexual violence on women, adding this will
give a new perspective.

3.4 Control Variables

3.4.1 Gross Domestic Product Per Capita

The Gross Domestic Product Per Capita (Nominal), GDP Per Capita was incorporated to control for a country's economic standing. The GDP per Capita is an indicator of the country's social and economic progress and it is a good metric to understand the standard of living in a country. However, it does not account for income distribution in a country. For the purpose of this research, the GDP Per Capita (in dollars) was incorporated in the dataset from the data warehouse of International Monetary Fund.

According to literature, individuals from affluent countries tend to adopt "social values that emphasize self-expression, individual rights, the quality of life, and cosmopolitanism", since they are economically stable. Whereas, "less developed countries are still occupied by domestic concerns, and their top priority is still national development" consequently, they are less likely to be involved with global identities or movements (Zhou, 2016). This is the reason to control for a social progress of a country. A countries social and economic standing seems to have an effect on movements. Thus, accounting for GDP per Capita is vital for the analysis.

3.4.2 Social Progress Imperative

In 2013, the Social Progress Imperative introduced the Social Progress Index (SPI). This index has a fifty-four social and environmental outcome indicators that measures the social development (Porter, Stern, & Green, 2014). This index showcases the level of development in different countries; therefore, this index has also been incorporated in the data set. The Social Progress Imperative of 2019 gives a score to each country based on the basic human needs, foundations of well-being and opportunity. This measure was incorporated into the dataset to act as another control variable for a countries social progress from the Social Progress Imperative.

3.4.3 Total Population

Countries total population was added as another control for the analysis. This will act as a control variable and help explain some of the findings. The data was gathered from the World Population Prospects by the United Nations.

3.4.4 Overall Twitter Activity

The average geo-tagged Tweets in a country for a span of two years will act as the final control variable. Because there is no accurate information on the overall Twitter activity from a country, a new variable was created. To do so, using Twitter API through Python, these seven words were searched on Twitter historical data, for a span of two years, "poverty", "politics", "inequality", "gender", "movies", "food" and "weather". These words were chosen as they are common words and most likely to be used by users. The generated output gave an individual count of these words per country. Then, the average count was taken of these seven to generate a variable that signifies the overall Twitter activity of a country.

3.5 Analysis Plan

The analysis starts with a global exploration that uses descriptive methods aimed at highlighting the difference between the various countries with respect to the movement. As mentioned earlier, there were multiple missing data points that would cause a hindrance for further analysis. "Freedom on the Net" that scores a country based on their censorship, had multiple data points that were missing. Hence, an imputation technique was implemented. All 130 countries were categorized into seven regions, Asia & Pacific, Europe, Africa, Oceania, South/Latin America, North America, and Arab States (Note 1). Through descriptive statistics, it was found that there was a high correlation between the internet censorship score and Social Progress Index. A country with low censorship score was seen to have a high social progress. Hence, to create a more robust method of imputation, the distribution of SPI was broken down into four quartiles and then countries were categorized based on distribution and region, see Table 1.

Table 1: Imputation method using SPI and regions

| Regions | SPI Quartiles | | | |
|---------------------|---------------|------|------|-------|
| | 1 | 2 | 3 | 4 |
| Asia & Pacific | 53.2 | 64.4 | 36.1 | 33 |
| Europe | | 45.6 | 36.1 | 18.25 |
| Africa | 46.8 | 25 | 0 | |
| Oceania | 0 | 0 | | 21 |
| South/Latin America | 0 | 34 | 79 | |
| North America | | | | |
| Arab States | 0 | 54.6 | 53.5 | 0 |

Then the average was calculated for each category from available data. Therefore, countries with no internet score would be imputed with a value based on their region and the quartiles. For example, a country from Asia who falls within quartile four, would receive an internet censorship score of 33. However, there are a lot of categories with no score (where value is 0) because after categorization there was no available data to calculate internet censorship score for that category. Thus, a linear regression imputation method was used to generate data for all the independent variables with missing values. Because the data was structured randomly across the data set. It was essential to first make them into a monotone structure, the Markov Chain Monte Carlo (MCMC) method was used to first make the structure into monotone. Then the multiple-linear regression function was used to generate values for the missing variables. The imputation technique uses all available data to generate values by using a linear regression method. According to (Yuan, 2000), the regression model is fitted for all missing values for each variable, with the previous variables as covariates. Hence, through this method 49 values were imputed to create a complete dataset (Appendix A).

To reduce the number of variables a factor analysis was run on three variables that were taken from the Gender, Institution and Development Database that measured the countries laws:

- 1) Laws in country to get "Access to Justice"
- 2) Laws for "Violence Against Women"
- 3) Laws for "Workplace Rights"

These three variables all explained a country's laws from different perspectives. Through the factor analysis it was found that "Access to Justice" and "Workplace Rights" were highly correlated. Therefore, these two variables were merged to create a combined variable. This reduced the number of variables and created a better model for further analysis.

The final dataset is composed of six independent variables and three control variables (descriptive statistics: Appendix B, C, D). The variable that measures the social progress of a country (*Social Progress Imperative, SPI*) was dropped before conducting multiple linear regression as it was highly correlated to two other variables (Note 2).

The final stage of the analysis was conducting a multiple linear regression to see how these variables affected the Tweet count in a country. All the variables with large values were made into a logarithmic form and the multiple-linear regression models were conducted.

The multiple linear regression model was chosen after careful consideration of other statistical techniques. Prior to conducting the multiple linear regression, other methods were tested; since the dependent variable is a count (Volume of Tweets per Country) a negative binomial model was created (Appendix E), the output was very similar to the results of the multiple linear regression. The only difference being, in the negative binomial model, the internet censorship is not statically significant and laws for Violence Against Women was significant. However, the direction of the variables was consistent with the results from the multiple linear regression, internet censorship and laws for violence against women both had a negative affect. Other techniques were also tested, two dependent variables were generated 1) calculation of areas based on the time period (month of Tweet) and Tweet count, and 2) proportion variable explaining the total #metoo Tweets per country with respect to overall Twitter activity of the country. The aim was to capture the timing of the Tweets with respect to volume. To evaluate the effect of the independent variables on the two dependent variables two different multiple linear regression models were created (Appendix F and G). However, no conclusive results could be drawn. Thus, a categorical dependent variable was created to again capture the timing and volume of Tweets, the average month countries Tweets for the first time and average Tweet count (without United States) was used to create a nominal variable (see Appendix H). Several binary logistic and multinomial logistic models were created (example, Appendix I). However, no significant result could be concluded. One possible explanation was that there was too much overlap in the values that failed to distinguish what was expected. These different methodologies were implemented to find the most appropriate technique for this study.

CHAPTER 4: RESULTS

4.1 Descriptive Statistics

The total number of Tweets collected over a span of 23 months was 28,372. These Tweets originated in 143 different countries. Table 2 shows the distribution of the count of the Tweets globally. Clearly, the United States of America (USA) has the largest Tweet count with 14,596 Tweets. Following USA is United Kingdom (UK), India, Japan, Mexico, and Canada. These six countries have a significantly larger Tweet count than the rest of the countries in the dataset. The average Tweet count is 198; however, if USA is excluded, the average Tweet count drops to 98.

Table 2: Total Tweet count of countries

Count: 5 to 10 Count: 11 to 50 Count: 51 to 100 Count: 101 to 1000 Count: 1001 to 2000 Iceland Kenya Latvia Romania Vietnam El Salvador Morocco Norway Netherlands France Spain Australia Pakistan Germany Nigeria Greece Sweden Colombia Poland Chile People's Republic of Chir Hong Kong Czech Republic United Arab Em El Salvador Morocco Jamaica Malawi Estonia Bangladesh Kuwait Lebanon Trinidad and Tobago Bulgaria Cuba Kazakhstan Malta Oman Finland Malaysia Dominican Republic Count: Above 2000 61 57 56 55 Portugal United States Russia Venezuela Peru Thailand Singapore Taiwan Turkey Hungary Kingdom of Saudi Arabia Ghana Tanzania Ecuador Costa Rica Nepal Uganda Islamic Republic of Iran Namibia

Republic of Serbia

Total Tweet Counts By Country

To get a better understanding of the movement the following two figures show a global representation of the Tweet count per country.

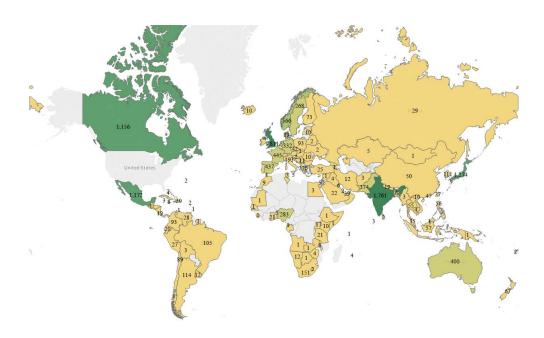


Figure 1: Map of Tweet count (without United States)

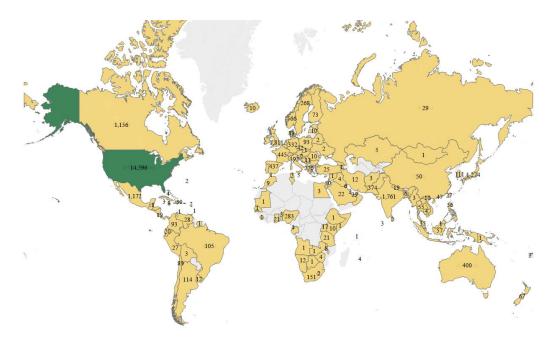


Figure 2: Map of Tweet count (with United States)

The figures give a holistic outlook on the movement and also consider if certain regions have a larger domination in the movement. Hence, Table 3 gives a regional breakdown of the average Tweet count and percentage of the total Tweets.

Table 3: Regional analysis: Tweet count

| Regions | Average Tweet Count | Percentage of Tweets |
|---------------------|---------------------|----------------------|
| North America | 5,251 | 55.61% |
| Asia and Pacific | 152 | 13.93% |
| Europe | 127 | 20.21% |
| Oceania | 118 | 1.66% |
| South/Latin America | 59 | 6.29% |
| Africa | 25 | 1.93% |
| Arab States | 8 | 0.37% |

N= 143

The average Tweet count is highest in North America, followed by Asia and Pacific, then Europe. The average Tweet count is lowest in Arab States, followed by Africa, and South/Latin America. A further analysis in Figures 3, 4 and 5 explain some basic differences between the regions.

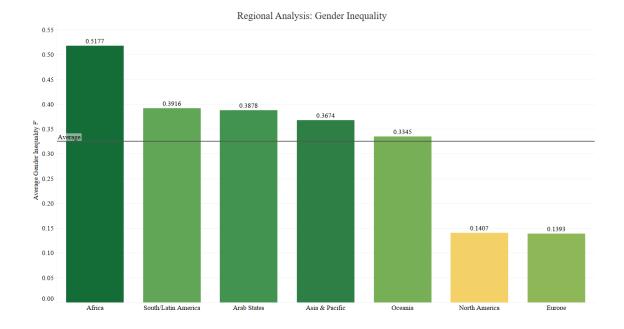


Figure 3: Regional analysis: Gender inequality

According to Figure 3, Africa, followed by South/Latin America and Arab states all have higher than average gender inequality based on Gender Inequality Index. Whereas North America and Europe are below average. Looking at distinctive countries' Gender Inequality Index it is seen that Switzerland has the lowest gender inequality, followed by Denmark and Sweden while Somalia has the highest, followed by Papua New Guinea and Angola.

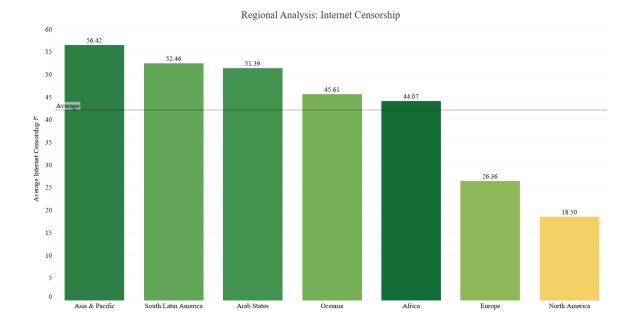


Figure 4: Regional analysis: Internet censorship

Figure 4 indicates that the government restrictions on internet usage are highest in Asia & Pacific, followed by South/Latin America, then Arab States. Only Europe and North America are below the mean.

Finally, from Figure 5 it can be seen that North America and Europe have stronger connections to world society as indicated by higher INCS, followed by Oceania. Africa followed by Arab States and Asia & Pacific have the lowest INCS. Again, going into some specific countries INCS, it is seen that Equatorial Guinea, has the lowest INCS, followed by Maldives and Somalia whereas Germany has the highest score, then France and Italy.

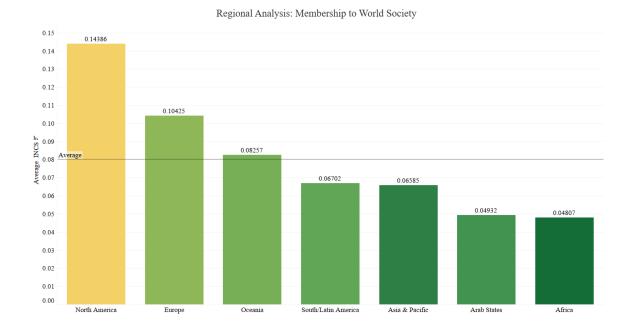


Figure 5: Regional analysis: International Non-Governmental Organizations (INGO) Network Country Score (INCS)

The digital movement has spread globally and in some situations the movement has adapted to the local needs of the area (Ghadery, 2019). Some have adapted through a linguistic change, using the local language to participate in the movement. For example, "#YoTambien" is a commonly used Spanish variation of #metoo; the French started using "#BalanceTonPorc" which means "#DenounceYourPig" or "Expose your Pig" (Tarnopolsky & Etehad, 2017); in Italy, "#QuellaVoltaChe" started trending which means "that time" (Lekach 2017), see Table 4. In some nations they adapted #metoo to speak about more relatable experiences in their local customs and experiences. The "#MosqueMeToo" gained more popularity among Muslim women, for example, as the hashtag was used to spread awareness about the sexual abuse women faced in place of worship (Farrag, 2018).

Table 4: Adaptation of the movement

| County | Text | Text in English | Language | Count |
|---|----------------|--|----------|-------|
| Italy | Quellavoltache | That Time | Italian | 21 |
| France | BalanceTonPorc | Expose your Pig, Denounce your Pig | French | 308 |
| Spain, United States and Latin America | Yo Tambien | Me Too | Spanish | 381 |

The movement spread gradually over time. Figure 6 shows how the total number of Tweets increased every month. It steadily picks up and reaches its high point in 2019, especially in April when there are 5,006 Tweets.

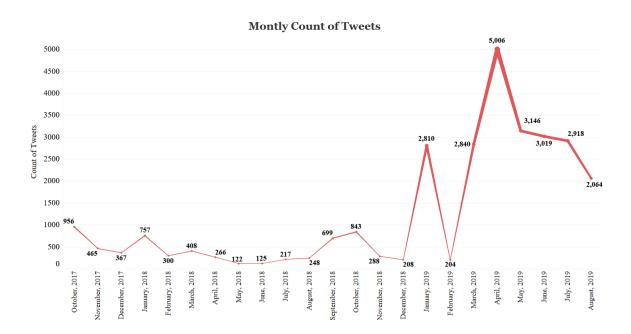


Figure 6: Time Analysis: Count of Tweets by Month

There are a few possible factors that could explain the spike in Tweets in the month of April 2019. On April 4th 2019, in United States, The House of representatives reauthorized the "Violence Against Women Act" which had expired in September 2018 (American Bar Association, 2019). The change in the law could have caused such a major spike in the counts. A video on twitter shared by an American politician also drew a lot of attention. In the video he acknowledges his tendency to display affection that could have caused discomfort to people so he promises to be more careful henceforth (Beaumont, 2019). Both these factors may have contributed to the spike in Tweets across the globe, especially in the US.



Figure 7: Time analysis: Count of countries every month

Even though United States accounts for a majority of the total Tweets, Figure 7 shows how many unique countries have Tweeted every month. The number of countries has increased from 49 in the first month (October, 2017) to reach its highest point in April, 2019 with 88 distinctive countries. That is an increase of more than 40% since the first

month. This shows how the movement has picked up on a global scale especially since 2019. The movement might have originated in Untied States but it has a large and growing global presence.

4.2 Multiple Linear Regression Analysis

The dependent variable for the analysis is the count of Tweets per country, the logarithmic form was taken for this analysis. The multiple linear regression seemed to be the most appropriate technique for statistical analysis. As seen in Table 5, each of the Models, 1, 2, 3 are representations of: Structural and Cultural Position of Women, Internet Availability and Accessibility, and Link to World Society respectively (along with controls). Finally, Model 4 is a complete model that incorporates all the variables.

Table 5: Multiple regression analysis

| | Model 1 | Model 2 | Model 3 | Model 4 |
|--|----------|-----------|----------|-----------|
| Structural and Cultural Position of Women | | | | |
| Gender Inequality | 0.1591 | | | 2.2041* |
| Laws for Violence Against Women | 0.1748 | | | -0.0939 |
| Laws for Access to Justice and Workplace Rights | -0.6676* | | | 0.2917 |
| Internet Availability and Accessibility | | | | |
| Ln (Internet Censorship) | | -0.8646** | | -0.4652* |
| Link to World Society | | | | |
| INCS | | | 26.005** | 26.1823** |
| Ln (WINGO) | | | -0.0417 | -0.0234 |
| Control Variables | | | | |
| Ln (GDP Per Capita) | 0.3083* | 0.2695* | 0.0534 | 0.17394 |
| Ln (Population) | 0.0835 | 0.1483 | 0.1124 | 0.05001* |
| Ln (Overall Twitter Activity) | 0.4828** | 0.4673** | 0.3498** | 0.3589** |
| Adjusted R-Square | 0.731 | 0.738 | 0.767 | 0.794 |

^{*}p<0.05, **p<0.01, N=130

According to Model 1, only laws for access to justice and workplace rights is statistically significant and has an inverse relationship with the count of Tweets. An increase in the degree of discriminatory laws and rights will reduce the count of Tweets. From Model 2, it can be interpreted that internet censorship has an inverse relationship with Tweet count. An increase in internet censorship will reduce the count of Tweets. In Model 3, only INCS is statistically significant and an increase in INCS will increase the number of Tweets significantly. Finally, Model 4, shows almost consistent results with the previous models,

except in case of Structural and Cultural Position of Women. Adding the other variables into the model, gender inequality becomes statistically significant, an increase in gender inequality will increase the Tweet count, laws for access to justice and workplace rights is not statistically significant in this model. While the rest of the results seem pretty consistent, an increase in internet censorship would reduce the Tweet count. Whereas, an increase in INCS would increase the Tweet count. All the models have almost the same explanation power, only Model 4 has a slightly better explanation power than the rest. Finally, by adding the control variables in each model, the GDP per capita, population and overall Twitter activity are taken into account for the analysis making the effect of the independent variables much strong.

CHAPTER 5: DISCUSSION

The findings suggest that by just looking at the Structural and Cultural Position of Women, the laws for access to justice and workplace rights decreases the involvement of the movement (Model 1). As mentioned earlier, the type of inequality could vary by regions or other factors, a major literature about the movement focuses on anti-discrimination laws in workplace and the movement has seen multiple survivors advocating access to safety, justice and wage equality (McBride, Mitra, Kondo, Elmi, & Kamal, 2018). It is also seen that in multiple nations across the world, women are not allowed to work, patriarchy is still dominant and resources for safety are scarce, so they might not be able to identify with the movement due to lack of experience in regards to work place discrimination or being afraid that they might not receive support rather they might face retaliation, so even though laws become more discriminatory the involvement would not increase. This could be a probable cause as to why the laws for access to justice and workplace rights reduces the involvement with the movement. However, taking into account all the other factors, the gender inequality increases the involvement with the movement (Model 4). The results for Structural and Cultural Position of Women are not very conclusive, as the direction of the variables changes in the final model and not all variables are consistently statically significant (Model 1 vs Model 4). However, according to Model 4 we accept our first hypothesis, a highly repressive and oppressive culture leads more people to become engaged with the movement. Now looking at internet censorship, we see that a higher control and suppression of internet usage decreases the involvement with the movement,

thus we can accept the second hypothesis. The restrictions placed by authorities do seem to act as a barrier for engagement with social movements. Finally, the link INGO seems to have a larger effect than the linkage to WINGO's. Therefore, countries with stronger links (higher INCS) to world society will have more involvement with the movement, thus we also accept the third hypothesis. However, recently Gorman & Seguin (2018), presented a theortical arugment that gives a different perspective, "members of the peripheral groups," including individuals or nations that are yet to become a part of global society, are more likely to identify with the universalistic, global identities because they feel threatened by their local conditions. This theory suggests that threat is seen as a component that drives marginalized groups to push themselves within the global identities possibly due to lack of resources and organizational structure (Migdal, 1988). However, the findings of this study aligns more with the theoretical arguments made in world society, countries with stronger links tend to be more involved.

To summarize, the findings are persistent with the literature as one would expect high gender inequality in a country would instigate more people to speak up against the oppression, whereas, restrictions from the authorities would act as an obstacle for freedom of speech on the internet. And as expected, the more integrated a country is in the world polity, the higher chance they have in following the set standards and behaviors. While these variables do explain the models to a certain degree, the control variables, GDP Per capita and overall Twitter activity have almost been persistently statistically significant and explain all the models to a large extent.

Table 6: Countries with highest Tweets

| Country | Tweet Count |
|----------------|-------------|
| United States | 14,596 |
| United Kingdom | 1,811 |
| India | 1,761 |
| Japan | 1,247 |
| Mexico | 1,172 |
| Canada | 1,156 |

The results also give further insight into the top six countries with highest number of Tweets (see Table 6). Gomez Bravo et al. (2019), analyzed multiple social media sites for 60 days. The results from their analysis are quite similar to these findings, as they suggested that most #metoo Tweets came from USA, followed by UK, Canada, India, and so on. According to literature the two critical factors that help strengthen a social movement are, economic welfare and social resources (McAdam, McCarthy, Zald, & Mayer, 1996; McCarthy, 1996; McCarthy & Zald, 1977; Smith & Wiest, 2005). The high level of participation in affluent and socially progressive countries like the USA, UK, Japan and Canada are consistent with this common finding. However, the appearance of India and Mexico in this group may seem less likely. Both India and Mexico are quite similar, as they have a large population with extreme income disparity among people and both are developing countries. The gender inequality in these countries are higher than the average, the number of INGO and WINGO is better than other developing countries and they have minimum internet censorship. These factors and findings not only help explain the significant number of Tweets but also align with the literature. According to study

conducted by (Smith & Wiest, 2005) countries who have a greater number of connections to INGO's tend to participate in more movements than countries who tend to have fewer ties, which has been found to be especially true for low-income countries.

A unique feature that can also explain the movement developing in India is the connection with the film industry. The movement was started on Twitter by a Hollywood celebrity; And according to articles in India, the movement received a lot of attention since many men in the India Cinema Industry (Bollywood), were accused of harassment and assault (Roy, 2019). The connection of a common industry can be contributed as a factor that helped the movement proliferate in India.

CHAPTER 6: CONCLUSION

The movement gradually picked up momentum in January 2019. While USA has been a major contributor, there has been a significant increase in the number of countries who are joining the movement, making it an international movement that is still in the process of diffusing across the globe. Social media not only acts as a platform for the movement to spread but the features of these various social media platforms acts as a catalyst for the diffusion of the movement. The #metoo has been adapted and modified by several countries to be more attuned with the local experiences and languages. In China, the movement faced a massive backlash from the authorities during which posts and online pages were removed (Zeng, 2018). In order to circumvent the censorship, they adapted another version of #metoo which is #ricebunny. The innovative method to bypass the censorship on the Chinese version of Twitter, Weibo (Yang, 2018), really shows that even though censorship and restrictions might be present, the movement is fighting against the official repression and cultural obduracy (Richburg, 2018). From the findings it can be said that an increase in gender inequality will increase the participation. The deep-rooted gender norms are being broken and change is being brought about widely as countries are changing and modifying their laws (Stone & Vogelstein, 2019). With the help of social media, multiple high-profile cases have been brought into light across the globe, especially in political spheres. The findings also suggest that internet censorship does pose a threat to the movement as it will decrease the number of Tweets. According to (Rebecca, 2012) internet censorship and online surveillance creates paranoia and fear

among individuals. However, people remain anonymous, take other identities while sharing their views or are finding innovative ways to circumvent the restrictions. For example, even under conditions of high censorship the Arab Spring movement took place to bring about revolutionary changes in the Arab countries with the help of technology and online forums (Ahmed, Cho, & Society, 2019). Similarly, Thorsen and Sreedharan (2019) analyzed 2.7 million Tweets to examine the Saudi women's rights campaign to end male guardianship. Thus, showing the resilience among people to fight for the cause they believe in irrespective of internet censorship. Finally, a country's position in world society has a large influence on the movement. The larger presence of INGOs significantly increases the response to the movement as the increase number of INGOs would make countries more embedded in the global network. According to literature, countries positioned more centrally in the global network are more likely to adopt standards of behavior and belief set by the world polity (Paxton et al., 2015). These arguments validate my findings as countries that have a stronger link to world society are more likely to have participants in #metoo than are countries with weaker links.

To conclude, there are multiple factors that shape the likelihood that a country's residents participate in the global movement. This research aims not only identify the effects of gender inequality, internet censorship and position in world society but also to establish that social media analysis offers unique advantages as a method to conduct research. The participation of a country in global movements can also be used to identify a country's position in the global network.

6.1 Future Research

For a more in-depth analysis in the future, the content of some of the Tweets could be evaluated in order to try and categorize them based on similar topic or theme. A study by (Mendes et al., 2018) aimed to categorize the content of the Tweets to try and map out the experiences of the people involved. Future research can use similar methods to a do more in depth analysis of cultural and regional differences. This will help give insight about the differences in language, experiences and perception of the individuals posting #metoo across various regions and cultures. Also, a similar analysis can be done to see if the experiences of marginalized women, especially women of color, are different as a recent papers criticizes—the movement for not taking into account the vulnerabilities faced by marginalized women (Onwuachi-Willig, 2018).

6.2 Notes

- 1) The countries were allocated into regions based on the regional analysis by the United Nations
- 2) Social Progress Index (SPI) was dropped from analysis because it was highly correlated with gender inequality and internet censorship
- 3) The GDP Per Capita of Syria taken from 2010, United Nations Statistics Division

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APPENDIX A: NUMBER OF MISSING VALUES FOR INDEPENDENT VARIABLES

| Variables | Count of Missing |
|---|---------------------|
| Structural and Cultural Position of Women | |
| Gender Inequality | 5 |
| Laws for Violence Against Women | 0 |
| Laws for Access to Justice and Workplace Rights | 0 |
| Internet Availability and Accessibility | |
| Internet Censorship | 75* |
| Membership to World Society | |
| INCS | 1 |
| WINGO | 16 |
| Control Variables | |
| GDP Per Capita | 1** |
| Population | 0 |
| Overall Twitter Activity | 0 |

N=130

^{*56} cases were imputed through Regional and SPI analysis for Internet Censorship

^{**}GDP Per Capita of Syria is missing, last recorded GDP Per Capita applied for the study

APPENDIX B: TABLE: DESCRIPTIVE STATISTICS FOR INDEPENDENT VARIABLES BEFORE IMPUTATION

| Variables | Mean | Median | Variance | SD* | Min | Max |
|--|---------------|---------------|---------------------|----------------|------------|-----------------|
| Gender Inequality | 0.313 | 0.311 | 0.032 | 0.179 | 0.039 | 0.741 |
| Laws for Violence Against Women | 0.577 | 0.750 | 0.046 | 0.215 | 0.250 | 1.000 |
| Laws for Access to Justice | 0.246 | 0.125 | 0.094 | 0.307 | 0.000 | 1.000 |
| Laws for Workplac e Rights | 0.669 | 1.000 | 0.166 | 0.407 | 0.000 | 1.000 |
| Internet Censorshi p | 40.371 | 36.100 | 395.435 | 19.886 | 6.000 | 88.000 |
| INCS | 0.076 | 0.069 | 0.002 | 0.040 | 0.012 | 0.149 |
| WINGO | 64.833 | 57.000 | 1243.330 | 35.261 | 11.00 0 | 152.000 |
| GDP Per Capita | 709.097 | 86.779 | 5443904.330 | 2333.220 | 1.583 | 20580.250 |
| Populatio n | 54185.0 00 | 11001.0 20 | 31489112766.0 00 | 177451.7 20 | 97.74 1 | 1433783.6 90 |
| Overall Twitter Activity | 837.255 | 59.857 | 14415534.280 | 3796.780 | 0.429 | 38349.570 |

N=130, SD*= Standard Deviation, Min=Minimum, Max=Maximum

APPENDIX C: DESCRIPTIVE STATISTICS FOR INDEPENDENT VARIABLES AFTER IMPUTATION

| Variables | Mean | Median | Variance | SD | Min | Max |
|--------------------|---------|---------|--------------|----------|-------|-----------|
| Gender | 0.323 | 0.323 | 0.034 | 0.185 | 0.039 | 0.881 |
| Inequality | 0.555 | 0.750 | 0.046 | 0.214 | 0.050 | 1.000 |
| Laws for | 0.577 | 0.750 | 0.046 | 0.214 | 0.250 | 1.000 |
| Violence | | | | | | |
| Against | | | | | | |
| Women | 0.246 | 0.246 | 0.002 | 0.205 | 0.000 | 1.000 |
| Laws for | 0.246 | 0.246 | 0.093 | 0.305 | 0.000 | 1.000 |
| Access to Justice | | | | | | |
| Laws for | 0.669 | 1.000 | 0.165 | 0.406 | 0.000 | 1.000 |
| Workplace | 0.009 | 1.000 | 0.103 | 0.406 | 0.000 | 1.000 |
| Rights | | | | | | |
| Internet | 42.701 | 40.000 | 444.985 | 21.095 | 6.000 | 109.981 |
| Censorship | 42.701 | 40.000 | 444.763 | 21.093 | 0.000 | 109.981 |
| • | 0.075 | 0.069 | 0.002 | 0.040 | 0.012 | 0.149 |
| INCS | 0.075 | 0.007 | 0.002 | 0.040 | 0.012 | 0.147 |
| WINGO | 59.857 | 53.000 | 1325.240 | 36.404 | 1.000 | 152.000 |
| GDP Per | 709.097 | 87.928 | 5402028.140 | 2324.230 | 1.583 | 20580.250 |
| Capita | | | | | | |
| D = ===1 = 41 = == | 54185.0 | 11001.0 | 31489112766. | 177451.7 | 97.7 | 1433783.6 |
| Population | 00 | 20 | 000 | 20 | 41 | 90 |
| Overall | 837.255 | 61.429 | 14304645.550 | 3782.150 | 0.429 | 38349.570 |
| Twitter | | | | | | |
| Activity | | | | | | |

N=130, SD= Standard Deviation, Min=Minimum, Max=Maximum

APPENDIX D: CORRELATION ANALYSIS FOR INDEPENDENT VARIABLES

| | Pearson Correlation Coefficients, N = 130 | | | | | | | | | |
|----------------------------|---|----------|-------------------------------------|---------------------------------|------------------------|--------|--------|-------------------|------------|--------------------------------|
| | Gender Inequality | Violence | Laws for Access to Justice | Laws for Workplace Rights | Internet Censorship | INCS | WINGO | GDP Per Capita | Population | Overall Twitter Activity |
| Gender Inequality | 1.000 | 0.144 | 0.420 | 0.383 | 0.505 | -0.619 | -0.412 | -0.194 | 0.045 | -0.158 |
| Laws for Violence Against | 0.144 | 1.000 | 0.261 | 0.237 | 0.292 | -0.163 | -0.152 | 0.046 | 0.058 | -0.025 |
| Laws for Access to Justice | 0.420 | 0.261 | 1.000 | 0.370 | 0.283 | -0.434 | -0.406 | -0.173 | -0.016 | -0.137 |
| Laws for Workplace Rights | 0.383 | 0.237 | 0.370 | 1.000 | 0.462 | -0.419 | -0.462 | -0.042 | 0.115 | -0.107 |
| Internet Censorship | 0.505 | 0.292 | 0.283 | 0.462 | 1.000 | -0.494 | -0.514 | 0.004 | 0.148 | -0.168 |
| INCS | -0.619 | -0.163 | -0.434 | -0.419 | -0.494 | 1.000 | 0.895 | 0.339 | 0.233 | 0.325 |
| WINGO | -0.412 | -0.152 | -0.406 | -0.462 | -0.514 | 0.895 | 1.000 | 0.312 | 0.184 | 0.398 |
| GDP Per Capita | -0.194 | 0.046 | -0.173 | -0.042 | 0.004 | 0.339 | 0.312 | 1.000 | 0.528 | 0.745 |
| Population | 0.045 | 0.058 | -0.016 | 0.115 | 0.148 | 0.233 | 0.184 | 0.528 | 1.000 | 0.193 |
| Overall Twitter Activity | -0.158 | -0.025 | -0.137 | -0.107 | -0.168 | 0.325 | 0.398 | 0.745 | 0.193 | 1.000 |

APPENDIX E: ADDITIONAL ANALYSIS MODEL: NEGATIVE BINOMIAL MODEL

| | Model 1 |
|---|----------|
| Structural and Cultural Position of Women | |
| Gender Inequality | 2.827* |
| Laws for Violence Against Women | -0.946* |
| Laws for Access to Justice and Workplace Rights | -0.318 |
| Internet Availability and Accessibility | |
| Ln (Internet Censorship) | -0.313 |
| Membership to World Society | |
| INCS | 29.012** |
| Ln (WINGO) | -0.182 |
| Control Variables | |
| Ln (GDP Per Capita) | 0.3541* |
| Ln (Population) | 0.056 |
| Ln (Overall Twitter Activity) | 0.224* |
| Dispersion | 0.747 |

^{*}p<0.5 **p<0.01 N=130

The count variable (volume of Tweets per county) was used for the negative binomial model. The output above shows findings very similar to the multiple linear regression model, the only difference being laws for violence against women and internet censorship. Since, the output is very similar, the output for the multiple linear regression was used for this paper.

APPENDIX F: ADDITIONAL ANALYSIS MODEL: MULTIPLE-LINEAR REGRESSION FOR AREA

| | Model 1 |
|---|----------|
| Structural and Cultural Position of Women | |
| Gender Inequality | 0.36255 |
| Laws for Violence Against Women | -0.09008 |
| Laws for Access to Justice and Workplace Rights | -0.04554 |
| Internet Availability and Accessibility | |
| Ln (Internet Censorship) | 0.09775 |
| Membership to World Society | |
| INCS | 0.92292 |
| Ln (WINGO) | 0.0509 |
| Control Variables | |
| Ln (GDP Per Capita) | 0.01557 |
| Ln (Population) | -0.03174 |
| Ln (Overall Twitter Activity) | -0.03191 |
| R-Square | 0.1019 |

^{*}p<0.5 **p<0.01 N=130

Other techniques were implemented to try and capture the time period and volume of Tweets. The idea was to distinguish countries who were earlier and had large volume of Tweets, late and large volume, early and small volume, and finally late and small volume. To do so, the area based on the time period (month of Tweet) and Tweet count was calculated. However, no conclusive results could be drawn.

APPENDIX G: ADDITIONAL ANALYSIS MODEL: MULTIPLE-LINEAR REGRESSION FOR PROPORTION OF TWEETS

| | Model 1 |
|---|---------|
| Structural and Cultural Position of Women | |
| Gender Inequality | -0.0033 |
| Laws for Violence Against Women | 0.04289 |
| Laws for Access to Justice and Workplace Rights | 0.00728 |
| Internet Availability and Accessibility | |
| Ln (Internet Censorship) | -0.0597 |
| Membership to World Society | |
| INCS | 0.13819 |
| Ln (WINGO) | -0.0469 |
| Control Variables | |
| Ln (GDP Per Capita) | -0.0111 |
| Ln (Population) | 0.04211 |
| Ln (Overall Twitter Activity) | -0.0146 |
| R-Square | 0.0516 |

^{*}p<0.5 **p<0.01 N=130

Another technique was used to try and capture the proportion of tweets with respect to overall Twitter activity of the country. However, no conclusive results could be found.

APPENDIX H: CREATION OF A CATEGORICAL VARIABLE FOR LOGISTICAL ANALYSIS

| Categorization | | Tin | ne |
|----------------|------|-------|------|
| | | | |
| | | Early | Late |
| | High | 1 | 4 |
| Volume | | | |
| | Low | 2 | 3 |

Again, to capture the countries based on the volume and time period a categorical variable was created using their volume and the time they first Tweeted. The mean for the volume of Tweets was taken as the point of bifurcation for dividing between high volume tweeting country or low. To divide the countries based on early Tweeting countries and late Tweeters, the mean was calculated for month of tweet (first month a country Tweeted). Through this method a nominal variable was created that tried capturing the timing and volume of Tweets.

APPENDIX I: ADDITIONAL ANALYSIS MODEL: BINARY LOGISTIC MODEL

| | Model 1 |
|---|---------|
| Structural and Cultural Position of Women | |
| Gender Inequality | 2.136 |
| Laws for Violence Against Women | 1.3418 |
| Laws for Access to Justice and Workplace Rights | 0.2813 |
| Internet Availability and Accessibility | |
| Ln (Internet Censorship) | -0.8537 |
| Membership to World Society | |
| INCS | 24.7781 |
| Ln (WINGO) | -0.2414 |
| Control Variables | |
| Ln (GDP Per Capita) | -0.09 |
| Ln (Population) | 0.2512 |
| Ln (Overall Twitter Activity) | 0.8381* |

^{*}p<0.5 **p<0.01 N=130

The nominal variable was used to further create a binary variable, the category: 3 (Low and Late Tweets) compared to the rest. While analysis was done using the nominal variable, the binary logistical model was giving a better model. The refence category was category 3 (Low and Late Tweets) (Appendix H). However, still no conclusive answers could be drawn.