Information, politics and government communication: discourse analyses of the U.S. Environmental Protection Agency on Twitter

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Information, politics and government communication:

Discourse analyses of the

U.S. Environmental Protection Agency on Twitter

by

Nicolau Flores Vianna DePaula

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Abstract

Government communication is an important activity for society, during times of calm and times of crises. Moreover, social media have become widespread information and communication technologies for government agencies around the world. In the U.S. federal government alone, there are thousands of accounts on various platforms broadcasting multiple messages a day. However, there seems to be few analyses of government discourse on social media. Although content analyses of the posts of various types of government agencies around the world abound, the categories are narrow to specific events or are agnostic about details of semantics and language structure. In this study I provide a comprehensive analysis of how generic and basic functions of speech, and several relevant features of discourse, are employed in government social media messages. I also assess the role of the political administration in office in influencing characteristics of the discourse. Although it is expected that government agencies will use discourse to communicate their messages and will be influenced by political forces, this seems to be one of the first studies to comprehensively discuss how speech functions of discourse are employed by a government agency on a social media platform; how speech functions relate to government communication purposes; and the role of the political administration in office in influencing various characteristics of the discourse. The empirical component of this study examines the posts of the U.S. Environmental Protection Agency on Twitter over a 2.7-year period. The study shows the distribution of various speech acts and text features over time and across distinct political administrations, and how messages with distinct speech acts, such as directives and participatory requests, relate to distinct goals of government communication, such as crisis communication and self-promotion. Secondly, I show how changes in political administration, in relation to party, ideology and policy objectives, are
reflected in the messages of the agency. I then discuss how other environmental factors, such as bureaucratic and social media characteristics help explain the nature of the government discourse as well. This work provides a window into the mechanics of language use in the context of government social media communication and provides explanations for why this discourse is generated and broadcast to the public.
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# Table of Contents

Abstract ................................................................................................................................. ii  
Acknowledgements ............................................................................................................... iv  
List of Figures ........................................................................................................................ x  
List of Tables ........................................................................................................................ xi  
1. Introduction ........................................................................................................................ 1  
   1.1 Government Communication on Social Media .............................................................. 3  
   1.2 Previous Research and Gaps ........................................................................................ 3  
   1.3 Rationale and Motivation ............................................................................................ 8  
   1.4 Research Questions and Case Study ........................................................................... 12  
   1.5 Dissertation Summary ................................................................................................. 16  
2. The Purposes of Government Communication with the Public ......................................... 18  
   2.1 Modern Executive Government .................................................................................... 20  
   2.2 Communication as the Nerves of Government ............................................................... 22  
   2.3 Mass Media and Government Propaganda .................................................................... 24  
   2.4 Political Quiescence and the News Media ................................................................... 26  
   2.5 Policy Tools, Public Relations and E-Government ....................................................... 29  
   2.6 Language and Discourse Studies ............................................................................... 34  
   2.7 Summary and Synthesis ............................................................................................... 35  
3. A Framework for Analysis of Government Discourse on Social Media ............................. 38  
   3.1 A Brief Discussion on Genre of Discourse .................................................................. 42  
   3.2 Speech Acts .................................................................................................................. 43  
   3.2.1 Directives ............................................................................................................... 45
7.2.3 Negative and Not Positive ................................................................. 141
7.2.4 Only Negative and Not Directive ...................................................... 142
7.3 Associations Between Speech Acts and Government Goals ...................... 143
7.4 Implications of Political Change on Government Discourse ..................... 152
  7.4.1 Frequent Topic terms ........................................................................ 153
  7.4.2 Evaluation of Topic Terms ............................................................... 156
  7.4.3 Hashtag Analysis ............................................................................. 170
8. Discussion .............................................................................................. 175
  8.1 Distribution of Speech Functions and Text Features ............................... 175
    8.1.1 Speech Acts .................................................................................. 175
    8.1.2 Information Representation ......................................................... 184
    8.1.3 Positive and Negative Content ..................................................... 187
    8.1.4 Combined Features ....................................................................... 188
  8.2 Speech Functions and Government Communication Purposes ................ 191
  8.3 The Politics of Government Social Media Discourse .............................. 196
  8.4 Bureaucracy, Social Media and the External Environment ..................... 202
  8.5 An Outline of a Genre of Government Social Media Discourse ............... 206
9. Conclusions ............................................................................................ 211
  9.1 Theoretical Contributions ..................................................................... 211
  9.2 Practical Implications .......................................................................... 217
  9.3 Limitations and Future Research .......................................................... 220
    9.3.1 The Issue of Time and Agency Coverage ...................................... 221
    9.3.2 Size of Twitter Message and Text Focus ....................................... 222
9.3.3  Reliability Measures and Subjectivity ................................................................. 223
9.3.4  Effects of the Communication ............................................................................. 224
9.3.5  Depth of Analysis of Discursive Features ......................................................... 225
9.3.6  Views from Inside the Agency ............................................................................. 226

References ....................................................................................................................... 227

APPENDIX A .................................................................................................................. 275
APPENDIX B .................................................................................................................. 285
List of Figures

Figure 1. Measures of Inter-rater Reliability ................................................................. 109
Figure 2. Total Counts and Percentages of Speech Acts in Each Sample Dataset ............ 122
Figure 3. Total Counts and Percentages of Occurrences of Actors, Statistical and Scientific
           Information .................................................................................................................. 133
Figure 4. Total Counts and Percentages of Occurrences of Positive, Negative and Evaluative
           Features .......................................................................................................................... 136
Figure 5. Total Counts and Percentages of Occurrences of Combination of Features .......... 139
Figure 6. Instances of Appearance of Most Frequent Topic Terms Under McCarthy ........ 154
Figure 7. Instances of Appearance of Most Frequent Topic Terms Under Pruitt .............. 155
Figure 8. Total Count of Posts that Included Each Hashtag Under McCarthy and Pruitt .... 172
List of Tables

Table 1. Purposes of Government Communication with the Public: Agency-Centered .............. 36
Table 2. Purposes of Government Communication with the Public: Citizen-Centered .............. 37
Table 3. General Discursive Functions and Discursive Features of Text.................................. 41
Table 4. Definition and Potential Functions of Speech Acts in the Government Context ............ 44
Table 5. Structures and Features of Information Representation .............................................. 55
Table 6. Discursive Features and Coding Instructions .............................................................. 101
Table 7. Reliability Measures for Binary Discursive Features and Topic Terms ...................... 113
Table 8. Government Communication Purposes Defined for Assessment of Messages ........... 116
Table 9. Association of Directives with Government Communication ................................. 145
Table 10. Association of Question Prompts with Goals of Government Communication ........ 146
Table 11. Association of Participatory Requests with Goals of Government Communication .. 147
Table 12. Association of Commissives with Goals of Government Communication ............... 148
Table 13. Association of Expressives with Goals of Government Communication ................... 150
Table 14. Association of Representatives with Goals of Government Communication ............ 151
1. Introduction

Government communication with the public—communication of the executive agencies of the nation-state and its subdivisions—is an important activity for societies around the world. Executive governments communicate with the public to address health issues, such as the effects of tobacco use and the dangers of unprotected sex (Graber, 2003), and to warn the public about weather events and the quality of public water (Weiss & Tschirhart, 1994). Governments communicate to provide the public with reliable information upon which business and economic decisions are made (Yudof, 1983), and to keep the public informed about how government agencies are using public money. Some form of government communication with the public is necessary to achieve government “transparency” (Fairbanks et al., 2007). It may also be said that government actors communicate with the public to avoid taking blame for problems (Hood, 2011), to campaign for politicians in office (van Onselen & Errington, 2007), and to promote scientific ideas which may be well-intended but proven erroneous (Nissen, 2016; Archer et al., 2017). During pandemics, government actors need to communicate information about the disease, ensure that panic does not ensue, and that citizens follow proper guidelines (Kim & Liu, 2012; Reynolds & Quinn, 2008). The complex and wide-reaching goals of government communication with the public makes this a challenging and valuable activity to study.

Despite the prevalence of government communication on social media, and studies on the adoption and use of social media technologies by government agencies, studies have not provided any comprehensive analysis of the discourse of the messages that government agencies post and broadcast on these platforms. Many studies have used textual features of social media posts or “content” to examine what it is that government agencies are communicating, the purpose of this communication and factors implicating it (DePaula, Dincelli, et al., 2018;
Medaglia & Zheng, 2017; Oliveira & Welch, 2013; Tursunbayeva et al., 2017). However, these studies have largely focused on examining social media as either a channel of “one-way” or “two-way communication”. When more developed frameworks of content analysis are used, the content categories are narrow or conceptualized for a very specific domain or context, such as crisis events or with attention to “e-government services” (Gascó et al., 2017; Hagen et al., 2018; Hofmann, Beverungen, et al., 2013; Mergel, 2013b; Yuan & Gascó, 2018). Despite the linguistic and semiotic phenomenon that is social media use, the literature on e-government has not addressed the discursive aspect of government social media use. Discourse studies focused on government communication have also not addressed the characteristics of these messages, how the discourse relates to goals of government communication, or the dimensions that implicate the discourse on these platforms.

This study provides analyses of various speech functions and features of text of a government agency’s social media messages, based on the major types of meaning in discourse, as developed by frameworks of functional linguistics and discourse analysis (Fairclough, 2003; Halliday & Matthiessen, 2004). I study how these characteristics of discourse manifest themselves in a government social media context, and how these functions and features of text relate to the purposes of government communication with the public. I distinguish these purposes of communication from contextual factors or sources of influence in the communication and examine the role of political party and political ideology in influencing characteristics of the discourse. I also discuss several characteristics of bureaucracy and social media that can help explain the messages and the discourse that comprises it. The empirical analysis is focused on a multi-year investigation of the posts of the U.S. Environmental Protection Agency on Twitter. I suggest that this form of communication may constitute a genre of discourse, influenced by the
bureaucracy, politics and the media, and that can be better understood to improve interactions between citizens, government and the media. This study may also provide a strong foundation for any future study of language and discourse in the context of government use of Twitter and social media more broadly.

1.1 Government Communication on Social Media

Social media have been adopted by executive government departments around the world at a relatively fast pace, being “institutionalized” in the U.S. federal government (Mergel, 2016). Smith (2016) recently counted over 9,000 accounts sponsored by the U.S. federal government across the most popular platforms (Smith, 2016; U.S. Digital Registry, 2018). Out of these, 3,159 accounts were found on Twitter and 3,894 accounts on Facebook (Smith, 2016). From a count for this study, as of November 21, 2019, the accounts associated with the 15 main U.S. federal agencies had approximately 26.2 million followers on Twitter (compared to 8.2 million followers on Facebook) combined, and together have produced over 356,000 “tweets”. Facebook seems to be a more popular social media site for government agencies around the world, especially at the local level (Bonsón et al., 2012; Oliveira & Welch, 2013). However, the main agencies of the U.S. federal government are followed by a larger audience on Twitter. As later discussed, this is perhaps due to the public-orientation of Twitter, compared to Facebook, and its focus for “information-exchange” more than on “social connectedness” (Kwak et al., 2010; quoted terms from Lin & Qiu, 2013; see also Shapiro & Hemphill, 2017).

1.2 Previous Research and Gaps

Despite the prevalence of government communication on social media, and a large quantity of studies on the phenomenon, it seems that the discourse of the messages has been given no or little attention by e-government, communication, or discourse scholars. There are
various disciplines and literatures that have examined the process of “government communication” and more specifically government communication with the public: political science (Edelman, 1971, 1976); law (Yudof, 1979; Yudof, 1983); political communication and public relations (Horsley et al., 2010; Waters & Williams, 2011); e-government, public administration and information systems (Hood, 2011; Hood & Margetts, 2007; Medaglia & Zheng, 2017; Mergel, 2013b; Yuan & Gascó, 2018); public health (Tursunbayeva et al., 2017); and linguistic and discourse studies (Hansson, 2017). As Hansson (2017) summarizes, these literatures take either a more “administrative” (e.g. public relations, public administration) or more “critical” (e.g. political science, discourse studies) approach. Nevertheless, they all seem to agree that government communication is a tool; an instrumental and strategic activity based on the choices of government actors, but which can also be influenced by various factors or contexts.

A recent comprehensive review by Medaglia and Zheng (2017) of the research on government and social media shows how analyses of the “content” of posts have been carried out. Having examined 93 articles, from the “leading and high-quality journals” associated with the information systems, public administration and e-government literature, Medaglia and Zheng (2017) find “six focus categories” of empirical research on the connection between “social media” and “government”. These include: “platform properties”, “management”, “user characteristics”, “user behavior”, “context” and “social media effects”. Under “management” they find the category of “content generation”, which is one of the most-researched areas. Concerning this practice, most of the research was found to be examining the amount of posting by and across government agencies, or the “level of interactivity” (p. 501) that the content of the posts reflected. Medaglia and Zheng (2017) write that:
In this perspective, content produced by government actors is consistently found to be mainly aimed at self-promotion and political marketing, rather than at increasing transparency, participation and service delivery, regardless of whether the posters are local governments … police departments, … embassies, … national committees, or individual politicians. (p. 501, citations in original text not included here)

The research thus far shows that government agencies in distinct contexts, including in the context of environmental communication (Lee et al., 2018; Lee & VanDyke, 2015) and public health (Tursunbayeva et al., 2017), among agencies more generally use social media in a mostly “one-way” manner for “information provision” (DePaula, Dincelli, et al., 2018; DePaula & Dincelli, 2016; Hofmann, Rackers, et al., 2013; Medaglia & Zheng, 2017; Mergel, 2013a; Tursunbayeva et al., 2017) and for the promotion of the agency — where “self-promotion” refers to the agency or main politicians heading the government agency or account at question (DePaula, Dincelli, et al., 2018; Lappas et al., 2018; Medaglia & Zheng, 2017).

However, although it is clearly understood that social media are mostly used by government agencies for this purpose of “information provision” and “promotion” there have been no studies of how information and promotion are characterized in language to do that. At the same time, many studies assume that any posting behavior by the government agency on a social media site refers to “transparency” (Bonsón et al., 2012; Guillamón et al., 2016; Meijer & Thaens, 2013; Mergel, 2013b; Oliveira & Welch, 2013; Tursunbayeva et al., 2017). In all, there has been little attention on how language and rhetoric characterize the messages of government agencies on social media sites, and how language is used to accomplish the various distinct goals of government communication with the public. The literature on government social media has not yet provided a full analysis of the discourse of the messages government agencies are
constantly broadcasting on these various channels, and such an analysis could help us better understand and help improve this phenomenon.

Studies of government posted content have been largely concerned with whether or not the content is either “news or updates” or involves some reference to “participation or collaboration”, to fulfill the “ideals of web 2.0” (Chun & Luna Reyes, 2012; Criado et al., 2013; Medaglia & Zheng, 2017; Reddick & Norris, 2013). Although there are studies that have examined other content categories that are closely related some type of text analysis, such as analysis of “topics” of the information, or differences between “informal” and “formal” language (Bellström et al., 2016; Denef et al., 2013; Gascó et al., 2017; Yuan & Gascó, 2018), these studies do not examine speech functions or other relevant text features in the day-to-day messages of government agencies. Moreover, few studies have focused on the U.S. federal government, and they do not examine the influence of the political administration on the nature of the government discourse.

The well-cited study of Denef et al. (2013) on regional police departments during riots in England in 2011 is an interesting and exemplary case. In this study they propose that there was an “instrumental” and an “expressive approach” that characterized the Twitter communication of the distinct police departments examined during the riots, and the authors discussed the benefits and challenges of each approach to the communication. They infer these distinct approaches based on distinguishing between “formal” and “informal language” used, and whether the tweet is directly addressed to a specific user or not. They also suggest they coded the content for “content” and “function”. Moreover, they “used open coding … to identify topics such as advice, refute rumors, or success story.” (Denef et al., 2013, p.3, emphasis on original).
This was an interesting study about a particular use of social media during riots. But like other studies related to government use of social media and government communication, it does not provide a fuller linguistic analysis of government communication on social media per se. This may not have been their purpose. But they use terms that are formalized and theorized in other domains (e.g., discourse studies) in a highly informal way. For example, in studies of semantics “advice” is not a “topic”; it is an entirely different category of meaning and discursive action (Fairclough, 2003). Moreover, their language categories are focused on the context of communication about riots, and not on the daily and recurrent use of social media.

A number of studies have examined government social media texts, often focusing on local and regional governments (Bonsón et al., 2015; DePaula & Dincelli, 2016; Hofmann, Beverungen, et al., 2013; Yuan & Gascó, 2018; Zavattaro et al., 2015). Moreover, these studies have developed ad-hoc content categories to suit their particular purposes. For example, in the study of Bellström et al. (2016) their categories for government content analysis included: “marketing service”, “sharing information”, “complaining about the municipality”, “expressing opinion”, “praising the municipality” and others. These categories, however, do not provide a framework to understand linguistic characteristics more broadly across different types of government agencies or to serve as a linguistic framework for analyses in various agency contexts. Moreover, they seem to offer a number of logical problems. For example, is it not the case that all posting action is “sharing information”? There is no special exploration of the meaning of “sharing information”. Also, is it not the case that “praising the municipality” is also “expressing an opinion”? These issues are often not explained.
1.3 Rationale and Motivation

Why study comprehensively the discourse of government agencies on social media? Why the need to relate specific textual features of this discourse to government purposes? Why examine the contextual factors and the role of politics on the government discourse? Most research on government use of social media has been carried out under e-government studies as an issue of “technology adoption” and a provision of e-government services (Bonsón et al., 2012, 2017; Chun & Luna Reyes, 2012; Criado et al., 2013; Hofmann, Rackers, et al., 2013; Medaglia & Zheng, 2017; Mergel, 2013a; Oliveira & Welch, 2013; Clayton Wukich & Mergel, 2016). However, there has been less attention to the communicative aspect of this process, and in particular the linguistic aspect of the use of social media technology. This is the case even though government use of social media is largely a communicative and linguistic phenomenon. Most research in this domain has investigated the communicative process as a matter of “push” and “pull” of information (Medaglia & Zheng, 2016; Meijer & Thaens, 2013; Mergel, 2013a, 2013b; Tursunbayeva et al., 2017). However, it may be useful to make a deeper analyses of the messages to better understand the meaning of “information”; how goals of government communication, such as “transparency” and “democracy” relate to linguistic patterns; and how political, bureaucratic and media forces interact to shape the discourse. Although scholars of government communication and government discourse have examined distinct aspects of the communication of bureaucratic agencies and government actors (Hansson, 2015a, 2015b; Hood, 2011; Sanders & Canel, 2013), it seems no attention has been given to investigations of the discourse of government social media messages.

Government agencies use social media to a considerable degree, which require a considerable amount of human energy and resources. Social media use by government agencies
has the potential for abuse and waste, but also for better communication with citizens. Understanding the discourse of the messages that government agencies are generally broadcasting on these platforms, may thus provide explanations for what is being discussed, how messages are composed and expressed, the factors that implicate the characteristics of these messages, and the purposes for which the messages are being adopted. This knowledge could improve our theories about social media use in government, and potentially improve the relationships between government communicators and citizens, at least in the extent to which government agencies and citizens are better able to interpret and explain the messages. This is not an ethical study, and therefore recommendations concerning what is best for government communication is not explored. Nevertheless, I hope that this knowledge can be used to improve government use of social media, government relations with citizens, and citizen understanding of government information and communication activities.

For theory of government communication and government use of technology, the main rationale for this study is to provide a basic and foundational analysis of the discourse of government agencies on these social broadcasting sites; to investigate what these messages mean; to understand how they are associated with goals of government communication; and to articulate and demonstrate the sources of influence on the discourse. Being able to explain and understand the purposes of government communication with the public is important because it provides a standard or criteria with which to judge the communicative and discursive activities of government agencies. Therefore, understanding the association between textual features and communication purposes, enables us to assess the meaning of this activity as an assessment of the quality of government messages for their potential goals. Moreover, it is important to understand the environmental factors or contextual sources of influence on the discourse, such as
the political, bureaucratic and media contexts in which this communication unfolds, as these causal factors are potentially defining features of the messages and the discourse. Lastly, the interdisciplinary approach of this study brings together several literatures on government communication, and integrates views from the disciplines of discourse analysis, communication, public administration, political science and e-government.

Let us look at an example of a couple of Twitter messages, to understand the types of questions that this study may answer:

Are you prepared? Learn ways to reduce risks to #health and the environment due to natural #disasters http://...

EPA has proposed to repeal the #WOTUS Waters of the United States rule, thus providing farmers and landowners regulatory certainty.”.

What do these posts mean? What type(s) of speech functions is(are) adopted? What can be inferred from this message regarding the “purposes” of each message? What information is provided? How is the agency presented or framed in the message? To what extent are external actors (others) referred to? Tools to reasonably and rigorously address these questions are adopted here for a foundational analysis of the discourse of government agencies on social media. The framework of discourse analysis as discussed here enables us to analyze social media messages, and better understand the relationship between specific discourse categories with government purposes, such as information provision, accountability, blame-avoidance, networking etc. (Bonsón et al., 2015; Fairbanks et al., 2007; Hansson, 2015a; Mergel, 2013b), as well as political and managerial considerations of government agencies, such as the language of reputation management (Gascó et al., 2017; Sanders & Canel, 2013) or how government
agencies use language to promote the ideologies of the administration in power (Boutyline & Willer, 2011; Grafton & Permaloff, 2005; Hansson, 2017, 2018).

This seems to be one of the first studies to examine in detail the various discursive characteristics of the long-term, routine communication of a U.S. federal government agency on Twitter. This study provides an initial and comprehensive analysis of how government agencies may use language to construct and articulate their messages on these social broadcasting platforms. Given the novelty of this study, this seems to be the first study to examine in detail the environmental factors that may influence government discourse on social media. In particular, I examine the role of political party and political ideology on government discourse and government social media messages, namely on the posts or tweets. Although I do not empirically assess all theories and explanations about all major sources of influence on the potential discourse of government agencies on these types of platforms, I also consider in this study, and discuss at length, characteristics of the bureaucracy (as a managerial and organizational activity) and characteristics of social media (as a social broadcasting and semiotically rich activity) as relevant contexts and factors to explain the phenomenon.

Another motivation for this study was the potential for government posts or government messages on social media to reflect a novel and unique genre of discourse. Although I do not explore and compare empirically how the discourse of government messages are expressed in other types of channels, such as TV and newspaper, social media clearly create restrictions and “affordances” of its own for the nature of messages on their platforms (Bucher & Helmond, 2017; Chen et al., 2016; Dincelli et al., 2016; Harrison et al., 2017; Soroka et al., 2017; Sunstein, 2017). Ultimately, the results of this study provide justifications and guidelines for constructing an outline of government social media discourse, or at least of Twitter discourse of a U.S. federal
government agency. Results of this study may corroborate previous studies that have examined this phenomenon and provide novel insights about discourse and rhetoric in this multi-faceted and growing context of social communication.

1.4 Research Questions and Case Study

The research questions of this study have been formulated to address a set of three empirical questions, which are stipulated as follows:

**RQ1.** How does a U.S. federal government agency on Twitter use basic functions and features of discourse?

**RQ2.** How does the use of discursive functions relate to specific purposes of government communication with the public?

**RQ3.** What are the implications of change in political administration for the nature of the discourse? In particular, what is the influence of political party and political ideology on characteristics of the discourse?

To carry out the empirical investigation, I have selected to study the use of Twitter by the U.S. Environmental Protection Agency under the Obama and Trump administrations. Twitter is selected for a number of reasons—compared to Facebook, the other major social media and social network site. I also refer to these platforms as *social broadcasting sites*, since much of the communication is broadcast, and not necessarily dialogic. In particular, Twitter is selected for this study due to the fact that Twitter has an overall higher number of followers in the arena of U.S. federal government communication, and that Twitter is generally a more open and public-oriented platform than Facebook. The rationale for the case study is further elaborated in Chapter 5. Similarly to Facebook—and unlike various other more content-specific social media sites, such as LinkedIn (i.e. professional content), Instagram (i.e. pictures) and YouTube (i.e.
videos)—Twitter enables the user-generated post to contain links, images and/or a video, along with hashtags or references to other Twitter posts or “tweets”. However, Twitter is relatively specific in that it now restricts the number of characters per message to 280 (initially set at 140 characters). As such, the “message” that may be inferred from a single tweet can be derived from any of these elements and it may be relatively brief.

The framework of analysis adopted in this study is built on theories of text and discourse analysis (Fairclough, 2003), as well as theories of knowledge and information representation (van Dijk, 2014) and the language of evaluation (Martin & White, 2005). It identifies what I refer to as the basic, generic and explicit functions and features of discourse. The framework adopted here is largely based on theories from systemic functional linguistics, or SLF (Fairclough, 2003; Halliday et al., 1989; Halliday & Matthiessen, 2004) and discourse theories developed in the work of others (Austin, 1962; Searle, 1969; Martin & White, 2005). This work is thus based on studies of linguistics and discourse analysis to be applied to the domain of government use of social media. Although the framework makes various ontological and epistemological assumptions that are not discussed here, the reader is invited to explore these issues in her time. Ultimately, this study is largely based on the lexico-grammatical components of the written text. Future studies may further examine the various semiotic elements of meaning making in this context (e.g. Jovanovic & Leeuwen, 2018).

To understand how government communication goals are expressed via distinct speech functions and features, I aggregate and synthesize various views from the government and political literature about the goals of government communication with the public. Like Sanders and Canel (2013) I propose two sets of purposes, some that are more agency-centered and some that are more citizen-centered. I consider these purposes of communication as a type of “end
cause”, that is, “that for the sake of which” a thing is done (Aristotle, 1941, p. 241). I distinguish these from, and discuss, the environmental factors or contextual attributes of government agencies, which may be considered an “origin” or a “material cause” of the discourse in Aristotelian terms (Aristotle, 1941, p. 241).

There are many environmental factors, contexts or sources of influence that likely impact how a government agency will communicate with the public, on social media or other channels of communication (Graber, 2003; Liu & Horsley, 2007). Studies have identified a number of relevant factors and explanatory concepts, such as legal frameworks, management support, media scrutiny, politics, professional development, resources, culture and others to explain the different contexts and sources of influence of how government agencies communicate with the public (Graber, 2003; Levenshus, 2016). In this study, I empirically assess the role of the political administration in power, but also discuss the potential influence from bureaucracy and the media channel itself. Ultimately, the set of environmental factors bearing on the discourse are discussed here under the media, the bureaucracy, and the politics.

Social media format restricts the basic structure of messages, such as length, multi-media features possible, frequency of messages allowed, etc., which may have an impact on the configuration of the discourse. Moreover, social media practices and norms for increasing popularity, virality and connectivity may also influence the discourse. Characteristics of the bureaucracy, including bureaucratic mission and bureaucratic stability may also influence some patterns of the discourse. Lastly, the political party and political ideologies of the administrations in office may influence the discourse, since top administrators may dictate what information should or should not be discussed on the platform and how they are discussed. Given the nature of the data for this dissertation, the study is empirically focused on exploring the political
dimension more directly. Nevertheless, this study integrates various factors and explanations, and provides a novel and comprehensive study that assesses the many dimensions of U.S. federal government communication on Twitter.

The U.S. Environmental Protection Agency is an interesting and useful agency to examine given its complex nature as a bureaucratic and regulatory agency, an environmental and scientific agency, as well as an agency that has been considered relatively political (Ringquist, 1995; Daley & Layton, 2004; Schwartz, 2017). We thus find in this organization a relevant context in which to study how textual features of the content communicated relate to various types of contexts and government purposes. Although the agency account is not the most followed on Twitter, it was relatively active during the McCarthy administration as well as the Pruitt administration. In addition, in the U.S. this is *the first major change of political administration in the federal government in the age of social media in government*: the transition between President Obama to President Trump. Most social media sites in the U.S. federal government were initiated in 2008, 2009 and thereafter, many of which as a response to Obama’s Open Government Directive (Mergel, 2013a; Obama, 2009) signed into law in his first day in office. This is thus the first opportunity to examine how communication on social media has changed in the U.S. federal government as a response to substantial changes in political administration at the federal level.

To address RQ1, I employ a descriptive and quantitative assessment, where I carry out a what may be called a quantitative content analysis of discourse categories of the “posts” or “messages”. This analysis is carried out with another coder/annotator, and measures of reliability in coding are assessed. The second and third research questions are more interpretive. To address RQ2, on how discursive functions (which I also refer to as *speech functions* or *speech acts*) relate
to government communication goals (or government communication purposes), I personally code various messages in terms of the goal or purpose the message seems to be pursuing, and observe how the extent to which specific speech functions are associated with these distinct goals. For RQ3, to determine the impact of changes in political administration on the nature of the discourse, I compare the various discursive functions and features of the messages across the two distinct administrations, and also provide a more detailed analysis of how the political party and political ideology of the administration in office, likely influenced the topics discussed, aspects of the rhetoric surrounding these topics, and the hashtags employed by the agency. The comparison across two distinct political administrations shows some of the implications of change in politics, ideology and policy objectives on the agency’s discourse.

1.5 Dissertation Summary

This document proceeds as follows. In chapter 2, I provide a review of the literature on government communication, identifying and summarizing various “goals” and “purposes” of government communication with the public. This chapter is intended to provide an encompassing overview of the literature, and to establish communication goals with which to analyze social media messages. In chapter 3, I discuss the framework of discursive functions and features to be observed from the messages. This chapter is divided into three sections, following the three major types of meaning developed in systemic functional linguistics: action, representation, and identification. In chapter 4, I discuss three broad environmental factors or contexts that are likely necessary to understand government discourse: the media, the bureaucracy, and the politics. I discuss specific characteristics of these domains focusing on characteristics that may influence the discourse of the agency.
In chapter 5 I provide the rationale for studying the EPA on Twitter across the two administrations selected. This includes a review of the nature of the EPA, the nature of Twitter, as well as previous legal and political issues concerning the use of social media by the EPA, namely the assessment of GAO (2015) that the EPA was involved in “covert propaganda” and “grassroot lobbying” in their use of social media sites during the Obama administration. I also discuss known policy objectives of the two administrations studied, of Obama and Trump, as reported in the mainstream media. In chapter 6 I discuss the methodology, which explains in detail the data sources, the coding framework, the tasks and coding rules, measures of reliability, and the approaches to analyses. In chapter 7, I present the empirical results, which address the research questions above. In chapter 8, I further discuss the results in relation to existing theory. In chapter 9, I provide conclusions concerning the theoretical and practical contributions, some limitations and directions for future research.
2. The Purposes of Government Communication with the Public

Government communication with the public is perhaps one of the oldest topics of philosophy and scholarship, considering the works of Aristotle and Cicero on rhetoric and politics from European antiquity. However, perhaps surprisingly, in the contemporary literature government communication—public and organizational communication of the executive agencies of the modern nation-state, and its subdivisions—is not a frequently studied topic in the administrative, political or communication sciences of the present, at least not by this specific term. Canel and Sanders (2012), for example, have written that “despite its key importance for twenty-first century politics, the topic of government communication has been a neglected area of scholarly interest” (p. 85). This is perhaps unfortunate, given the importance of bureaucratic and executive government institutions for contemporary society, as well as the prevalence and importance of the processes of public communication.

Nevertheless, there is a rich literature in the modern social sciences that address issues related to modern bureaucracies, democratic politics, information and communication technologies and aspects of government communication with citizens, including the role of media technologies and of language in the context of public agencies (Edelman, 1976; Graber, 2003; Hansson, 2017; Jacobs, 2011; Sanders & Canel, 2013; Wodak, 2000; Yudof, 1979). This existing work may be useful for making sense of how and why government agencies are communicating with the public via the novel social media and social networking sites, such as Facebook and Twitter. In this Chapter, I review the relevant literature on the purposes and goals of government communication with the public. This chapter serves to provide a background on the literature on this topic and also to help address the research question concerning the
relationship between functions of language and the functions of government communication with the public.

The “purposes”, “goals” or “functions” of government communication refer to the normative goals toward which their activities are said to aim, as well as the aims toward which they are brought to in practice. As such, the purposes of government communication with the public may involve the acceptance of certain beliefs, the implementation of certain principles, or the effecting of certain states of affairs (Edelman, 1976; Yudof, 1979). However, these should not be confused with the “sources of influence” or “contextual factors” of the communication. The function or purpose of something may indeed be a “causal factor”, since it is a driver for actions and outcomes. However, functions as causal factors are an “end” type of cause, in Aristotelian terms, or the thing “for the sake of which” an action is carried out (Aristotle, 1941, p. 241). In this study, this end or “final cause” is distinguished from “environmental” and “contextual factors”—which may more closely correspond to Aristotle’s “material cause”—and are further discussed in Chapter 4.

In this chapter, I focus on identifying and synthesizing the purposes, goals and functions (terms I use interchangeably) of government communication with the public from various literatures (e.g. sociology, communication, political science, linguistic, etc.). I provide Table 1 below, in Section 2.7, as a summary and synthesis of these purposes. I organize these purposes, or goals, based on whether the purpose may be conceived as more agency-centered or more citizen-centered, similarly following the work of Sanders and Canel (2013). First, I review some explanations on the goals and nature of modern executive government itself.
2.1 Modern Executive Government

For an analysis of government communication, it is useful to first establish that the communicative purposes of government derive from how one conceives of the nature of executive government, which we may define as an abstract social structure, and related physical elements, that operate in the domain of law execution in the political domain of human organization. Moreover, executive government is here considered as a public institution, with implicit and explicit rules, and with personnel, including those who are politically appointed (“in office”, and usually “in power”) and those in a career dependent on professional merit rather than public elections (Weber, 1968). Despite novel “transformations” in government of the late 20th and the beginning of the 21st century (Byrkjeflot & Engelstad, 2018), executive government is still the branch of government which has the ultimate authority of implementation of violence (e.g. via police and military), as well as the various actions of “public management” that have become characteristic of the modern nation-state, and the so-called “welfare state” (Andrews et al., 2005; Frader, 2018; Jensen, 2019).

Executive governments of our time are associated with, and defined by, the modern bureaucracy. In the turn of the 20th century, Max Weber recognized that the laws and regulations of nation-states were increasingly carried out by bureaucracies—highly rational social institutions, with detailed information management and efficient execution of laws and mandates—which were a defining component of modern government. Weber (1968) writes:

> Precision, speed, unambiguity, knowledge of the files, continuity, discretion, unity, strict subordination, reduction of friction and of a material and personal costs—these are raised to the optimum point in the strictly bureaucratic administration … (p. 973)
Bureaucratic government—that is, “agencies” or “organizations” operating as a set of government units of a polity or society—was thus an organized and efficient means to implement the laws and regulations of the nation-state and its subdivisions. As they developed along with modern bureaucracies in the turn of the 19th to the 20th century, information and communication technologies (ICTs) were important components of these agencies, and both developed in tandem with the capitalist market economy (Beniger, 1986). The speed and maximization of capitalist production and commerce, employing the novel ICTs, meant an increase in the speed of economic activity broadly, which included an increase in the speed of public and mass communication. Weber (1968) writes:

Today, it is primarily the capitalist market economy which demands that the official business of public administration be discharged precisely, unambiguously, continuously, and with as much speed as possible. …

The extraordinary increase in the speed by which public announcements, as well as economic and political facts, are transmitted exerts a steady and sharp pressure in the direction of speeding up the tempo of administrative reaction towards various situations. (p. 974)

Weber recognized that, within the physical and material power of governments, there resided a “symbolic power”, in the terms of Bourdieu (1991), the power to effect individual and group behavior by defining and interpreting concepts, usually within an ideological framework. For example, in “democratic domination”, in Weberian terms, the person with actual empirical authority was considered a “servant” of the public in common discourse, based on the belief that in a democratic system the common folk, not the officials themselves, are the ones who have authority. Weber’s theory of government thus established our understanding of executive
government as existing on the basis of the threat of physical violence, symbolic power, and bureaucratic precision and regulation (cf. Warwick & Meade, 1980).

Despite his attention to ideology and symbolic power, Weber only observed the beginnings of the relationship between government agencies and public communication via mass media and did not develop theories of language and discourse in the public bureaucracy. Nevertheless, his theory of bureaucracy holds relevant and revealing to this day, and many others have come to task to theorize the phenomenon of government communication in the age of information systems and mass media.

2.2 Communication as the Nerves of Government

From a different, although related, tradition of Max Weber, the work of Karl Deutsch, in *The Nerves of Government* (Deutsch, 1963), explored the importance and mechanics of government communication within the overall system of social interaction with technologies. This work has been noted as the most cited work on “government communication” (Sanders, 2011). Graber (2003) has written that this work is “the classic and still best example” (p. 15) of how information and communication in political systems and systems of governance guide their operations, emphasizing a “systems perspective” to questions of political and government communication. The framework focuses on a terminology of mechanical analogies, adopted from the “cybernetic” framework, developed by Norbert Wiener. Cybernetics applied concepts from mathematics, physics, engineering and psychology to characterize an overarching framework that describes communication in both humans and the machine. Given the popularity of the cybernetics perspective in technology-oriented disciplines, as well as the related elaborations concerning the goals of government activities, it may be worth to summarize here some of its ideas. According to Deutsch (1963):
Communication is the cement that makes organizations. Communication alone enables a group to think together, to see together, and to act together. All sociology requires the understanding of communication.

What is true for the unity of a group of people, is equally true for the individual integrity of each person. The various elements which make up each personality are in continual communication with each other and affect each other through control mechanisms which themselves have the nature of communication.

Certain aspects of the theory of communication have been considered by the engineer. While human and social communication are extremely complicated in comparison to the existing patterns of machine communication, they are subject to the same grammar; and this grammar has received its highest technical development when applied to the simpler content of the machine. (p. 77)

Cybernetics establishes that, within the overall social system, which includes humans, organizations and technologies, communication is the most important mechanism, since it creates the connections among the parts, and it is the activity through which control—or, synonymously, power—itself is implemented. According to this framework, Deutsch sees government not as an entity but as a “process of steering”, similarly to the steering of a ship, which is characterized by three important processes: feedback, goal, and purpose. Feedback is the process of learning from sensory experience and responses from the environment. Goals are targets for situations that the system should be in, vis-a-vis the outside world, which lower internal disequilibrium (p. 184). Purpose in this framework refers to “a major or strategic goal, preference, or value that is to be pursued through a set of intermediate movements toward intermediate goals or avoiding intermediate obstacles” (p. 187).
According to Deutsch (1963), government agencies may be observed as machines that are connected to and respond to communication from other environments. Deutsch also refers to a degree of “control” in the system: human conscious agency that recognizes what it is doing. However, although Deutsch provides a very detailed analysis of the mechanics of government communication, especially and properly so in relation to other social systems, there are substantial questions left unaddressed by that work and the overall cybernetics framework. For example, how often do or should government agencies communicate with the public? In which occasions do they do so, or not? Which topics or groups of society appear in the government communication? Why? How do political parties frame or control the information communicated by bureaucratic government? The work of Deutsch, although deserving of mention here as it establishes concepts of goals and purposes in government communication, does not address which goals or purposes are adopted by certain governments, and why they may be the case. Nevertheless, as summarized below, other studies took up the task.

2.3 Mass Media and Government Propaganda

Some of the first studies to more explicitly examine the purposes and functions of government communication with the public, especially with “content analysis” of messages broadcast by government agencies via mass media (e.g. newspapers, radio) come from the work of Harold Lasswell and others (Lasswell et al., 1965; Lasswell et al., 1969) in the first decades of the 20th century. These individuals essentially established the modern field of political communication. Similar to the turn to the 21st century, the turn to the 20th century was accompanied by a number of breakthroughs in communication technologies, including the telephone, the radio and then, in the 1920s and 1930s, television (Beniger, 1986). Although, as Laswell et al. (1969) noted, the use of “political propaganda or public instruction” has been an
activity as old as the verses of Solon of Athens (494 B.C.), and campaigns of Alexander the Great and Julius Caesar to influence public attitudes (pp. 6-7), social theorists of the early 20th century recognized the importance of modern propaganda and public communication in the context of the growth of mass media and communication technologies.

In their work, Lasswell et al. (1969) conceived of propaganda as “the management of collective attitudes” and suggested that “anybody who uses ‘representations’ to influence collective responses is a propagandist” (p. 4). Although the term propaganda began receiving strongly negative connotations from its use in the World War I context, to refer to “enemy propaganda”, Laswell and others often treated the term in a relatively neutral way, suggesting that terms such as “propaganda, pedagogy, education, contagion, news, publicity, and advertising” had been used in “intercrossing” ways by individuals in different periods and contexts, and with both similar and distinct connotations (1969, p. 4).

However, Lasswell et al. (1969) proposed that propaganda could be distinguished from the process of communication itself, where they also suggested that propaganda involved the “transmission of attitudes that are recognized as controversial within a given community” (p.3, emphasis on original); that while some news could be propaganda, not all propaganda is news; and that education and pedagogy differ from propaganda in their focus to initiate or transmit “skills”. Although the term has fallen out of favor with many scholars to refer to government communication, perhaps given the largely beneficial nature of government communication with the public, government propaganda—as spin or deceitful communication—is still a characteristic of government communication (El-Khalili, 2013; Herman & Chomsky, 1988; Hood, 2011; Huang, 2015).
2.4 Political Quiescence and the News Media

The symbolic and propaganda roles of government agencies continued to be explored in social science research, and within the fields of communication and political science. Some of the most cited work in this area is the work of Edelman (1971, 1976) exploring the “symbolic uses of politics”—the extension to which political opinion and behavior is affected by rituals, interpretations of facts, and conceptualizations based on fears or hopes. Edelman (1971, 1976) examined various relationships concerning the use of symbols and language in politics, including psychological theory and theories of political leadership. Much of the argument of Edelman was that “symbolic reassurance” from government officials is sufficient to achieve “political quiescence” by the population, which was in turn sufficient to also satisfy politicians and government officials.

Edelman explored details of language and perception in government communication—although not using the term “government communication”, but largely exploring the interplay of administrative agencies, politics and the mass public. He wrote:

The employment of language to sanctify action is exactly what makes politics different from other methods of allocating values. Through language a group can not only achieve an immediate result but also win the acquiescence of those whose lasting support is needed. More than that, it is the talk and the response to it that measures political potency, not the amount of force that is exerted. (Edelman, 1976, p. 114)

Edelman also made the observation that the power of talk does not come from any potency that exists in the words themselves but in the “needs and emotions in men”. Moreover, political action is considered an action of groups, and individuals in certain groups and certain roles have predictable responses to particular information, such as how the Defense Department
official may react to statements regarding how high military budgets promote peace (Edelman, 1976, p. 115). In politics, accuracy is not the name of the game; what is important is how groups (i.e. audiences; stakeholders) appraise or are emotionally affected by certain signs or symbols (e.g. certain expressions, discursive techniques, topics, etc.). Particular words can become associated with certain threats or reassurances to certain groups, and unconsciously people may carry out “reification” of abstract processes, as if terms such as “increasing national security” and “improving public welfare” have a specific and objective meaning to most people or most groups of society.

In this understanding, the purposes and functions of government communication are essentially to create a satisfactory interpretation of reality by the most relevant groups. As such, the concept of the bureaucracy as an “administrative system” with rigid rules, since in practice government is more about an informal game of interpretation of rules, and not strictly a rational and absolute following of rules (Hood, 2011). Moreover, the groups that win the language game are the ones which usually already have higher economic privilege and better access to linguistic resources—such as lawyers who can defend interpretations of laws. However, to understand language use in the government context it is important to recognize that communication is often carried out to various audiences and understanding the “meaning” requires understanding how people react to certain terms, phrases and narratives. Ultimately, to Edelman, the purposes of government communication are shaped by changes in political goals, but generally serve to induce fears or emotions in support of an action, or to induce quiescence of groups who can mount a protest.

The famous work of Herman and Chomsky (Herman & Chomsky, 1988) built on the political and propagandistic roles of government agencies as previously developed in the
literature—with an added dose of criticism—to discuss what, why and how the news media industry communicates what it does. Herman and Chomsky (1988) suggested that the need by the media industry—the major newspapers and TV stations—for a steady flow of news, combined with the large number of government public relations officials who provide special access and content to journalists, creates incentives for a “symbiotic relationship” between the mass media industry and government officials (p. 19), where they work together to “set the agenda” (McCombs & Shaw, 1972) of what the population knows about and thinks about in the context of politics. Moreover, the assumption that government information is credible, originating from an interpretation of the bureaucracy as focused on facts and accurate information, and having official authority, elevates the value of government-derived information for news agencies. In their work, Herman and Chomsky (1988) show how the news media industry prioritize certain narratives that sustain established powers (e.g. existing economic elite, large communication corporations, etc.) who work in a more or less collaborative way with the government. Herman and Chomsky (1988) seem to conceive of government communication as largely used for propaganda and “spin”.

In the discipline of political communication, the role of the media industry has also been recognized as one of “gate-keeping”, where news programs and writings provide some moderation or influence on government content communicated to the public (Bennett, 2004; van Leuven & Joye, 2014). As Entman (2007) has argued, the role of the media in framing and overall creating “bias” in the information and communication provided to the public content depends on the particular issues. Moreover, generally, the media is biased against minorities (Entman & Rojecki, 2001; Kang, 2004) and show a bias toward U.S. foreign policy communicated by the government (Entman, 2009; Herman & Chomsky, 1988). Given this
source of power and ability to control or influence media content, government agencies have been interpreted to carry out communication with the public to “manipulate” the message and to “hold on to” and “to exert power” (see also Franklin, 2004; quoted terms from Hansson, 2017).

Given the prevalence of communication technologies, some scholars have examined the role of the “mediatization” of public bureaucracies and the impact that constant communication in the general population have on the functions of government communication. News organizations may not always be in support of government activity, and indeed may provide interpretations of government as dysfunctional and incompetent (Thorbjørnsrud, 2015). As such, the functions of government communication have been considered as one of “media management” and involving “reputation strategies” (Esser, 2013; Thorbjørnsrud, 2015), which may be needed to “counter-act the media” or “overcome negative media coverage” (Liu et al., 2012). In either case, the presence of the media as a separate industry creates a mediating factor to be considered in the government communication with the public. In an environment with independent and distinct media, the purposes of government communication with the public may be shaped by the characteristics of the medium or the channels themselves.

2.5 Policy Tools, Public Relations and E-Government

Another tradition of perspectives on the purposes of government communication come from studies of public administration, e-government and contemporary studies of public relations. These perspectives emphasize communication as policy “tools”, “instruments” and as forms of “strategic communication” (Graber, 2003; Sanders & Canel, 2013; Hansson, 2017) or a type of “reputation management” (Gascó et al., 2017). In these perspectives, issues of power and control are not criticized to a large extent (Strömbäck & Kiousis, 2011)—probably since these scholars are interested in how this power may be best implemented. Whatever the case, one of
the early works to develop this tool and policy-oriented perspective of government communication with the public is the work of Hood (Hood, 1983; Hood & Margetts, 2007). Hood (1983) conceived of government communication as one of the four “basic type of government tool[s]” and as a “resource”, which he referred to as “nodality”—having a “strategic position from which to dispense information, and likewise [enable] government to draw in information for no other reason than that it is a centre or clearing-house” (Hood & Margetts, 2007, p. 6).

Built on concepts from Hood (1983), Adler and Pittle (1984) and others, Howlett (2009) proposed that the tools and purposes of government communication may be either “procedural” or “substantive”, and at the “back-end” or “front-end” of the policy cycle. Substantive front-end communication includes “news and notification instruments” and “moral suasion”, such as consumer labeling and e-government portals. Procedural front-end tools include the laws that enable this to happen (e.g. freedom of information laws). Substantive back-end tools include “exhortation and information campaigns” (e.g. government advertising), and procedural back-end tools refer to “data collection and release” (e.g. census, government websites). In this framework, which I think could be considered mechanistic but not semantically rich, the “front-end” stage refers to the agenda setting and policy formulation stages of the policy life cycle, where “back-end” refer to the policy implementation and policy evaluation. The framework may seem counterintuitive—i.e. “back-end” processes give the impression to be either in the beginning or behind the eyes of the public, but are not conceived as such in the framework of Howlett (2009). Nevertheless, this reformulation of the Hood (1983) model emphasizes some important mechanics of government presentation, concepts associated with theories of self-presentation developed by Goffman (1959).
Frameworks of administrative and strategic communication have considered government communication on social media as having purposes or goals of “public relations”, “impression management” and “reputation management” (DePaula, Dincelli, et al., 2018; DePaula & Dincelli, 2016; Liu & Horsley, 2007; Sanders, 2011; Sanders & Canel, 2013; Waters & Williams, 2011). These perspectives take the view that the goals of government communication with the public are for actions associated with creation of a good image and reputation with the public, as well as for “relationship building” with the public (Ledingham, 2011; Sanders & Canel, 2013). Studies from these disciplines do not seem to explore the language of how this strategic and reputation-oriented forms of government communication take place. However, we observe in the larger literature of government communication the constant tension between agency-centered perspectives taken to improve the agency’s image and reputation, and the view of these functions as propagandistic. These views also contrast with the broader and more objectively positive functions of government communication, such as when crisis communication is well-performed and when government agencies are fairly and properly responsive to their citizens.

Other views associated with policy-oriented perspectives, science communication and information provision, consider the role of “public information campaigns” (DePaula, 2020; Graber, 2003; Lee et al., 2018; Lee & VanDyke, 2015). We may conceive of these as educational or instructional efforts to improve a type of social behavior, and therefore as a communication goal that is potentially more citizen-centered. It is true that public information campaigns could be in the interest of the agency (e.g. for control, ideology, or to improve an organization’s image). Weiss and Tschirhart (1994) suggest that such public information campaigns “pose significant threats to democratic values” (p. 84), since they provide power to government
agencies to attempt and potentially manipulate citizen knowledge and behavior. However, they also suggest that they create opportunities to strengthen democracy by achieving policy objectives that are broadly beneficial to the public.

In another major work within public administration that discusses the purposes and functions of government communication, but with a more specific focus on linguistic and discursive actions, Hood (2011) explores the concept of “blame avoidance.” Hood (2011) describes how intentions of office-holders for self-preservation; to claim credit for positive action; and to counter-act the negativity bias of the media and of human psychology more broadly, government actors often communicate with the public to explicitly avoid blame for the problems that are publicized. Hansson (2015) developed a framework for analyses of the more complex discursive characteristics of blame-avoidance, which included types of argumentation (e.g. discrediting others; misrepresenting the opinion of others; appealing to compassion); types of framing (e.g. hero/villain narrative, etc.); and types of denying (e.g. act-denial, intention-denial). In all, blame avoidance seems to be a prevalent and important goal toward which government communication with the public is directed.

Another distinct but related set of considerations on government purposes of government communication come from e-government or digital government studies. E-government is primarily concerned with the adoption of information processing technologies in government agencies (Bonsón et al., 2012; Cronemberger & Gil-Garcia, 2019; Medaglia & Zheng, 2017; Oliveira & Welch, 2013). However, given the inherent relationship between information technologies and communication technologies, the discursive aspect of communication (e.g. the language, words, expressions, etc.) is more or less explicitly studied in the fields of e-government and public administration. Studies in these areas have conceived of the purposes of
government communication and interaction with citizens, specially via ICTs such as social media, as one to increase transparency (Bertot et al., 2012; Fairbanks et al., 2007; Meijer, 2013; Sandoval-Almazan et al., 2018; Vos & Westerhoudt, 2008; Zhang et al., 2017) and government accountability (Bekkers et al., 2013; Fairbanks et al., 2007; Guillamón et al., 2016; Song & Lee, 2016; Stamati et al., 2015; Vos & Westerhoudt, 2008).

Moreover, many studies that have examined government adoption and use of social media have focused on the use of these tools for “participation” and “collaboration” (Chun & Luna Reyes, 2012; Panagiotopoulos et al., 2014; Ranchordás, 2017; Sandoval-Almazan & Gil-Garcia, 2012; Unsworth & Townes, 2012). Various studies in this tradition have focused on three basic purposes of government social media communication: “one-way push” or “information provision”; “two-way” requests for citizen participation; and “networking” or “dialogical” forms of government communication and collaboration (DePaula, Dincelli, et al., 2018; Lappas et al., 2018; Meijer & Thaens, 2013; Mergel, 2013a, 2013b). These categories or purposes of communication have also been studied under public relations and communication studies (Lee, 2009; Liu & Horsley, 2007; Liu & Kim, 2011; Liu et al., 2010). These forms of interaction have been particularly studied in the context of social media because these platforms are social networking sites; they are sites where individuals may communicate to each other, share each other’s content and refer to each other. Moreover, work on social media have also examined the use of these platforms for “crisis communication” and “emergency management”, and have considered this as an important goal of government communication with the public (Denef et al., 2013; Gascó et al., 2017; Hagen et al., 2017; Wukich, 2015; Yuan & Gascó, 2018).
2.6 Language and Discourse Studies

Studies from a perspective focused more directly on linguistic and discourse analysis have taken up the issue of government communication with the public. Much of the work on discourse analysis and critical discourse analysis is centered on political communication (Reisigl, 2008; Wodak & Forchtner, 2017), a subset of which is focused on the communication of executive government officials and policy-related communication (Jacobs, 2011; Eriksson, 2011; Farrelly, 2014). However, many of these studies are focused on how governments communicate a particular topic or subject matter (e.g. democracy, climate change), and do not propose a broad set of purposes or functions of government communication in the context of government interaction with the public (cf. Mulderrig, 2011) and interaction with the public via social media. However, in this area Sten Hansson (2015a, 2015b, 2017, 2018) has given specific focus to theorization of government discourse.

Hansson has explored linguistics structures of blame-avoidance (Hansson, 2015a) and “calculated over-communication” (Hansson, 2015b) in the text and talk of government actors, ultimately, in his words, to “manipulate” communication and for “positive self-presentation”. In a more general overview of government communication, Hanson (2017) suggests a set of linguistic resources or strategies government actors use to achieve their goals, which are broadly either to use language to “hold on to power” or to “exert power”. For the first, government actors may use various discursive strategies, some for self-presentation (including naming and attributing, as in the establishment of “in-groups” and “out-groups”, or using intensifying/mitigating devices, such as hyperboles or vague expressions); and some for blame-avoidance (including argumentation, framing, denying, specific types of actor/action representation, or legitimation).
Some of these strategies (e.g. framing) are more closely related to the actual
discursive/speech action, whereas others (e.g. legitimation) are more related to some ultimate
goal or purpose of the communication (e.g. see Chilton, 2004). Moreover, some of the discursive
strategies are more explicit in the structure of the text itself, whereas others assume some
outcome of the communicative behavior. For example, it is usually easier to detect whether or
not the subject matter in a piece of text is emphasized in a positive or negative frame. It is much
more difficult to know whether or not a piece of text effectively legitimates something or not,
although it may intend to. However, if this is the case, we need to examine both the language
and the intention. Nevertheless, discourse analysts, naturally, have paid close attention to
linguistic structures of text in the government context and the purposes and functions that these
instances of communication may logically and empirically have for government actors. These
views are from a more critical perspective, highlighting an agency-centered view of government
communication but perhaps ignoring the benefits to citizens. Nevertheless, the review here
highlights both of these views, identifying the “civic good” (Sanders & Canel, 2013) and
democratic purposes that government communication bring.

2.7 Summary and Synthesis

The distinction between the more positive outcomes and the more problematic issues of
government communication with the public have long been discussed in the government and
political literature (Edelman, 1971; Graber, 2003; Herman & Chomsky, 1988; Laswell et al.
1969; Yudof, 1979). For analyses of the discourse of government communication on Twitter, and
potential other social media sites, I provide a list of the purposes of government communication
identified in this review in Tables 1 and 2 below. Table 1 focuses on those communication
activities considered more agency-centered whereas Table 2 focuses on the actions that are more
citizen-centered (cf. Sanders & Canel, 2013). These distinctions are to be used cautiously and here serve only as a suggestive characterization for understanding their differences, as this classification considers the agents or entities toward which the communication is to more directly benefit. However, distinct messages may have distinct purposes and multiple purposes at once, to differing degrees. The analyses presented in the Methodology and Results chapter of this study consider some of this.

Table 1

<table>
<thead>
<tr>
<th>Purpose or goal</th>
<th>Source of discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blame-avoidance</td>
<td>Hansson, 2015a; Hansson, 2018; Hood, 2011</td>
</tr>
<tr>
<td>Counter-act media</td>
<td>Entman, 2009; Hood, 2011; Liu et al., 2012</td>
</tr>
<tr>
<td>Hold-on to/exert power</td>
<td>Entman, 2009; Hansson, 2017</td>
</tr>
<tr>
<td>Impression management</td>
<td>Benthaus et al., 2016; DePaula, Dincelli et al., 2018; Dincelli et al., 2016; Liu &amp; Horsley, 2007; Macnamara &amp; Zerfass, 2012; Waters &amp; Williams, 2011</td>
</tr>
<tr>
<td>Manipulation</td>
<td>Franklin, 2004; Hansson, 2017</td>
</tr>
<tr>
<td>Media management</td>
<td>Entman, 2009; Esser, 2013; Herman &amp; Chomsky, 1988; Thorbjørnsrud, 2015</td>
</tr>
<tr>
<td>Networking (Internal)</td>
<td>Mergel, 2013b; Vos &amp; Westerhoudt, 2008; Wukich &amp; Mergel, 2016</td>
</tr>
<tr>
<td>Policy promotion</td>
<td>Hood, 1986; Graber, 2003; Liu &amp; Horsley, 2007</td>
</tr>
<tr>
<td>Political arousal/quiescence</td>
<td>Edelman, 1971; 1976</td>
</tr>
<tr>
<td>Positive self-presentation</td>
<td>Hansson, 2015a; Hansson, 2017; DePaula, Dincelli et al., 2018; Vos &amp; Westerhoudt, 2008</td>
</tr>
<tr>
<td>Propaganda/Spin</td>
<td>Andrews, 2006; Gelders &amp; Ihlen, 2010; Herman &amp; Chomsky, 1988; Hood, 1983; Lasswell et al., 1969; McNair, 2004</td>
</tr>
<tr>
<td>Reputation management</td>
<td>Gascó et al. 2017; Hood, 2011; Sanders &amp; Canel, 2013</td>
</tr>
<tr>
<td>Relationship building</td>
<td>Ledingham, 2011; Sanders &amp; Canel, 2013</td>
</tr>
<tr>
<td>Self-preservation</td>
<td>Hood, 2011</td>
</tr>
<tr>
<td>Trust/Loyalty (increase)</td>
<td>Ledingham, 2011; Sanders &amp; Canel, 2013; Strömbäck &amp; Kiousis, 2011; Vos &amp; Westerhoudt, 2008</td>
</tr>
</tbody>
</table>
### Table 2

**Purposes and Goals of Government Communication with the Public: Citizen-centered**

<table>
<thead>
<tr>
<th>Purpose or goal</th>
<th>Source of discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountability</td>
<td>Fairbanks et al., 2007; Vos &amp; Westerhoudt, 2008</td>
</tr>
<tr>
<td>Civic good</td>
<td>Sanders 2011; Sanders &amp; Canel, 2013</td>
</tr>
<tr>
<td>Crisis communication</td>
<td>Graham et al., 2015; Hagen et al., 2017; Kavanaugh et al., 2012; Wukich, 2015; Yuan &amp; Gascó, 2018</td>
</tr>
<tr>
<td>Dialogue/participation</td>
<td>Bonsón et al., 2015; DePaula, Dincelli et al., 2018; Hood, 1983; Howlett, 2009; Mergel &amp; Nabatchi, 2010</td>
</tr>
<tr>
<td>Information campaign</td>
<td>Graber, 2003; Henry &amp; Gordon, 2003; Schwartz, 2017; Weiss &amp; Tschirhart, 1994</td>
</tr>
<tr>
<td>Information provision</td>
<td>DePaula, Dincelli et al., 2018; Graber, 2003; Medaglia &amp; Zheng, 2017; Mergel, 2013; Tursunbayeva et al., 2017</td>
</tr>
<tr>
<td>Moral suasion/exhortation</td>
<td>Hood, 1983; Howlett 2009</td>
</tr>
<tr>
<td>Networking (external)</td>
<td>Criado et al., 2013; DePaula, Dincelli et al., 2018; Hood, 1983; Mergel, 2013; Panagiotopoulos et al., 2014; Warren et al., 2014</td>
</tr>
<tr>
<td>News/Notification</td>
<td>Hood, 1983; Howlett, 2009</td>
</tr>
<tr>
<td>Relationship building</td>
<td>Ledingham, 2011; Sanders &amp; Canel, 2013</td>
</tr>
<tr>
<td>Transparency</td>
<td>Bertot et al., 2010; Fairbanks et al., 2007; Meijer &amp; Townevlied, 2016; Mergel, 2013b; Oliveira &amp; Welch, 2013; Unsworth &amp; Townes, 2012; Vos &amp; Westerhoudt, 2008</td>
</tr>
</tbody>
</table>
3. A Framework for Analysis of Government Discourse on Social Media

As previously discussed, language and rhetoric have been part of the study of modern government communication at least since the early studies of Lasswell et al. on the language of power. Moreover, in the second half of the 20th century, linguists developed the study of “discourse”—language in social practice—and concepts of “functional linguistics” which provide a basis for the study of lexico-grammatic structures of text and talk and their functions in specific social contexts (Fairclough, 2003; Halliday & Matthiessen, 2004). Many discourse analysts have focused attention on political discourse, as previously mentioned. Moreover, many of these studies have focused attention on the communication of government actors—officials and officeholders of executive government. However, there seems to be no studies exploring the characteristics of the discourse of government agencies on social media platforms such as Facebook and Twitter, although this has become a largely prevalent and potentially important activity for government agencies and societies around the world.

In this chapter, I describe a framework for discourse analysis of government social media communication, to analyze government social media posts or “messages”. The intention is to enable a fundamental and generic analysis of the content in terms of basic and explicit functions and relevant features of discourse. This framework is largely informed by theories and methods of text and discourse analysis from Searle (1969, 1976); Fairclough (2003); Halliday and Matthiessen (2004); van Dijk (2014); and Martin and White (2005), among many others who are cited throughout this Chapter. The framework constructed here is intended to capture basic and explicit lexico-grammatic characteristics of discourse—which I sometimes refer to as discourse components or elements, and more precisely as discursive functions and features—which can reveal distinct type of speech acts as well as other relevant features of speech and text in the
context of government communication. The analysis of this study is based on an analysis of the basic “meanings” (Fairclough, 2003) of language as they may be found in any social context. However, in this Chapter I also discuss how these discursive components may play a role more specifically in the government context.

The framework of analysis employed here corresponds to the three basic meanings for understanding language in any social context based on what is known as systemic functional linguistics (Fairclough, 2003; Halliday & Matthiessen, 2004). This framework sees all discourse as composed of a mixture of three dimensions: action, representation and identification, in the terminology of Fairclough (2003). The first, action, concerns speech acts, speech actions or speech functions (terms I use interchangeably) which identify the performative nature of utterances, clauses or messages and their functions in a social interaction. Speech acts have been studied in a variety of contexts (e.g. Carretero et al., 2015; Hashim, 2015; Nodoushan, 2014; Searle, 1985), however, a few main models have persisted in the literature. For this framework, I propose what may be considered to be traditional speech acts which have been used in literature of other social media contexts (Ilyas & Khushi, 2012; Vosoughi & Roy, 2016), and which may correspond to distinct government related functions. I should also mention that these were partially adjusted during the study to reflect insights that arose during the study. As summarized in Table 3 below, the specific speech acts adopted here are thus: directives; question prompts; participatory requests; commissives; expressives; declaratives; and representatives.

The second component of the framework concerns the represented content of the messages. Representations of the world are most directly associated with (or considered subcategories of) the representative speech act. These types of statements, also referred to as assertives, describe or explains things, events or processes in the world (Searle, 1969), and as
such are mostly closely related to the concept of *information* (Halliday & Matthiessen, 2004). Statements such as “I am sad”, “X is equal to Y”; or “smoking causes cancer” are conceived as representatives in this framework. Any a discursive *clause*—where the clause is the basic unit of meaning in functional linguistics—may be characterized by a limited, although large, number of more specific “semantic structures”, such as “topics”, “modality”, “precision”, “generality” and other forms of textual representation (Halliday & Matthiessen, 2004; van Dijk, 2014). Given the limited scope of this study, I focus on four forms of information representation, which may be useful in the government communication context, and also relevant for the particular agency studied. These are: *actor, topic, statistical* and *causal/scientific information*. The rationale and explanation for capturing these forms of representation are further discussed in this Chapter.

The third and final component of the framework concerns what Fairclough (2003) refers to as *identification*, or what I refer to as *evaluation*, in human discourse. This dimension of meaning concerns the attitudes, appraisals, judgements, sentiments and/or evaluations present in human discourse. There are various lexico-grammatic structures of language that reveal or help reveal this language of evaluation (e.g. words of agreement, feelings, morals, values, etc.), some of which are more explicit or implicit (Martin & White, 2005). This dimension is useful for distinguishing psychological valence from clauses or utterances (i.e. positive or negative content) as well as direction, intensity and other sentiments of psychological valence. Given the limited scope of this study, I focus on two broad discursive features in this dimension: *positive and negative content*; and *positive/negative self-evaluation*. The rationale and explanation for capturing these forms of representation are discussed below.
Table 3

General Discursive Functions and Discursive Features of Text

<table>
<thead>
<tr>
<th>Broad discourse meaning</th>
<th>Discursive function</th>
<th>Potential features of text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speech Act</td>
<td>Request</td>
<td>Interrogative statement asking for something.</td>
</tr>
<tr>
<td></td>
<td>Directive</td>
<td>Verb used in imperative form.</td>
</tr>
<tr>
<td></td>
<td>Commissive</td>
<td>Explicit reference to promises, pledges, etc.</td>
</tr>
<tr>
<td></td>
<td>Expressive</td>
<td>Reference to emotions, values, evaluations.</td>
</tr>
<tr>
<td></td>
<td>Declarative</td>
<td>Official proclamation or declaration.</td>
</tr>
<tr>
<td></td>
<td>Representatives</td>
<td>Statement about something, description or explanation of phenomenon.</td>
</tr>
<tr>
<td>Representation</td>
<td>Information</td>
<td>Use of proper or common nouns.</td>
</tr>
<tr>
<td></td>
<td>Representation</td>
<td>Distinct levels of generality/abstraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Causal relationships.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reference to source of information.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Levels of precision in detail.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Certainty/likelihood in expression.</td>
</tr>
<tr>
<td>Identification</td>
<td>Evaluation/Appraisal</td>
<td>Positive or negative terms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reference to morals and values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reference to preference or agreement.</td>
</tr>
</tbody>
</table>

Before further discussion I should make a note on terminology. I often refer to the “discourse categories”, or the “major types of meaning”, of the framework as the “discourse characteristics”, and more precisely, the discursive functions and features, or the functions and features of text. I refer to them as functions because at the dimension of speech functions, each category of statement has its own distinct role: each category here is a unique type of social action within the communicative behavior (e.g. requests, commitments, directives are distinct). However, regarding forms of representation (which may be considered as more specific forms of the representative speech act) the categories are considered as features, since they are explicit about a “function” (e.g. representation of actors, topics, statistics, etc.). Similarly, regarding forms of evaluation (which may be conceived as forms of the expressive speech act), the more
specific categories within it I call *features* (e.g. positive, negative) since they are not functions in and of themselves but features or components of the discourse.

### 3.1 A Brief Discussion on Genre of Discourse

One of the motivations for this study comes from the idea that the discourse of government social media messages may have a set of characteristics that makes it a unique *genre of discourse*. Genres of literature, rhetoric and discourse have been long discussed in the fields of communication, literature and linguistics (Hyland, 2002; Martin & Christie, 2000; Miller, 1984). Genres are conceived differently depending on the author and tradition, but they generally highlight the relationships between text and context and help explain the nature of discourse within particular “situations” (Miller 1984; Hyland, 2002). In the framework of systematic functional linguistics, genres are partially defined by the purposes and goals of contexts and situations and therefore are conceived as part of broader social processes.

Fairclough (2003) suggests, very broadly, that genre refers to a generic structure, style, form or mode of acting and/or communicating (Fairclough, 2003). This simplistic view of genre as “any category or kind of discourse” has long been criticized as likely overly reductionist and formalist while not producing useful categories or classification schemes (Miller, 1984, p. 151).

As Miller (1984) argued, in the context of rhetorical studies, genre is a useful category not because it establishes a taxonomy, but because it emphasizes social and historical aspects surrounding the text and reflects certain actions that lead to and are consequential from the text. Nevertheless, within the SLF approach of describing and interpreting discourse via meanings and functions of *action, representation* and *identification*, establish categories useful to reveal a particular genre within certain situations and contexts.
Given this notion of genre as a particular association between text and context, we may conceive of government communication on social media as a particular \textit{genre of discourse}, associated with the use of certain types of functions and features of discourse, as they will be examined in this study, as well as the context of the goals of government agencies, as has been reviewed in Chapter 2. The framework adopted here thus provides a comprehensive foundation for analyses of various details of language that help characterize the discourse and relate it to its political, bureaucratic and media contexts. While in this study I do not compare government discourse on social media with government discourse in other media or situations, I expect the framework and analyses adopted here to provide a window to the principles, or an initial outline, of the genre of government discourse on Twitter and potentially social media more broadly.

\subsection*{3.2 Speech Acts}

Speech acts refer to the main types of meanings or functions pursuit or sought in discourse. Any a clause in discourse may be said to refer to a distinct speech act. Speech acts have been studied at least since the work of Austin (1962) which differentiated the representative nature of speech—the use of language to represent the world—from its performative or “illocutionary” force—the use of language to do things, rather than simply represent things (Searle, 1969, 1976). Speech acts have been specially considered in the context of dialogue and conversation analyses (Traum, 2000; Hardy et al., 2004; Strzalkowski et al., 2010), and are a main topic of discussion in studies of \textit{pragmatics}, the branch of linguistics that deals with language in use in social-cultural context (Verschueren, 1998; Kecskes, 2010). Given that social media is a platform for social interaction or “two-way” communication, analyses of speech acts as such may be particularly interesting in the context of social media (Ilyas & Khushi, 2012; Vosoughi & Roy, 2016; Zhang et al., 2017).
Table 4

Definition and Potential Functions of Speech Acts in the Government Context

<table>
<thead>
<tr>
<th>Speech Act</th>
<th>Explanations for identification and potential functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directive</td>
<td>An order or command to carry out an action. Grammatic form entails a verb in the imperative form in the beginning of the sentence. May be seen as explicit attempts of governments to have citizens change their behavior or act in a particular way.</td>
</tr>
<tr>
<td>Question prompt</td>
<td>A question prompt is a question to draw attention from a user and/or to identify specific stakeholders for whom the messages may be directed. May be seen as attempts to attract citizens to their message or emphasize a point.</td>
</tr>
<tr>
<td>Participatory request</td>
<td>A request, invitation or question to citizen that provides a means (including direction, link or information) for contacting or interacting with the government. May be seen as efforts for citizen participation in government.</td>
</tr>
<tr>
<td>Commissive</td>
<td>Reference to commitment, pledge, or promise being made. May also refer to promises or commitments previously made and now kept. May be used to hold government actors accountable for their “promises”.</td>
</tr>
<tr>
<td>Expressive</td>
<td>References to sentiments or phatic expression of “congratulations”, “Happy Holidays”, “Thanks”, “Condolences”, related to anniversaries, celebrations, death or other similar events and norms. May be seen as reflection of what government actors value, prefer and/or appreciate.</td>
</tr>
<tr>
<td>Declarative</td>
<td>Statements that declare an action. The utterance itself creates the action that it is supposed to bring about. Not to be confused with announcements of previously declared decisions. References to official government statements.</td>
</tr>
<tr>
<td>Representative</td>
<td>Description or representation of fact, person, thing, process or situation. All speech acts are considered to represent something. But these are references to information about the government or the external world. In this taxonomy, a representative is a clause that was not first classified as any other speech act.</td>
</tr>
</tbody>
</table>

Searle (1969) built on Austin’s work and proposed a speech act taxonomy of five categories: assertives (or representatives); directives; commissives; expressives; and declaratives. Fairclough (2003) has noted the importance of “Questions” as a distinct speech act, and other frameworks have proposed their own taxonomy (Dore, 1975; Nodoushan, 2014; Zhang et al., 2017). Indeed, the literature on speech acts is large (e.g. Vanderveken & Kubo, 2002) and growing, specially concerning social media speech acts (Ilyas & Khushi, 2012; Vosoughi & Roy,
For the context of this study, I propose seven speech acts which may be useful for making sense of government discourse on social media and social media discourse as a genre of communication. These include the five speech acts of Searle (1976), and two additional categories: one of participatory requests and one of question prompts. These speech acts are summarized in Table 4 and are further discussed below.

3.2.1 Directives

One of the categories of speech acts is the directive (Searle, 1969; Verschueren, 1998). Directives are similar to requests since they are attempts by the speaker to get the hearer to do something. Searle (1976) writes that these “may be very modest ‘attempts’ as when I invite you to do it or suggest that you do it, or they may be very fierce attempts as when I insist that you do it” (p. 11). In the framework of Fairclough, directives and requests are considered a type of demand or request, similar to the framework of Dore (1975). As with other speech acts, directives may be difficult to reliably observe given the various ways of rendering an attempt to suggest someone to do something. However, on social media messages, directives may be more reliably observed as explicit directives, when the verb is conjugated in an imperative form, such as “do not drink the water from the flood” or “check the radon levels of your home” (e.g. Halliday & Matthiessen, 2004). Directives may thus be observed in text messages and discourse at least in the case of explicit commands for an action (though, of course, whether or not a citizen or user follows that directive is another matter).

Directives may be interesting and valuable to observe in the context of government social media use because they may reflect explicit attempts by government agencies to influence citizen behavior, direct citizens for certain actions to certain information. Moreover, they may relate to various purposes of government communication, such as public information campaigns and/or
crisis communication. As previously discussed, information campaigns constitute an important component of government communication with the public (Syme et al., 2000; Klingemann & Römmle, 2001; Finseraas et al., 2017). While critics may point to problems in these activities of large social control (or attempted control) (Williams, 2019), many have noted these as a potentially beneficial policy instruments (Henry & Gordon, 2003; Weiss & Tschirhart, 1994; Schwarz et al., 2007). I do not suggest that directives are the only discursive components of information campaigns or public service announcements. Such activities may make use of various forms of discourse (Shoemaker, 1989). However, directives may be considered as explicit attempts by the government to have citizens change their behavior or act in a particular way, and thus may be references to goals of government that benefit the governments agencies and/or the citizens.

3.2.2 Requests and Question Prompts

In the taxonomy of Searle (1976) and of Fairclough (2003), “requests” in discourse are associated with “demands” or “directives”. Moreover, within Fairclough’s framework, requests or demands are associated with activity exchanges—communicative exchanges between people based on gaining or doing something—whereas questions and statements are associated with knowledge exchanges—communicative exchanges between people based on learning or knowing something. The distinction follows Habermas’ view of human communication as strategic or communicative action (Habermas, 1984). However, we may also think of requests as a type of question, or a speech act in which there is both activity and knowledge exchanges. Moreover, in the context of government posts on social media, requests may have the quality of participatory requests, such as government questions for citizens to obtain citizen feedback, or to call citizens to interact with the government in some fashion. A previously discussed, a number of studies
have highlighted the communicative purposes of government as asking citizens to collaborate or participate in some “two-way” activity with the government, in attempts to improve government/citizen relations (DePaula, Dincelli et al., 2018; Guillamón et al., 2016; Harrison et al., 2012; Mergel & Nabatchi, 2010). In this sense, requests as questions to citizens for input or feedback may be associated with the democratic purposes of government for interaction with citizens.

Lexico-grammatically, requests may come in the form of assertions (e.g. “We request that you attend”) but, especially in the government communication context, also in the form of questions, such as “Could you provide your opinion on this issue? Or “Would you join us in this event?”. Given that the interrogative form is the more polite and formal way to make requests, requests may be more often characterized as such in the messages of government agencies. However, not all questions may be actual requests, participatory or otherwise. Given initial work on this topic, it came to my attention that some questions may be more akin to rhetorical questions or question prompts, where the question may have or incite an answer, but there is no expectation for an explicit answer to be provided by the user.

The dictionary definition of a rhetorical question is: “any question asked for a purpose other than to obtain the information the question asks” (Burton, 2007). Although some of the questions used in government social media messages may be classified as such, it seems that these are more like “question prompts”: questions used to obtain attention from the citizens and/or to identify specific stakeholders for whom the messages best apply. For purposes of this study, I thus consider the questions that do not ask the user or the public for an answer or comment, or provide a means or direction for the user to provide an answer, as a question prompt. For example: “Did you know that we have recycling programs?” or “Did you bike to
work today?” may be considered questions prompts, as they seem to be used to identify individuals that may be interested in the content of the messages, although the questions do not actually require that the user explicitly provides an answer. Therefore, I distinguish between two types of questions: question prompts, which do not provide a mechanism for the public to respond; and participatory requests, which do provide such information or mechanisms for answers or interaction from the public.

3.2.3 Commissives

Commissives are a particular type of speech act in the framework of Austin (1962) and was similarly adopted by Searle (1976). Commissives are considered a distinct social action because they place the speaker in a position of indebtedness to the condition or statement proposed, which is not necessarily the case with any other speech act. Searle suggests that verbs such as “shall”, “intend”, or “favor” are not (or should not) be considered commissives, as Austin (1962) had, which I infer to be the case because the acting of committing or promising is relatively stronger than the acting of indicating one’s intention or one’s favorability to do something. Indicating that someone intends to do something may demonstrate an attitude or evaluation toward that something, but it is distinct from promising or pledging to carry out that something. Commissives may be what Fairclough (2003) has in mind when discussing “offers” as a speech act. Commissives are strongly associated with, or defined as, promises, vows or pledges. As such, commissives or commitments are often discussed in the political communication literature (e.g. Goodliffe & Hawkins, 2006; Krebs & Jackson, 2007) and have been addressed to some extent in the government communication literature (Chou et al., 2008; Canel & Sanders, 2012; Graham, 2014).
Commitments and promises in the government communication context may be associated with the policies or actions that politicians and officeholders vow to support. Moreover, analysis of these speech acts may enable citizens to hold politicians and government officials accountable for what they have indeed promised or pledged to do. In the generic government social media discourse we may observe explicit references to commitments or promises that are made to the public, in the usage of terms such as: “We are committed to” or “Our organization promises to”. Moreover, we may also consider that statements about the future, when the actor indicates a future outcome of its actions (e.g. “my plan will deliver improved results”), are types of commissives.

3.2.4 Expressives

*Expressives* are speech acts which express some psychological state of the speaker, although not necessarily with an explicit assertion about it. They are often idiomatic phrases such as “congratulations”, “Thanks!”, or “happy birthday”. Searle (1976) explains that: “In performing an expressive, the speaker is neither trying to get the world to match the words nor the words to match the world” (p. 12). That is to say, these statements are not intended to have the speaker or hearer do something, and are not, a representative assertion about a state of the world (e.g. an assertion about a fact, thing or process). However, expressives have the quality that they do reflect or represent a particular sentiment polarity or psychological valence of the speaker or the hearer, though, as Searle further notes, the sincerity of the speech is presupposed. As defined, expressives are associated with the language of evaluation, sentiment and the expression of attitudes (Fairclough, 2003; Martin & White, 2005). Although some of these expressions are often defined as “phatic expressions” or “small talk” without informative or
actionable importance, they may also perform a “grooming” or “symbolic” function in the social interaction, with certain effects (Makice, 2009; Radovanovic & Ragnedda, 2012).

Dunbar (1998) famously argued that the seemingly meaningless utterances that humans exchange with each other, including “gossip” and small talk, are part of a linguistic evolution of older forms of “grooming” between primates and are used to establish social bonds. Donath (2007), early in the development of social media, discussed the use of these linguistic forms as the social signals that help establish relationships among individuals on large social network sites. These forms of communication are interesting to note in the context of government because they may also serve these “grooming” functions between government agencies and citizens. In addition to these types of expressions, and explicit representations of sentiment, expressives may refer to references to moral sentiments. For example, in this study the statement: “We are honored with this award” is defined as an expressive since it represents a type of sentiment—honour as a moral sentiment—held by someone/something (cf. Martin & White, 2005).

Previous research has identified these types of interaction as part of the “networking” that governments are engaging with their citizens on these platforms (Kavanaugh et al., 2012; Mergel, 2013b; Sandoval-Almazan et al., 2018). Colleagues and I have noted the presence of these speech acts in the context of local government communication on Facebook (DePaula, Dincelli, et al., 2018; DePaula & Dincelli, 2018). We referred to these as “symbolic acts” since we did not find them to reflect, in themselves, collaborative or participatory efforts between governments and citizens to address political or policy issues, as others seem to have suggested they could or should (e.g. Bertot et al., 2010; Mergel, 2013a). However, these expressives or symbolic acts seemed like attempts to show emotions toward others and/or were used to signal moral and ethical values (e.g. honor, pride, etc.). Expressives may fulfill government
communicative purposes of interacting and dialoguing with citizens but also may more simply be ways to provide positive presentation of the agencies and their actors.

3.2.5 Declaratives

The category of declaratives was proposed by Searle (1976) as a specific type of speech act to complement his first taxonomy (Searle, 1969) and also to build on the work of Austin (1962). Declarations are distinct from other types of speech acts, according to Searle, in that “the successful performance” of the speech act “brings about the correspondence between the propositional content in reality” (Searle, 1976; p. 13). That is to say, whereas other forms of speech acts, such as basic assertions about the quality of the world, have a direction of fit that is “world-to-words”, declarations are “words-to-world”; the utterance itself creates the condition or state of affairs that it is supposed to bring about. Examples of declarations are: “I hereby declare”, “You are now fired”, “I pronounce you husband and wife”.

As Searle (1976) notes, these acts assume an “extra-linguistic institution” (p. 14) which renders the declaration official. As such, it is reasonable to expect that government communication may make use of these specific linguistic resources, since it provides that “extra-linguistic institution” at it is a domain in which official, policy or legal declarations may be performed (Canel & Sanders, 2012; Edelman, 1971; Graber, 2003; Yudof, 1979). Government agencies may certainly reproduce or disseminate information that is originated elsewhere, first communicated to the public via other media (Bertot et al., 2010). Although previous studies do not seem to have examined the use of social media as outlet for government policy declarations, at least in the English-speaking world, the use of social media as the first media through which policy declarations are communicated to the public has come under attention given the use of Twitter for these purposes at least by U.S. President Trump (Salama, 2017; Jeong, 2018;
Thompson, 2019). As such, in terms of government goals, these declarative statements may also be considered “news”, “notifications” or a type of “information provision”.

### 3.2.6 Representatives

The last speech act discussed here are representatives, which have also been referred to as assertives (Searle, 1969) or simply statements (Fairclough, 2003). Representatives are statements or clauses about some quality of the world. These statements may be assessed as true or false in the correspondence between the semantic content or proposition of the speech and the actual or objective reality to which it refers (Searle, 1976). Representatives may be rendered in the past, present or future tense. For example, statements such as “John is nice”, “It is raining”, “I will go shopping tomorrow” fall in this category of speech acts. As Searle (1976) writes, the simplest test to identify this speech act is whether or not it can logically be assessed for its truth or false value.

Representatives may be considered the default definition of any a clause, utterance or speech, since all use of language is symbolic and may be considered “representative” (Burke, 1968). However, as a distinct category of speech acts, in the government context and otherwise, representatives or assertions are more explicitly statements about a thing, process or condition in the world. In the context of government communication, it is likely in representatives where we may find something like “information provision” as it is discussed in the government communication and government social media literature (e.g. statements about facts and conditions in the world) (Bertot et al., 2010; Harrison et al., 2012; Mergel, 2013b; Guillamón et al., 2016). Distinguishing representatives from other types of speech acts may thus also facilitate the understanding and differentiation between explicit descriptions of the world from other types
of discourse and language expression, and differentiate between more reliable information from more dubious, vague, or explicitly false content.

As with other speech acts, representatives make assumptions about the psychological state of the speaker. Searle (1976) suggests that the psychological state expressed in assertions is a belief that the proposition of the utterance is true. In the context of government social media posts, it may be difficult to assume the belief of the government actor regarding the proposition communicated. However, it should be noted that such speech acts may loosely commit the speaker to the statement that she is making. If one says something that can be determined to be false to another, this may create complications for the social interaction (assuming, of course, no sarcasm intended and understood). Moreover, we may also note that representatives in the future can never be fully assessed as true or false in the present, and may also be conceived as commitments or promises, or policy declarations, especially in the government context (e.g. “We will address the potholes in the city”; “We now declare the agency will no longer buy plastic bags”, etc.). As such, for an empirical analysis and classification of messages according to these categories of speech acts, practical considerations about human coding or annotation will need to be made. For this study these are discussed in Chapter 6.

3.3 Information Representation

Representation is explained in different ways in the frameworks of Fairclough (2003) and Halliday & Matthiessen (2014). In this study, representation is considered the default speech act, and the component of text meaning associated with discussions of information and knowledge—rather than social interaction per se (Fairclough, 2003; van Dijk, 2014). One of the more comprehensive reviews of the semantic structures of information representation has been provided by van Dijk (2014). Discussed in the context of discourse and knowledge, van Dijk
(2014) provides an extensive list of the “semantic structures” and “epistemic structures” of text and talk that may be used to analyze the various forms and qualities of information representation. These are essentially the ways that things, events and processes in the world may be presented or described via text, in longer documents or potentially in short-text messages.

According to van Dijk (2014) a few of these semantic structures include: *level of description, degree of detail, precision, certainty (of the speaker), topic and focus, metaphor, evidentials* and others (p. 304-305). It is beyond the scope of this work to assess all of these discourse structures empirically. However, for this study I propose to examine four categories or forms of information representation in the context of government communication: *actor of/in message, topic, statistical information and causal/scientific information*. Although these are limited categories of information representation, and cannot be used to assess more complex issues of rhetoric (e.g. the use of metaphors, the quality of argumentation, references to dialogue), these discursive features are chosen because they identify essential elements of the semantics of the content which can then be used to assess what the government social media messages are talking about, who they are talking about, as well as their use of more complex, verifiable and potentially difficult to obtain information, such as *scientific and causal information* and *statistical information*. The reasons for choosing these four are thus that they are fundamental features of discourse, as they identify the subjects/objects of a message; they are relatively easy to observe objectively; and they enable us to examine relevant features in government communication, such as the provision of complex and verifiable information. These types of information representation are summarized in Table 3.3 below.
### Table 5

**Structures and Features of Information Representation**

<table>
<thead>
<tr>
<th>Information Features</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actor</strong></td>
<td>Actors are here broadly defined as an individual, an organization or a specific program referenced in the message. Actors may be considered the “subject” of a message, as an agent or as an object in a clause.</td>
</tr>
<tr>
<td><strong>Topics</strong></td>
<td>Topics or themes summarize what a message or document is about. It refers to the domain, issues or phenomena represented in a message. A topic may be considered the “subject” of a sentence in a grammatical sense.</td>
</tr>
<tr>
<td><strong>Statistics</strong></td>
<td>In this study, statistics refer to any value that is more complex than a basic count, such as percentages, averages, ratios, etc., which may be in reference to a sample or population of instances.</td>
</tr>
<tr>
<td><strong>Scientific and causal information</strong></td>
<td>Scientific and causal information are here conceptualized as references to general causal information that may originate from scientific work, or direct references to scientific work, such as a novel study or a detailed report.</td>
</tr>
</tbody>
</table>

### 3.3.1 Actors

One of the important components of language is the *subject* of a message or clause, which may refer to the *agent* of the message, or to the *theme* of the message (Halliday & Matthiessen, 2004). In the clauses “Trump is the president” and “We have done what we can”, “Trump” and “We” are the subjects of the sentences, in traditional grammar, but also may be considered social actors or agents. In the sentences “It is snowing” or “To live is to love”, the grammatical subjects are not actors; in this case the subject of the clause or message may be conceived as the theme or topic (Comrie, 1989; Halliday & Matthiessen, 2004). In this framework, we may thus distinguish the *actor* of the messages being portrayed in the discourse from the *topic* or theme, which I discuss later. In government communication with the public, it may be important to understand *who* the government is talking about, who carries out the actions, and who are implicated in the state of affairs being represented in the content, whether
they are individuals, organizations or government programs, and as such capturing *actors* in the content may be useful.

Since social media platforms are sites for self-presentation and self-promotion, including for government agencies (DePaula & Dincelli, 2016; Medaglia & Zheng, 2017; DePaula, Dincelli, et al., 2018), to understand this self-presentation behavior it is important to capture actors or agents portrayed in the messages. Moreover, since social media are also sites of “networking” and connections, capturing the actors or agents present in messages may be useful to understand who the individuals, organizations or programs are that are being praised or derided by government agencies. This may be useful to understand the relationships among government actors as well programs supported by government agencies. However, since there are a large number of specific actors that may be referred to in the content, especially as we consider organizations and programs as potential actors, a certain degree of generalization may be useful for analysis. For this study, I thus propose to distinguish between three types of actors: *internal actor* (e.g. the agency itself, an employee of the agency); a *government actor* (e.g. another agency or another (current) government actor); or *external*, which are actors external to the agency (e.g. a citizen, a private firm, etc.). This approach is further discussed in chapter 6.

### 3.3.2 Topics

The *topic* or *theme* of a clause, message or larger piece of text may serve as a general indication of what the content *is about*. According to van Dijk (2014), topic is related to *focus*, and that is both a distinction and a relation. The *topic* may be conceived as a generic theme, “old” information or something already assumed; and *focus* refers to the salient and new piece of information, perhaps exemplifying the theme. However, the content of focus may imply the theme and vice-versa. For example, in a short text such as “Climate change is affecting forest
fires”, the theme may be climate change (old information, or the setting), and the focus is forest fires, the “new” information emphasized. Moreover, as has been discussed in studies of computational topic modeling, topics may be considered as *generic topics* (e.g. health, sports, news, politics), a *meso-level theme* (e.g. environmental safety, job creation) or a more *specific and recurrent issue* addressed in the content (e.g. “Proposition 8”, “Gulf oil spill”) (DiMaggio et al., 2013; Törnberg & Törnberg, 2016). Exactly how to determine what a topic of a sentence or message is thus depends on the scope of how one defines it.

Despite the complexities of identifying topics, topics may be important to capture for understanding what government agencies are talking about on their social media platforms (e.g. what policy issues, what types of domains discussed, etc.). The topics discussed by government agencies may indicate the issues that they deem important to communicate, or not to communicate, with the public about, and could be a main feature of variability in the government discourse over time and across political administrations. Moreover, capturing these topics may enable analysis of how the topics communicated by government agencies on social media relate to topics that are emphasized on other government channels and other media. This could thus reveal the issues that government agencies deem important during some period of time, and how this relates to the importance given to those issues on other media channels or in actual government policy.

In this study, to enable a more objective and reliable assessment of topics, *topics* will refer to a selection of “topic terms” that are present in the clauses or messages that are deemed to summarize what the content is about. Topic terms will thus generally be the common or proper nouns, sometimes accompanied by a verb or adjective, that identify the context or domain area which is being discussed in a message. For example, in the sentence “We are addressing the
problems of climate change”, “We” is the actor, and “climate change” is the topic (subject as topic or theme). Topics may thus appear as objects in the grammatical sense of the term, and certain messages may have multiple topics. For example, “climate change is increasing forest fires” may include the topic of “climate change” as well as the topic of “forest fires”. As such, topics is the only category in the framework of this study that actually capture instances of the specific terms represented in the messages as values for the discourse category. Further details of this conceptualization of topics are presented in Chapter 6 below.

3.3.3 Statistical and Scientific Information

In addition to who and what is being discussed, information may be represented in various forms, in more precise or vague terms, or with different levels of elaboration, explanation and evidentials (van Dijk, 2014). Moreover, as just discussed, messages may refer to distinct, and broad, domains of life, such as business, medicine, politics, etc., or to specific subject matter, such as a particular chemical or policy initiative. As previously indicated, it is beyond the scope of this study to examine all of these semantic structures of discourse or all possible domains of discourse, and certainly not all possible issues discussed. However, it may be particularly interesting and feasible to reliably capture the presence and extent of references to statistical information, as well as what I have tentatively referred to as causal and/or scientific information.

Technically, a statistic is a computation of value from a sample. However, more broadly, statistics, such as percentages or measures of likelihood, refer to information that is both precise and general, often difficult to obtain, and may be of greater value to society, given its higher complexity (e.g. compared to simpler counts or announcements of events). Although I do not propose that statistics are normatively better than other types of information, it may be valuable
to capture their presence and extent of use in this context to understand how and the extent to which government agencies communicate this more complex type of information to the public. Moreover, statistics assume some type of scientific or research activity behind them. Therefore, they may serve as a reference to more reliable information. Moreover, given their precision they may be more easily verifiable information. Government agencies are often tasked with undertaking research and scientific activities which produce this type of information, and therefore may often communicate this type of information. Statistical information may also be relatively easy to observe in the lexico-grammatic expression of messages, as explicit references to statistical terminology (e.g. percentages, likelihoods, measures of average, etc.) and may thus be objectively identified.

The term scientific and/or causal information is used here in a broad and tentative way to refer to information about causality or causal relationships in the world, as well as explicit references to scientific activity. Scientific/causal information are discussed together with statistics because I conceive of them as references to more complex types of information and references to more reliable and/or verifiable information. The practice of research and science is aimed at defining and measuring things in the world as well as discovering the more complex and difficult to capture effective or causal mechanisms that bring phenomena about (Bhaskar, 2008). Causal information is important in the government context because it may be part of the education of the public about health or environmental issues and may also be the result of internal reports and studies of a government agency, similarly to statistics. For example, government agencies may communicate to the public that “eating tuna more than once a week may lead to poisoning caused by the mercury in the fish”; a report may find that “years of negligence led the city to go bankrupt”. There are a range of terms used to express causal
information, such as “causes”, “leads to”, “due to”, “because of”, etc. In many cases, in political contexts, individuals and organizations may refer to causal phenomenon in an unprecise or unscientific way, such as in “your support is leading us to do better” or “because of the prime minister we have greatly improved”. In this study, I attempt to differentiate these two, and seek to examine how causal/scientific information that seems more reliable and verifiable appears in the messages. Further discussion of this is provided in Chapter 6.

3.4 Identification

The last dimension of meaning discussed in this study is what Fairclough (2003) terms identification, which relates to what Halliday and Matthiessen (2014) refer to as the interpersonal aspect of language, and which Martin and White (2005) refer to as the language of evaluation. This dimension of meaning recognizes how text is identified with text speakers or hearers (Fairclough, 2003). This realm of communication is associated with opinions, sentiment, appraisals, attitudes and/or evaluations (Martin & White, 2005). I have thought that the term evaluations provides a better reference to the focus of this study, which refers to positive and negative sentiment that may be triggered on the reader, as well as the positive or negative sentiment expressed toward an object in the text itself, which may be conceived as a type of attitude or appraisal of an object. Moreover, I think we can refer to positive and negative sentiment as a “frame”, “framing” or “tone” of the message as done in communication studies (Boydston et al., 2013; Morstatter et al., 2018).

Text sentiment, as may be observed in discourse, refers to the negative, neutral or positive sentiment, emotion, or psychological valence that a message or piece of text may produce in a human (Mohammad, 2016; Strzalkowski et al., 2014; Turney, 2002). Although general and measured analyses of sentiment in text have existed at least since the first analyses of
public opinion in the 1930s, sentiment analysis as a research program grew out of studies of computational text analysis and machine learning in the late 20th century, based on the proliferation of user-generated content on the Internet (Pang & Lee, 2008). Studies of sentiment analysis are sometimes problematic because the notions of sentiment, opinion, attitude, evaluation, subjectivity, and others are not properly distinguished (Mohammad, 2016; Taboada et al., 2011).

However, this study is intended to distinguish and capture two distinct forms of positive and negative content as they appear in text. The first refers to positive polarity and/or negative polarity that a human may feel from a message, which refers to any content that generates positive and/or negative sentiment on the reader. I refer to these as positive and negative content. I also propose to capture positive and/or negative self-evaluation, which may be more objectively considered as self-presentation. These are more explicit expressions of appraisal or attitude toward the government agency itself or its actions as well as connections between the agency and some positive and/or negative activity. The rationale for focusing on the evaluation of this object (i.e. the agency), and not others, is that there are various objects toward which sentiment or attitudes may be directed. However, on social media, self-evaluations may be particularly prevalent, since social media communication is recognized as communication about oneself (Castells, 2019; Cunningham, 2013). Analyzing these fundamental discursive features, in this precise way, may thus provide an initial and reliable view of how government agencies use the language of emotions and evaluation in their communication with the public.

3.4.1 Positive and Negative Content

Reliably capturing positive and negative content from text in the government social media context is interesting and valuable to understand the emotional content of government
messages. Moreover, this variable may correlate with other variables, such as citizen response measures or more specific purposes, such as emergency and crisis events (Hagen et al., 2018; Hofmann, Beverungen, et al., 2013; Roshan et al., 2016, 2016; Verma et al., 2011). Studies in the political communication literature have analyzed sentiment of politicians in political campaigns, especially in the context of (attempting to) predict elections (Tumasjan et al., 2010; Criado et al., 2012; Ceron et al., 2015; Ceron & d’Adda, 2016). Studies have also noted the “negativity bias” of traditional media regarding political and economic information (Soroka et al., 2017), as well as biases in the demand side of news consumers (Trussler & Soroka, 2014), which may be interesting to consider in the context of government communication and citizen expectations. Also, it has been found that negative information “weighs more heavily on the brain” (Ito et al., 1998), and therefore may be good to be avoided to a certain extent. Lastly, sentiment has been observed as a measure of neutrality in government messages (Hofmann, Beverungen, et al., 2013; Zavattaro et al., 2015), although, as I later argue, neutrality may be better assessed via the concept of self-evaluations.

In an analysis of sentiment from Facebook messages generated by local government agencies across the U.S., Zavattaro et al. (2015) examined how “tone” of the government text, measured via “sentiment analysis” dictionaries, impacted citizen/user engagement. They analyzed over 17,000 tweets across 125 official government Twitter feeds and found that the overall sentiment level was “in the neutral category” suggesting that this would be in line with a “push strategy” of “one-way” information sharing (p. 337). They also found that government posts with overall positive sentiment were associated with higher levels of citizen engagement, but not necessarily citizen sentiment. Sentiment analysis of government content, and in the government social media context, may thus be useful to understand and track other response
variables (e.g. citizen response, media response), to be reflective of the overall psychological valence of the media ecosystem (Soroka et al., 2017), and to more simply serve as a basic and likely important component of the overall genre of discourse.

3.4.2 Self-presentation

In studies of sentiment and evaluation in text, as previously indicated, how one evaluates or identifies with an actor, subject or object is important because it reflects values, preference, opinions, judgements, priorities and/or attitudes (Fairclough, 2003; van Dijk, 2014). Moreover, evaluations may be observed as specific lexico-grammatic characteristics of discourse (Martin & White, 2005). Sentiments are related to evaluations, in the sense that an evaluation may be conceived as a sentiment toward something (Mohammad, 2016). Although I do not take the position that government actors should not provide their opinions, or appraise content, it may be interesting and important to distinguish between opinions provided by the government from other types of statements such as more purely factual representative content.

There are many types of evaluations that could be observed in government discourse on social media, such as the use of types of metaphors, or other rhetorical devices of the language of evaluation (e.g. Martin & White, 2005). However, in an analysis of evaluative discourse on government social media, it may be valuable to examine how government messages express evaluations of themselves, what I refer to as self-presentation or self-evaluation. Self-presentation is an important concept in the analysis of social media discourse, since the media have been generally recognized as platforms for “self-presentation” (Walther, 2007; Bareket-Bojmel et al., 2016), and “image-repair” or “favorable presentation” in the organizational and government context (Gascó et al., 2017; DePaula, Dincelli, et al., 2018). In addition, this variable may provide a better understanding of neutrality in government discourse, which has been a
topic of interest in studies of democracy and ethical government practice (Blocher, 2011; Bertot et al., 2012; O’Leary, 2013).

A government agency may refer to much content that produces positive and/or negative sentiment, such as references to hunger, flooding, hurricanes, disasters, crimes, awards received or provided, popular legislation passed, etc. Identifying positive and negative terms does not indicate the opinion or positioning of the agency toward some measure or topic. Although others have discussed positive/negative valence as a matter of “neutrality” (Zavattaro et al., 2015), “viewpoint neutrality” is potentially more problematic in government (Blocher, 2011). It may also be noted that viewpoint neutrality is particularly important when there is a controversy or divisiveness about an issue. However, the mere presence of “potentially controversiality” is not an indication of its existence. For example, “controversy” over climate change or vaccines are more imagined than real (Boykoff, 2015; Carvalho, 2007; Walter et al., 2018). Ultimately, this study thus capture this attitude or opinion expression in text in terms of self-presentation or self-evaluation. Although not as a determinant of legality (e.g. GAO, 2015), this type of analysis may better reveal bias or impartiality in opinion in relation to the agency itself. Although self-evaluation in this study only refers to positive or negative self-presentation, and therefore does not capture the multiple ways of evaluating objects and subjects in discourse, it provides an initial measure of evaluative discourse within government communication with the public on social media.
4. Environmental Factors: Bureaucracy, Media and Politics

In Chapter 2 of this dissertation I discussed various perspectives regarding the nature of government communication with the public. In Chapter 3, a detailed framework for the analysis of government discourse was presented, structured around capturing discursive functions and features of text to understand what and how government agencies communicate on social media sites, in terms of text meaning and structure. In this Chapter, I examine some of the considerations regarding the contexts or and environmental factors that may explain why the government discourse is one way or another. As mentioned in Chapter 2, in the discussion of “purposes” and “goals”, it was noted those concepts may be conceived as causal factors. The purposes of an organization, for example, drive or lead the organization to implement those purposes that are supposed to be an effect or result of the activities of an organization. As such, purposes or functions may be considered a type of “final cause”, in an Aristotelian sense (Aristotle, 1941). However, the environmental factors or contextual attributes of an organization may also be conceived as causal factors that drive, influence or explain its behaviors.

A number of “environmental factors” or “contextual attributes” have been identified in the literature that are thought to broadly influence the communication activities of government agencies. The work of Graber (2003) and Liu and Horsley (2007) proposed a number of “factors”, “attributes” and “environmental characteristics” of the public sector that may impact how government agencies communicate with the public. These include, in their terms: the public good; legal constraints; media scrutiny; devaluation of communication; public perception; lagging professional development; federalism; politics; lack of market competition; complexity; top-level control and others (Graber, 2003, p. 8; see also Liu & Horsley, 2007). Recently, Levenshus (2016) empirically examined the influence of a number of these factors on the context
of government social media communication, more precisely the communication processes of the U.S. Coast Guard. They showed how various attributes, including management support and culture (e.g. “culture of transparency”), “leadership”, the “military context”, and others, all seemed relevant in how the agency used social media. They also found that resource constraints, “decentralized centralization” of operations and the overall context of a military operation influenced the program strategy and processes. However, in the existing literature, the research is focused on examining factors influencing processes rather than the “content products” (Levenshus, 2016), that is, the actual messages, language or discourse of the communication.

In the studies of political discourse more broadly, a number of environmental factors have been considered to influence the language of politicians, heads of states, and legislators, such as “neoliberalization” (Holborow, 2015); “new capitalism” (Fairclough, 2003); “professionalization of political parties” and “celebrity politics” (Davis, 2010). Some of these considerations have been made for analysis of executive government communication but rarely for the discourse of agencies of government or government discourse on social media. Moreover, where government discourse has been discussed, it is rarely with attention to empirical analysis of corpora of social media text messages. In this study, I therefore empirically examine one important relationship and explanation for the quality of the government discourse: changes in political administration, and potential consequences from changes in political party and ideology. However, since other considerations are likely needed to fully explain the contextual factors, I also discuss social media characteristics and bureaucratic characteristics as relevant factors. Specifically, I discuss concepts of social media format and social media logics, as well as bureaucratic mission and bureaucratic stability as important notions to explain the government discourse.
4.1 Bureaucratic Mission and Bureaucratic Stability

In Chapter 2, I discussed various concepts concerning the public bureaucracy and government communication. To take appreciation of some characteristics of the bureaucracy that are likely to play an important role in government communication on social media, I describe two concepts and some potentially useful interpretations: bureaucratic mission, and bureaucratic stability. I articulate the concept of bureaucratic mission as an organizational goal or value, as well as a domain for which these goals are set. This notion is based on existence of explicit statements of mission and goals, but also as more implicit understandings of organizational purpose and direction (Fountain, 2001; Gross, 1969). I also articulate the concept of bureaucratic stability as the idea that bureaucracies have a tendency to be stable and persistent organizations, although at different levels and types of stability (O’Toole & Meier, 2003). This stability may provide continuity in various operations, including communication with the public. Although there are numerous characteristics of bureaucracies that could impact the government social media discourse (e.g. see Hood, 2011; Warwick & Meade, 1980; Wood & Waterman, 1994; Yudof, 1979), the limited nature of this study enables me to only discuss a few basic ones.

Bureaucracies, like other institutions and formal organizations, have explicit goals toward which their actions are directed. Gross (1969) writes that “One might even claim that the notion of a goal is coincidental with that of an organization” (p. 277). Warwick and Meade (1980), based on the “ideal type” characteristics of bureaucracy of Max Weber (1968), write how bureaucracies are determined by: hierarchical structure, which involves a top-down delegation of authority; and formal rules, regulations and standards that guide their operations and personnel behavior—not to mention a technically qualified personnel and offices and positions, (Warwick and Meade, 1978, p. 4-5) all of which assume goals that both help determine the
regulations and are shaped by the formalized and rules-based characteristics of bureaucratic organizations.

Within bureaucratic goals, there is also the application of jurisdictional area, which determines the territorial, the environmental, and to some extent the behavioral quality of the formal rules and regulations (Kawabata, 2001; Weber, 1968; Wood & Waterman, 1994). Although the concept of “jurisdiction” has a strong connotation with the physical territory that a government unit has legal authority over, the concept may be more broadly defined as the “field” or “domain” that bounds the rules and actions of a government agency. Not only is a particular piece of law or regulation bounded to address a particular issue, but also every agency has a particular domain in the world which its work addresses, and this domain has consequences for the character of their work. Whereas “transportation” agencies deal with roads and vehicles, for example, “environmental” agencies will deal with trees and lakes. This is not a clear-cut distinction, of course, since environmental agencies may regulate characteristics of vehicles (e.g. emission standards) and transportation agencies may impact the environment (e.g. by building roads over an environmentally sensitive area). Nevertheless, the jurisdictional area may implicate the discourse of the government agency in terms of topics discussed, extent of scientific information as well as the types of laws and regulations that are referred to in the communication.

In a longitudinal analysis of government discourse, it may also be useful to consider the concepts of bureaucratic persistence and bureaucratic stability. Max Weber had noted himself that “once fully established, the bureaucracy is among those social structures which are the hardest to destroy” (Weber, 1968, p.987). Nowadays, it is not only generally understood that “administrative systems are fundamentally inertial” (O’Toole & Meier, 2003), but also that
public bureaucracies—compared to their private counter-parts—lack change, innovation and entrepreneurship (Box et al., 2001; Manning, 2001). There are many aspects of bureaucracies that persist or are stable over time, including its structure, mission, technologies, procedures and personnel, all of which may be impacted by various social and political factors (Wilson, 2002). Nevertheless, for this general analysis of government discourse on social media, over multiple years and distinct political administrations, it may be sufficient to simply first acknowledge that the general tendency toward stability and persistence of the public bureaucracy may help explain consistency in the social media discourse over time.

4.2 Social Media Format and Social Media Logic

Another important set of contextual factors that likely helps determine the quality of the discourse arise from the social media platform itself. There are a number of studies in discourse analysis and media studies examining the particularities of social media discourse in political contexts (e.g. Barros, 2014; DePaula et al., 2018; Garimella et al., 2018; Huang, 2019; Kelsey & Bennett, 2014; Robertson et al., 2013; Sharma et al., 2017; Törnberg & Törnberg, 2016; Zappavigna & Martin, 2018). The more visually apparent and direct characteristics of the medium that impact the discourse may be the limitations and affordances of the social media format, which constrain the length of messages but also make certain modality of communication possible.

Although there are distinct types of social media platforms with different limitations and affordances, a common feature of social media public “posts”—the public or semi-public text messages, often also referred to as “status updates”—is the relatively short length of text messages. This is particularly so for Twitter, which initially limited the public post to 140 characters (in 2006) but then increased the limit to 280 characters (in 2017) (Perez, 2018). As
such, although users find ways to circumvent the limit (e.g. by paginating each message, as 1 of 
3, etc.; adding text to images), we may expect that generally each post unit contains a relatively 
brief message, with a limited number of clauses (Cvijikj & Michahelles, 2011; Mariani et al., 
2016). An obvious implication of this relatively short message format is that they may be 
relatively quick to generate, and any one user or organization may produce multiple of them per 
day. Other more complex implications of this relatively short format may be directly related to 
aspects of “media logic” and “social media logic”, which I further discuss below.

In addition to the length limitation, the social media format makes available distinct 
“modalities” of communication, also referred to as “media formats” or “media types”, such as 
the inclusion of an image, video, hashtag and/or hyperlink as part of the overall post or message. 
More recently, there has been an increase in the use of “emoticons”, “emojis” and various novel 
symbols as part of text messaging (Jovanovic & Leeuwen, 2018; Parkwell, 2019). These novel 
symbols, still often referred to as *emojis*, include icons of various objects of the world, such as 
trees, stars, people, flags, etc., in addition to the more explicit emoticon that express an emotion 
(e.g. smiley faces, sad faces, etc.). Given the focus of this study on the text of messages, I do not 
explore images, videos, hyperlinks or symbols and emojis. However, I also include an analysis of 
hashtags as part of this study since they are so characteristic of social media.

A hashtag is a single word or term preceded by the “#” (hash or pound) symbol—e.g. 
#USA or #ActOnClimate—included as part of, or as the whole, content of a post. Although not a 
reliable taxonomic system, this type of *social tagging* or *folksonomy* may assist in information 
organization and retrieval (Trant, 2009). At the social level, these tags also have been recognized 
for their “community-building” and “meaning-making” purposes (Bruns & Burgess, 2011; 
Stache, 2015; Lee, 2018). In other preliminary work (DePaula, 2018), I have shown how
hashtags on Twitter created by U.S. government agencies, across the Obama and Trump administrations, seemed to be used to promote certain policies and actions, although many of them could be considered as purely for “indexing” or association purposes. In this study, I consider hashtags as a particular discursive feature, the meaning of which may be dependent on other variables, such as bureaucratic norms and the agendas of specific political administrations.

Lastly, I would like to discuss the concept of social media logic and some of its components as potential environmental or channel factors for the quality of government social media discourse. The concept of social media logic has been developed by van Dijck and Poell (2013) and others (Kalsnes et al., 2017; Tettegah, 2016), based on theories of mass media logic (Altheide & Snow, 1979). Mass media “logic” was first defined as a set of principles regarding how information and messages are conveyed to the public by the, now “tradition”, media—i.e. newspapers, television, magazines and radio. These characteristics, according to (Thorbjørnsrud, 2015) included media “formats, moral and rhythm of news” (p. 181). The format of news is generally short, unambiguous and focused on episodic events. The tone is generally negative, the moral narrative contains personalization strategies and a lexicon of heroes and villains. The rhythm, of course, is fast (Thorbjornsrud, 2015, p. 181).

According to van Dijck and Poell (2013), Altheide and Snow (1979) proposed that one of the principles of media logic was the continuous and intense presentation of information for a short period of time, quickly changing topics, which was also noted to be created to capture and contain the attention of audiences. Another principle of media logic concerned the “neutrality” of the media as objective conveyors of events, evidences and ideas to the public. As van Dijck and Poell (2013) noted, the original theory of media logic was not redeveloped to consider changes in the media and the public, including the development of “niche audiences” and the increased
“commercialization of culture”. This increased commercialization involved an increased mixture of commercials, entertainment, and news, the boundaries of which became “fuzzier”, “all blend[ing] into a seamless flow of images, defined by the televisual laws of ever-shorter sound bites, glitzy shots, and poignant close-ups” (van Dijck & Poell, 2013, p. 4).

In their definition of social media logic, van Dijck and Poell (2013) proposed four principles to explain the most prominent and defining concepts and tendencies of social media: 

**programmability, popularity, connectivity and datafication.** The first concerns the algorithmic processing of information dissemination and social connections, although this programmability gives the user some agency in the steering of content compared to mass media. The second, **popularity**, refers to the ability of social media to record the “like” of a particular user toward a piece of content; define “trending” topics and identify (or create) “influencers” based on the popularity of the content. Thirdly, **connectivity**, which is distinguished from **connectedness**, refers to the basic aspect of platforms that create and mediate the connections that are made among users, content and advertisers. Lastly, **datafication**, as the name suggests, refers to the recording of the various content and connections in the world, and the development of platforms for further analysis and algorithmic development.

The concepts of social media logic developed by van Dijck and Poell (2013) are interdependent and overlapping. For example, they all depend on datafication, since popularity, connectivity and programmability are based on the digital recording and processing of information. Popularity, and the associated concept of **virality** proposed by others as integral to social media (e.g. Klinger & Svensson, 2015), are, by definition, based on the connectivity existent to social media platforms. In addition, it seems that social media logic principles are similar to mass media logic principles but in a more increased or heightened fashion. Moreover,
as others have written, social media are a kind of mass media (Castells, 2019). There are new
dynamics and transformations that have taken place in the world throughout the 20th and 21st
century: the computer and the Internet are inherently different than TV. However, the drivers of
social media logic (e.g. need for speed; competition for attention; economics based on profit;
focus on image-building; episodic narratives of heroes and villains) are broadly representative of
a media logic as well, especially from the perspective of an established institution, such as a
government agency, and we can observe this from the effects of consequences of mediatization
on government (Davis, 2010; Laursen & Valentini, 2015; Nie et al., 2014; Thorbjørnsrud, 2015).

Effects of these norms and tendencies of social media on the government discourse may
not be consistent or clear before investigation. However, the need for popularity, and the logic of
social media as a promotion, branding and self-presentation platform (Attrill, 2015;
Paliszkiewicz & Madra-Sawicka, 2016) may lead to—or may be defined by—a discourse of
“affective” language, positive self-presentation and potentially a frequent use of expressives
(DePaula & Dincelli, 2018; Wahl-Jorgensen, 2019). Although government agencies are
generally not for-profit entities, they may employ social media as a platform for “reputation
management” (Gascó et al., 2017) and produce discourse that actively tries to improve their
reputation, rather than to bring it into question (Hansson, 2017).

There are a number of other concepts and implications of social media that have been
discussed in the literature, which should be of principal concern, since this type of mediatization
across society more broadly seems to have various political consequences, such as political
polarization, the spread of misinformation, and the creation of echo chambers (Adi et al., 2014;
Ceron et al., 2015; Ceron & d’Adda, 2016; Kalsnes et al., 2017; Lillqvist et al., 2016; Sniderman,
2017; Uysal & Schroeder, 2019; Vaidhyanathan, 2018). In the context of government discourse
on social media, the networking and connectivity characteristics of the platforms, as well as the competition for popularity may impact the discourse in a number of ways. For example, we may observe in the messages a substantial number of references to other actors (e.g. other non-profit organizations, government agencies, etc.) that are part of the agency’s network or outside of its network. Other research has observed the extent to which government organizations “reuse” or “share” content created by other agencies (Wukich & Mergel, 2016). Moreover, given social media tendencies for increased popularity, we may also observe a focus on the language of affection and emotions, which are characteristic of social media (Grusin, 2010), and seem to raise user response and interaction with the messages (DePaula & Dincelli, 2018).

4.3 Political Parties and Political Ideologies

Another set of contextual factors that will likely help explain the discourse of government agencies are the parties and the ideologies of the political administration in power and the appointed head of a particular government agency—the “administrator”, or “minister” in other contexts. The “political dimension of government” is a kind of misnomer, as it is probably more correct to speak of the “government dimension of politics”. In a democratic republic such as the U.S., top administrators of government agencies and government ministries are generally officials elected in political processes or appointed by politicians to head the executive government agencies and ministries, and as such are “top-down” political agencies (Wood & Waterman, 1994; Brower & Abolafia, 1997). There is also a “bottom-up” politics within government agencies that explain much of the behavior of the individuals that implement the written laws and regulations and effectively run the bureaucracy (Hirschman, 1970; O’Leary, 2013). As such, government behavior is to a large extent defined by both top-down and bottom-up political processes.
The extent to which political party, political ideology and/or the choices of elected officials are factors in government behavior and the government decision-making process may be referred to as the “politicization of bureaucracy” (Weber, 1968; Wood & Waterman, 1994; Boräng et al., 2018; Laffont & Triole, 1990; Almendares, 2011). This type of bureaucratic politicization has been observed in the context of presidential appointments (Lewis, 2008), regulatory science (Pinto & Hicks, 2019), policy knowledge (Boräng et al., 2018), immigration (Scholten & Verbeek, 2015), among others. In the case of public communication of government agencies on social media, given that the “administrator”, “secretary” or “minister” has some authority and power over what is or is not communicated to the public, the government social media discourse may directly reflect the political parties and political ideologies of the elected officials by explicit statements indicating the corresponding values and goals of these parties and ideologies; indirectly by references to policy preferences and policy agendas; or also indirectly by a correspondence between party and ideology with message-related behavior such as frequency of communication or extent of calls for citizens participation in government.

The political processes of modern democratic countries often include the presence and development of “political parties”—groups or organizations that support the electoral process of individuals into government (Lelkes & Sniderman, 2016). Political parties are often “ideological” since their members, in rhetoric and/or in action, support beliefs and public policies that correspond to an “ideological system”: a system of related interpretations and believes about how the world works and should work (van Dijk, 1998). Ideology is thus descriptive and prescriptive. In the political context, ideologies are related to preferences and believes about the values and merits of certain public policies and government action (Dovers, 2013; Grafton & Permaloff, 2005; Jost et al., 2009). In practice, there are overlapping practices
within distinct ideological systems, and individuals manifest and implement a complex mixture of beliefs and actions (Lelkes & Sniderman, 2016). However, as Grafton and Permaloff, (2005) write, there is a “systematic” relationship between ideologies and policy formulations.

In the U.S., there has been two major political parties since the 1850s, the Democratic and the Republican parties. The U.S. Democratic party is the oldest political party in the world within a democratic-republic context (Janda et al., 2011). It was created by supporters of Andrew Jackson, associated with ideas and persons of Thomas Jefferson and James Madison before him (Janda et al., 2011). It has been considered the party of the “common man” (Witcover, 2003). But it was also the party that supported and fought for slavery. The U.S. Republican party was established in 1854 with the opposition of the expansion of slavery as a principle goal, and a support for “classical liberalism” (Randall, 1947). Abraham Lincoln was the first Republican president. Since the New Deal reforms of Franklin D. Roosevelt, the U.S. Democratic party has been associated with “social liberalism” ideology, and the political “left”, whereas the Republican party is associated with “American conservatism” ideology, and the political “right” (Lelkes & Sniderman, 2016).

Social liberalism and American conservative ideologies are complex systems of thought, the interpretations of which may be more or less distinct in theory. Social liberalism, associated with the political left, is generally associated with support for government assistance to the less fortunate; a more egalitarian, rather than hierarchical, approach to politics; strong environmental and other types of regulations; a support for “civil rights” and a liberal attitude toward private decisions, such as abortion and the use of recreational drugs (Imbeau et al., 2001; Fuchs & Klingemann, 2014; Bobbio, 2016). In the recent context of American politics, implementing
environmental regulation and addressing climate change has been associated with the political left and the U.S. Democratic party (Antonio & Brulle, 2011).

American conservatism, on the other hand, is generally considered in the political right, it is associated with principles of individualism and respect for tradition (Lipsman, 2007) and, in the American context, “American exceptionalism” (Lange, 2019). American conservatism is generally pro-market, and has a liberal attitude toward economic decisions and the liberty of private companies, which is associated with the view of the political right and conservatism more broadly (Imbeau et al., 2001; Fuchs & Klingemann, 2014; Bobbio, 2016). American conservatism and the political right hold values based on religious beliefs (in the U.S. these are Christian values), and are opposed to abortion and the sexual freedoms supported by “the left” (Smith, 2003). More recently, these conservative principles are associated with the U.S. republican party, a disdain for environmental regulation, in particular climate change regulations, and a support for anti-regulatory efforts more broadly (Antonio & Brulle, 2011).

The most direct way we may observe the effect of these distinct political parties and ideologies on the government social media discourse may be with explicit evaluations or judgements of these parties, values and/or positions. However, there are laws in the U.S. concerning “government speech”, and certain ways of communicating—e.g. hiding the agency name when it is an agent of communication with the public—may be illegal (e.g. GAO, 2015). For example, the U.S. Hatch Act (Hatch Act, 1939), in its original language, stated that: "[N]o officer or employee in the Executive Branch of the Federal government, or in any agency or department thereof, shall take any active part in political management or in political campaigns" (ch. 410, § 9(a)). However, government discourse on social media may also be politicized in the sense that the actors and topics represented may restrict the information to be focused on the
issues of most concern to their policy objectives, with may relate to their particular political party and particular political ideology.

The political party and political ideology may also have an impact on the government discourse if it supports a specific type of communication, or more/less communication with the public. In related research, for example, Guillamón et al. (2016) examined the relationships between political ideology of the ruling party and social media use by local governments. Ultimately, Guillamón et al. (2016) found that “ideology” (i.e. right or left) is not significantly associated with the amount of posting or sharing behavior on a social media platform (which they use as a proxy for government transparency). However, the lack of research on government discourse on social media means there is scant evidence of what to expect in this domain. Nevertheless, we may also see an impact of political party and ideology in the government discourse based on the particular personalities embodying those concepts and the expressed policy agendas and policy preferences of these individuals in distinct political parties.
5. Rationale for Studying the EPA on Twitter

To empirically explore the characteristics of government discourse on social media I have selected to study the public posts of the U.S. Environmental Protection Agency (EPA) on Twitter under the Obama and Trump administrations, over a 2.7-year period. There are a number of reasons for this selection which I outline in this Chapter. First, I discuss the EPA as an interesting and valuable agency for this type of investigation as it is a science, educational, regulatory, and historically politicized institution within the U.S. federal government, and therefore may reveal the importance and characteristics of various dimensions of bureaucracies and government communication with the public. I also discuss the role and value of having a longitudinal perspective, that is, an analysis of a corpora of text over a relatively lengthy period of time. Thirdly, I discuss Twitter as a more open, politically and public-oriented social media platform, e.g. compared to Facebook, and therefore more suited for a discussion of government information and communication practices. Ultimately, this is a single agency on a single platform to be observed within a limited period. Therefore, the generalizations that can be made here to other contexts are also limited and recognized. Nevertheless, with the additional recognition that the EPA is an important and potentially critical institution for the health of the entire planet, given the enormity of U.S. industry, economy and consumption in the world (Scheer & Moss, 2012), this case study should provide an interesting, valuable and appropriate scenario to examine government discourse with the public on social media that may, at least at times, be reflective of common political and bureaucratic processes.

5.1 The EPA as Science, Politics and Bureaucracy

The United States Environmental Protection Agency (EPA) is an “independent agency” of the United States Federal government, created in 1970 under President Richard Nixon with
the legislative passage of the National Environmental Policy Act (NEPA) (Collin & Collin, 2006). The agency conducts environmental assessments, scientific research and educational efforts, and is responsible for implementing and enforcing national environment standards and regulations that arise from legislative statutes (EPA, 2013). This institution of the U.S. executive government also creates and implements specific programs to address the environmental issues identified in the laws, and has the power to regulate, fine and sanction businesses and individuals (Schwartz, 2017). Some of its standards and enforcement programs are based on legislations such as the Clean Air Act (1963), Clean Water Act (1972), Endangered Species Act (1973)—some of which were first passed prior to the creation of the agency, but which have since received amendments (Collin & Collin, 2006). Given these mandates, the agency is responsible for dealing with large and potentially impactful issues such as chemical emissions from vehicles, industrial pollutants, cleaning chemical spills and regulating the sources of climate change (Vallianatos & Jenkins, 2015; C2ES, 2018).

The EPA is a frequent direct or indirect topic of academic research in the environmental (Rosenbaum, 2010; Toomey, 2018), sociological (Fisher et al., 2018), health (Schwartz, 2017; Gostin, 2018), administrative (Wood & Waterman, 1994), and political literature (e.g. Jasanoff, 1992; Harrison & Hoberg, 1994; Lewis, 1996; Vallianatos & Jenkins, 2015). Studying the EPA is not to suggest that it is a representative government agency, at the federal level or otherwise. However, as a diverse and important federal government agency, the government discourse of the EPA on social media may provide fertile ground in which to observe relevant patterns of communication related to scientific, political and/or bureaucratic concerns. Moreover, given the EPA’s role in national environmental policy in one of the major emitters of greenhouse gases in the planet, this study also serves as an examination of a significant agency, the communication of
which could be used to greatly improve the health of the planet and help avoid or delay major
global disasters that are and will be due to climate change (IPCC, 2014).

Studying the EPA on Twitter, and more specifically under the Obama and Trump
administrations, also makes sense because it is only recently that is has become possible to
examine the social media behavior or social media conduct of federal agencies of the U.S.
government across two distinct political administrations. Although a few U.S. federal agencies
began adopting social media prior to the Obama administration (the EPA Twitter account was
created in 2008), it was only during the Obama administration that social media became a
popular phenomenon in the U.S. federal government. The subsequent administration, of Donald
Trump, is still in office at the time of this writing. This has thus been the first major transition of
government and political (party) leadership in the U.S. federal government since the rise of
social media in the U.S. federal government (Mergel, 2013a). Moreover, not only is this the first
major transition of U.S. political leadership in a world of government social media, it is also a
substantially distinct transition, as discussed in Section 5.4 below, in terms of the parties,
ideologies and policy preferences that changed.

5.2 Twitter as an Open and Public-Oriented Platform

Twitter and Facebook are currently the most adopted social media platforms in the U.S.
federal government (Smith, 2016). As previously indicated, out of the 9,000 accounts counted by
Smith (2016), 3,159 were found on Twitter and 3,894 were found on Facebook (Smith, 2016).
Therefore, although other social media applications and social network sites are highly popular
in society, such as Snapchat, YouTube and Instagram, they are substantially less popular in
government compared to Facebook or Twitter. Therefore, a study of government discourse on
social media may reasonably begin with the Facebook and Twitter platforms. Although it would
be interesting and valuable to study both platforms and compare how government discourse differs or not among them, time and resource limitations only allow for examination of a single platform at this time. Facebook is an interesting platform to study government messages, but I chose Twitter because it is the platform were U.S. executive agencies are most popular (26.2 million followers on Twitter, compared to 7.5 million followers on Facebook, for the main 15 U.S. federal agencies), and also because Twitter is a more open and public-oriented platform.

I consider Twitter a more open platform because of the following. First, it allows one-directional connections, where one user account may follow another (Wu, 2011) but does not need to be followed by that other account, whereas the basic Facebook “friend” requires a “bi-directional” relationship. Individuals who do not know each other in real life may create connections, and the majority of connections on Twitter have been observed to be between strangers (Huberman et al., 2009). While Facebook “status updates” are by default only for “friends” or “followers”, and therefore are only “semi-public”, Twitter “status updates” (“tweets” or “posts”) are by default public (although now both platforms seem to require an account to fully access anyone’s content on the platform). Lin and Qiu (2013) have also suggested that whereas Facebook is used more for “social connectedness”, Twitter is used more for “information-exchange” (Lin & Qiu, 2013, p.433). Furthermore, Facebook has recently “shut down” their API which has made it difficult, if at all possible, for researchers to access content from public pages for text analysis (Bastos & Walker, 2018; Hill, 2018), and they have also emphasized becoming a more “family” oriented platform in their newsfeed programing (Faltesek, 2016).

These characteristics of “openness” also make Twitter a more “public-oriented” platform, in the sense that it is a platform more open to the public, compared to Facebook. Twitter is also a
more public-oriented platform in the sense that it is a platform where the communication of various public officials and politicians are disseminated to the public and are captured and discussed in the news media. For example, the Twitter posts of U.S. congress members has been observed to have an influence on New York Times content related to congress (Shapiro & Hemphill, 2017), and Twitter communication of political candidates have been found to have a “symbiotic” relationship with the traditional news media (Conway et al., 2015). Although these inter-media agenda setting effects are not always found (Skogerbø & Krumsvik, 2015), potentially given its openness Twitter seems to be the site more visible to public scrutiny, and potentially due to the large number of followers of U.S. government agencies, also the social media site of most interaction between citizens and the U.S. government.

5.3 Political Parties and Policy Agendas: Obama and Trump

As previously discussed, political parties and political ideologies may help explain the behavior of government agents on social media via the expression of specific policy preferences and policy agendas, or with references to terms and expressions generally more associated with a particular party and ideology and explained within that ideology (e.g. “we have a lot of diversity in our agency”; “good for the job creators”). Therefore, in the case of the U.S., the use of social media by government agencies during the Obama and Trump administrations may provide an interesting case to illustrate how political parties and ideologies have been associated with specific policy objectives of each administration, and how this political context influenced or was reflected in the government agency’s discourse. In this section, I briefly discuss the personalities of President Obama and President Trump and the approaches of their administrations to environmental policy and social media.
On his first day in office, January 20, 2009, President Barack Obama, of the U.S. democratic party, signed a “Transparency and Open Government” memorandum calling on executive agencies to increase transparency, participation and collaboration with citizens (Obama, 2009). Although social media were not mentioned in this memorandum, administrators at the U.S. government saw social media adoption as an opportunity to implement the expectations outlined in the executive order (Mergel, 2013a). Moreover, the memorandum was the beginning of a number of initiatives and partnerships which led to National Action Plans on Open Government, Open Government Awards, and the establishment of online platforms such as Challenge.gov (Mergel & Desouza, 2013), and the WethPeople petitioning system (Dumas et al., 2015). It is difficult to suggest that, if it was not for the Obama administration, the U.S. federal government would not be on social media sites—given the proliferation of these platforms across local, regional and national governments around the world. Nevertheless, the approach of the Obama administration toward social media was one where principles “transparency, participation and collaboration” were emphasized and to some extent implemented (Mergel, 2013a; Mergel, 2016).

In 2016, Donald Trump, of the U.S. Republican Party, was elected president of the United States, beginning his term on January 20, 2017. Interestingly, Donald Trump was a frequent user of Twitter before becoming president, and has continued his use of the platform as his public communication device of choice, including to declare policies, fire agency administrators and send all manner of messages to the public, leading to his denomination as the first “Twitter president” (Salama, 2017; Jeong, 2018; Thompson, 2019). Moreover, his use of language on the platform, with bold accusations of “Fake News Media” and a combative, vulgar, expressive and often exaggerated rhetoric, have been defining of his public communication.
On Twitter, President Trump uses his personal account as well as his Presidential account, which has become a legal question given that President Trump has “blocked” other users from following his personal account (Siddique, 2018; Hamilton, 2019). A few legal studies have examined whether or not Donald Trump’s personal Twitter account functions as a public forum, and thus deserves certain legal restrictions (LoPiano, 2017; Siddique, 2018). A number of studies have examined the content of the posts of Donald Trump’s account during the campaign (e.g. Evans et al., 2018), as an “authentic style” of communication (Enli & Skogerbø, 2013), as political “attacks” (Lee & Xu, 2018), and as more negative in its discourse compared to his rival Hilary Clinton (Liu & Lei, 2018). As president, and chief executive of the government, few studies seem to have been carried out on content or discourse analyses of President Trump’s Twitter discourse (cf. Kreis, 2017), despite plenty of commentary on news sites about this activity.

Despite the attraction to social media by President Trump, the administration did not (and does not) seem to have any explicit policy on “open government” or social media use for the executive government, which is a contrast to Obama’s administration. We thus observe in these two individuals two distinct approaches and preferences toward the meaning and use of social media in the executive government. Although it is not clear a priori how these distinct approaches to social media will implicate the discourse of specific government agencies, it is useful to note this background to help explain the discourse observed by the specific government agency at question during the tenure of the top administrators appointed by each president.

Concerning environmental policies—the domain of this case study—President Obama was a believer in the importance of addressing climate change (Broder, 2008), and encouraged a number of environmental policies to tackle this large global issue, including the Clean Power
Plan, which has been considered the hallmark climate change and greenhouse gas (GHG) policy of the Obama administration (Engel, 2015). In this plan, proposed by the EPA in June 2014, greenhouse gas emission targets were established for different states, based on their ability to reduce emissions, what Engel (2015) termed a new type of “cooperative federalism”. In 2015, the Obama administration signed the Paris Agreement, wherein various countries committed to reduce their GHG emissions and address the sources of global warming. Obama appointed Gina McCarthy as his second EPA administrator, who was praised by environmentalists and industry leaders (Smith, 2013), and became an advocate for climate change policies. As a sign of some ideological consistency between party, ideology and policy preferences, these types of environmental regulations and environmental protections have been broadly associated with the political left, and the U.S. Democratic party, as discussed in Section 4.3.

President Donald Trump, on the other hand, concerning environmental policies and environmental issues, repeatedly called global warming a “hoax” (via Twitter) (Jacobson, 2016), and in June 2017 signaled his intention to withdraw from the Paris Climate Agreement. The first EPA administrator appointed by Trump, Scott Pruitt, as attorney general of Oklahoma, had previously sued the EPA for excessive regulations (Gazette Editorial, 2017). President Trump was explicitly interested in cutting environmental regulations, had commented on the potential benefits of and “uncertainty” about climate change, and eventually announced the repeal of the Clean Power Plan in 2018 (Friedman & Plumer, 2018; Lipton, 2018). The transition between the Obama and Trump administrations was also notable given the changes that were made across web pages of various government agencies in the incoming Trump administration. References to and documents about “climate change”, “clean energy” and “greenhouse gases” were removed or hidden from searches of various federal government agencies (EDGI, 2018). In the case of the
EPA, this was “to reflect the agency’s new direction under President Donald Trump and Administrator Scott Pruitt” (EPA, 2017). Similarly in this case we observe some consistency between party, ideology and policy objectives, as the preference for industrial activity and free-markets over environmental regulation has been a characteristic of the political right and the U.S. Republican party, and it was the case with President Trump and his Administrator Pruitt.

These inter-related political factors—party, ideology, and policy agendas will likely not be explicit in the discourse in the form of statements such as “Based on Republican values we support deregulation of industries”. However, these references may appear in the discourse in not so implicit ways, such as with repeated focus on topics related to a particular ideology or policy agenda, and in explicit references to policy preferences such as: “The agency has deemed best to not address climate change”; or “We are committed to improving racial diversity”. There may be other ways in which political party and ideology influence the discourse, for example, such as in the effect that political ideology may have on the adoption of “open communication” and “government-citizen participation”. For example, the political left, who are focused more on direct democracy (Dalton et al., 2001), may be more likely to engage in social media to a greater extent (e.g. in terms of frequency of posting). However, the sheer fact that Trump is an avid user of social media makes this line of argument difficult. Nevertheless, these considerations are made in the empirical analyses of the messages for this study.

5.4 EPA, the Law and Social Media Campaigns

As previously discussed, the EPA is an interesting topic for research on government discourse because it brings together various socially relevant dimensions of environment, education, science, bureaucracy and politics. However, there is another historical fact that makes this agency a relevant and interesting target of investigation for their discourse on social media.
platforms. The legal issues described below point to the active use of social media, and in particular Twitter, by the agency during the McCarthy administration, under President Obama. Given the legal issues discussed, it will be interesting to include this context to help interpret the political and discursive dimensions of social media use in government, and also to compare the activities with the use of the platform by the subsequent administration.

In 2015, the U.S. Government Accountability Office (GAO) published an opinion concerning whether or not the EPA violated legal prohibitions of “publicity or propaganda and grassroots lobbying” (GAO, 2015). Based on Congressional request, GAO investigated whether or not the EPA committed any legal violations, in relation to the prohibitions above, in their activities concerning: Thunderclap, the #DitchtheMyth Campaign, the #CleanWaterRules Campaign, and EPA’s links to external websites (GAO, 2015, p. 3). According to GAO (2015), EPA used Thunderclap—a social media or “crowdspeaking platform” dedicated to promoting messages across other social media platforms—to actively promote a rule, or regulatory approach, for the Waters of the United States (WOTUS) law. GAO found that this campaign “constituted covert propaganda” (p. 11), primarily because a message the EPA constructed to be shared on Thunderclap and other social media platforms did not identify the EPA as the originator of the message.

In another social media campaign, focused on Twitter, EPA employed the hashtag #DitchtheMyth, which was associated with various posts or messages that purportedly provided a “myth” and a “truth” statement concerning its own Clean Water Rule proposals, sometimes asking other users to share the content, or “Tweet the truth”. EPA’s #CleanWaterRules campaign also involved a hashtag being associated with various Twitter messages to support the agency’s and administration’s Clean Water Rule proposals. GAO also discussed the use of two
hyperlinks from an EPA blog post to websites that directed users to petition lawmakers to take a particular position on the Clean Water Rule the agency was supporting. GAO found that the EPA’s use of the #DitchtheMyth and #CleanWaterRules campaigns on Twitter “did not implicate the publicity or propaganda prohibition”, given wide discretion that is given to agencies concerning their use of “self-aggrandizement” language in their messages. However, the report did find that hyperlinks the EPA provided did “constitute grassroots lobbying, in violation of the grassroots lobbying prohibition” (p. 11).

The EPA has a number of guidelines on using social media, like other U.S. government agencies (EPA, 2014a, 2014b). These guidelines stipulate the laws and ethical directives for how government communicators should use social media platforms. Nevertheless, this incident reveals that the EPA has been previously implicated in using “propaganda” and “grassroots lobbying” in their social media use, and it shows how distinct administrations may want to push and promote their policies via government discourse on social media. This study is not a legal analysis of the EPA’s actions, and the findings of GAO indicate the violations occurred due to lack of authorship in one of the messages, and the linking to a website that petitions lawmakers. That is to say: the GAO study did not involve a detailed analysis of the discourse of the agency. In regard to the publicity discourse mentioned in the report, no violation was found concerning the use of promotional language. This study will complement our understanding of EPA discourse during the McCarthy administration as well as the Pruitt administration, and will thus increase our understanding of the more general practices surrounding social media use in the U.S. federal government.
In this Chapter, I outline the methodology for the empirical analysis of this study. To review, the empirical questions of the study are:

**RQ1.** How does the U.S. federal government agency use basic functions and features of text and discourse on Twitter?

**RQ2.** How does the use of discursive functions relate to specific purposes of government communication with the public?

**RQ3.** What are the implications of change in political administration for the nature of the discourse? In particular, how does political party and ideology of the administration in office implicate characteristics of the discourse?

As previously indicated, these questions are addressed by examining the public posts of the U.S. Environmental Protection Agency on Twitter. This study involves a *manual content analysis* of several posts, where each post (or message) is *coded* or *annotated* as having a particular discursive function or feature from the framework (Krippendorff, 2004). The set of messages comprising the dataset, which I also refer to as *corpora* of documents, were broadcast on the Twitter platform throughout a period of 2.7 years, separated apart by approximately 3 years. The messages were independently coded by two human subjects—one of which is the author, and another individual not previously related to this study. This enabled a more objective assessment of the messages in terms of the reliability of the framework categories for coding the social media posts. Although many of the discursive features here are relatively basic, coding and interpreting the messages became complex given the categories and ambiguities of language.

In what follows, I describe the data retrieval process and the creation of the corpora of posts; the steps of preparation for a manual content analysis; and the detailed coding rules that
translate the discursive framework into specific and operationalized coding instructions. I also explain the process of coder training and how the coding tasks were performed. I then discuss reliability measures used for assessment of intercoder agreement. This quantitative distribution of coding categories across time and political administrations is presented in absolute and relative terms and in graphic form.

I then discuss a process to address RQ2, which involves relating discursive functions to the previous discussed government communication purposes. In this analysis, I retrieve a sample of messages that were coded in each speech act category (e.g. directive, commissive, etc.) and assess which government communication purpose seems to be manifested or intended by each of the messages in each of these samples. Since this question emerged after the initial coding analysis had taken place, and given limited time and financial resources for this study, this analysis was only coded by myself and does not have an inter-coder reliability assessment. Because of this, I attempted to only use the “purposes” or “goals” that seemed more specific and that could more easily be used for objective analyses from Twitter messages. This analysis thus only provides initial and exploratory observations of how we may think of the relationship between speech acts and government communication goals.

Lastly, to address RQ3, I discuss how I assess the implications of the political party, ideology and policy preferences of the distinct administrations and administrators on the nature of the discourse. The implications of each political administration may be observed by examining certain discursive behaviors, like frequency of posting and the use of certain speech acts, by each distinct administration. However, the implications from each political administration on the nature of the discourse are more directly examined in this study by evaluating how distinct topic terms as well as hashtags were employed by the agency during the
tenure of each administrator, and how the topic terms and hashtags related to their respective parties, ideologies and policy preferences of the administrators.

6.1 Data Retrieval and Corpora Creation

For this study, I examine the posts (e.g. also referred to as tweets, status-updates or messages) published by the main account of the U.S. Environmental Protection Agency (EPA) on Twitter (https://twitter.com/epa). This account was created in May 2008. As of March 29, 2019, it has produced over 15,000 tweets, and has over 595,000 followers. For this study, I collected two sets of posts corresponding to Gina McCarthy (in office 2013-2016), the administrator under President Obama (in office 2009-2016) and Scott Pruitt (in office 2017-2018), the administrator under President Trump (in office 2017-current). For the Obama administration, I collected posts made during the first 16 months of the administrator Gina McCarthy, which corresponds to posts made from July, 2013 to December, 2014. For the Trump administration, I collected posts made under the first 16 months of administrator Scott Pruitt, which correspond to posts made from February, 2017 to July, 2018.

This selection of data is justified as follows. First, the intention here is to describe general discourse patterns of government on social media. Therefore, to assist in the generalization potential of the study, it will be useful to examine the discourse of various government agencies, or at least one government agency over a relatively long period. This may thus speak to the persistency or stability of the messages as a distinct type or genre of government discourse.

Previous studies of government posts and government messages on social media, mostly carried out within the public administration, e-government, and public relations literature, have generally focused on analyzing relatively short periods of government posted content. For example, in the study of Facebook posts of local governments in Europe, Bonsón et al. (2015)
studied a couple of months, and a single month (Bonsón et al., 2017) of posts. The study of Bellström et al. (2016) focused on three months of content, and the study of Hofmann et al. (2013) focused on one year of content of local government posts on Facebook. One of the early and only general studies of the posts of the agencies of the U.S. federal government on Twitter examined 6 months of content in 2010 (Waters & Williams, 2011), and more recent studies of U.S. scientific and environmental agencies on Facebook have examined 2 weeks (Lee & VanDyke, 2015), and 8 weeks of content (Lee et al., 2018). This study thus provides a contribution to better understand government discourse overtime.

Furthermore, examining the content across two distinct administrations will enable a comparison of the discourse and an examination of implications of change in political administration on the nature of the discourse. I should note that I did not capture for this study the content of the first administrator under Obama, largely because social media were very novel tools in those first years of his administration. Capturing data from 2013 to 2014 focuses on a period where social media were becoming more prevalent and more institutionalized in governments (e.g. Mergel, 2016). Moreover, it should be noted this time period focuses on the first 16 months of the administrator Gina McCarthy, and thus may be comparable with the first 16 months of administrator Scott Pruitt, which together amounts to 2.7 years.

In July of 2018, Pruitt resigned, or “was told to resign” (Jacobs & Dlouhy, 2018), from his position after a number of ethical probes into his behavior—although none of these seemed to concern his use of the EPA’s Twitter account (Davenport et al., 2018). Therefore, Pruitt only stayed as administrator for approximately 16 months. Nevertheless, in total, the time period covered in this study is greater than any other previous study on government use of social media and should provide sufficient content for a detailed discourse analysis of the messages over time.
Government social media content does not seem to be archived by any government institution to be easily provided for public access. Neither the Library of Congress nor the National Archives and Records Administration seem to periodically capture and store Twitter, or Facebook posts, of federal government agencies (of which there may be over 9,000 accounts). Moreover, the open Twitter API will only allow retrieval of a user’s posts to a limited extent back in time; for this agency it is no longer possible to retrieve data with the API before 2015.

Acquiring historic posts from vendors for multiple dates, at $25 dollars quoted per day, would cost $9,125 for an entire year worth of data, which does not seem like a particularly good deal—or even the $4,000 that has also been quoted (Shulman, 2018). Moreover, an open access Python tool has been developed that allows retrieval of older tweets of a user through browser queries. However, the tool does not enable retrieval of retweets—the posts of others shared or redistributed by the account—which then prohibits the analysis of this additional type of content. However, in a recent dataset of tweets and retweets of the McCarthy and Pruitt administrations that were captured for this analysis, the ratio of tweets/retweets for a one-year period was 90/10 for McCarthy, and 72/28 for Pruitt, which shows most of the content broadcast by the agency were tweets. Moreover, as I discuss below, there is a rationale for focusing this study, as I do, with “posts” only, and not “retweets” or “replies”.

6.1.1 Posts, Retweets and Replies

Twitter posts are the original public posts that an agency or account publishes on the platform, which is a type of “broadcast” since it is not (necessarily) directed at any one individual but it is a communication to the whole public. These posts are sometimes called “status updates”. “Retweeting” or “sharing” refers to the re-distribution of a post created by

another account or entity. Therefore, at first sight, and supported by other literature, it is important to think of these activities as distinct types of behavior (i.e. posting versus sharing) (Bonsón et al., 2017; DePaula & Dincelli, 2018). In addition to the difficulty in acquiring retweets, as previously described, it is thus also reasonable to separate the analysis of posts from retweets. Nevertheless, any study of retweets may be carried out in future analyses, when the posts and retweets are available.

A third, and defining, feature of social media platforms is the ability for users to reply or comment on existing posts or other comments on the platform, and potentially developing conversations or discussions. Governments may comment or reply to existing posts generated by others, a behavior which may be conceived as distinct from the main posting or broadcasting behavior. Indeed, others have differentiated posting as “information provision” whereas replies are “dialogue” or “interaction” (Mergel, 2013b; Guillamón et al., 2016). However, replies by large federal government agencies on Twitter do not seem to be common. The EPA Twitter account at question, for example, seems to only have generated a few replies based on retrieved datasets since 2013, and the same seems to be the case with the accounts of other federal agencies (e.g. USDA, Dept. of Defense, Dept. of Education, Energy), based on observations of years of data that could be retrieved from Twitter with existing tools. Examples of such replies were expressives such as “Thank you!” or “Now that’s a festive group!”. From the main 15 U.S. federal agencies on Twitter, the Interior Department seems to be an exception, as they often reply to users. However, similarly, their replies are often simply: “Thanks! We love sharing these fun wildlife pics”.

Although it seems important and interesting to examine how government agencies are responding to user-generated content messages to the government, this study is focused on the
discourse of the broadcast messages, and not user-directed messages. I recognize that this type of reply to users is a reflection of dialogue and a type of citizen-participation, which contributes to this purpose of government communication with the public. It is therefore a behavior that is of interest and should be of concern to others interested in government interaction with citizens via social media (e.g. see Lee et al. 2018). However, once again, we are focused here on the “posts” or broadcast messages on the platform.

6.2 Document Sampling and Preparation

The empirical component of this study involves a manual content analysis of government generated social media posts. Technically, each post is considered a document for purposes of this type of analysis, although these are relatively small or short-text documents. Most documents in this data set are limited to 140 characters, with a small percentage being limited to a maximum of 280 characters. Therefore, the amount of text and therefore the amount of information that it can contain is relatively brief. Each document may contain text, a static image, a video, or other social media posts, usually in a limited way. This means that government communication on Twitter, and other social media as well, is a complex semiotic and aesthetic performance, and makes use of “multi-modal” discourse (e.g. Jovanovic & Leeuwen, 2018). The perspective taken in this study, however, as previously indicated, is focused on the analysis of text.

Based on current calculations, there are 3,815 EPA generated posts from July 18, 2013 to December 14, 2014 (504 days), which are under Administrator Gina McCarthy; and 950 posts from February 17, 2017 to July 6, 2018 (504 days), under Administrator Scott Pruitt. This is a total of 4765 documents. From this count, documents which do not include any text (e.g. are only images or links) were not considered for analysis. Given the complexity of the discourse and
information analysis technique employed here, as well as time limitations to accomplish the study, I selected a random sample of one-quarter of the 3815 posts of the McCarthy population of posts; and one-half of the Pruitt population of posts. This decision was made for the following reasons. Since the McCarthy administration posted more than 4 to 1 the amount of the Pruitt administration, I found it appropriate to reduce the ratio of the sampling to a 2 to 1 ratio, so not to drastically under sample from one side, while preserving the direction of differences across them. Moreover, I needed to acquire a sample that was large enough to provide a representative view of EPA discourse on Twitter, but not long enough to surpass the time and financial resources. The samples selected were thus: 953 posts under the McCarthy administration (25% of population of posts), comprising the McCarthy sample dataset; and 475 posts under the Pruitt administration (50% of population of posts), comprising the Pruitt sample dataset. After removal of posts without textual content, the final sample was: 950 for McCarthy and 471 for Pruitt, for a total of 1421 messages coded based on the framework of discursive functions and features.

Let us now examine what a Twitter document (i.e. a post, a message) entails:

"This agreement will be seen as a historic moment." - @GinaEPA. Read the agreement: 

https://t.co/HVbrBITT9b  #COP21  https://t.co/KJkSXHx5rX

The document contains text in English, a handle reference, more text, a hyperlink, a hashtag and a hyperlink. For purposes of the analysis, all hyperlinks will be switched to a generic <link>. Although it may be interesting to know what these links are, these “short links” are common and often do not explicitly identify a domain (e.g. epa.gov) therefore making it difficult for analysis. Moreover, here we are focused on the text, where hyperlinks may need their own investigation. I also switched all references to the administrators’ names during the coding analysis in order to reduce bias in the coding. For example, all handles @EPAScottPruitt and
@GinaEPA were switched to <administrator> for coding. The same was done to other references to their names, such as Administrator Pruitt, Administrator McCarthy, Gina, Scott Pruitt, etc. The names and references to Barack Obama and Donald Trump were also switched to a generic <president>. The hashtags were preserved but are only used for analysis of the discourse when inside the text clauses themselves. An analysis of hashtags themselves across both administrations is carried out separately. See further coding details in Appendix A.

6.3 Coding Framework and Instructions

Although social media posts are small documents, and may only contain a single textual clause, even a single clause may reflect multiple meanings and information. Given this complexity, the actual implementation of the framework requires some consideration to make the coding of messages practical, staying true to the model and also to reality. To accomplish this, I proposed the following set of coding instructions, in Table 6 below and in Appendix A, to guide coders in the task of assessing the various discursive features described in the framework. To develop these coding instructions, considerations were first made, of course, based on the definitions of what each category meant as presented in Chapter 3. However, the instructions are also based on increasing inter-coder reliability, that is, on developing instructions that may be agreed and understood by more than a single subjective perspective. Moreover, the instructions are based on suggestions from previous literature, where those were found. I should note that this type of corpus-oriented content analysis of discursive features is not common. Nevertheless, I hope to have provided a good balance between staying true to the meaning of the discursive functions and features and providing a reliable and practical method for coding.

Let me illustrate some characteristics of the coding instructions and why they were chosen to be as such. First, I decided to restrict the coding of each speech act, which naturally
occurs at the level of the clause (Halliday & Matthiessen, 2004), to be mutually exclusive. First, each clause is defined as a sentence separated by a full stop (period), exclamation or interrogation sign, which can be objectively observed. However, naturally, each clause may reflect multiple speech acts. For example, the following message: “Read about how our new chemical information database will help American businesses innovate” is both a directive as well as a commissive. It could also be considered a representative. It is a directive because it tells the reader to carry out an action with the presence of the imperative verb (“Read”). Recognition of this imperative verb makes the assessment of directives a relatively objective undertaking. However, the message may also be considered a commitment because it associates the speaker with the quality of some future outcome. To address this ambiguity in coding, I therefore created the rule that the “first” speech act is considered. Because the imperative verb is what gives the clause its definition as a directive, and it comes first, the clause is coded as a directive. This creates a limitation on the study, which is discussed in Chapter 9, but also enables the mutual exclusivity of the coding categories and further objectivity in the coding.

Let us also discuss the nature of a commissive. A commissive is an action that places the speaker in a position of indebtedness to the condition or statement proposed. Therefore, to identify such a discursive function it is necessary to find terms such as “We commit to” or “We promise to”. However, sometimes a commitment may also be established based on the prediction that one makes regarding one’s own actions. If I tell someone my work will produce his firm various positive benefits, I place myself in some state of indebtedness to that individual concerning the outcome of my work. Therefore, in the coding analysis, statements that make such predictions are also considered commitments, such as the following clause: “This plan will not undercut energy reliability” or “The actions we’ve taken to improve the fuel economy of
American trucks will reduce carbon pollution”. However, some statements about the future are only weakly commitments in this sense and serve more as basic representatives. The clause: “Tomorrow at 9pm ET, <president> will deliver his 3rd State of the Union” is a case in point and is coded as a representative.

Concerning representatives, since each clause may be thought to represent something, a clause is only coded as a representative if not first coded as any other of the speech acts. Moreover, the participatory request gains precedence over other speech acts when found. This is done to make sure that whenever these participatory requests are observed they are coded as such. For example, such participatory requests may come in the form of a directive, such as “Write to us your opinions here”. If only coded as a directive, we are not able to capture these types of messages and therefore this instruction was imposed.

The other discursive features of the framework had a similar rationale and required more or less complex considerations for developing the coding instructions. Concerning information representation, the rationale for coding three distinct types of actors was based on being able to objectively identify and differentiate explicit reference to the agency; other government agencies and/or other officials; and external parties. Since social media messages are already very short (approximately 100 characters or 20 words on average) a limit of five topic terms was conceived as potentially sufficient to obtain essential concepts of what the message was about. The instructions for coding scientific and causal information were based on the goals of reliably determining this category, which was perhaps the fuzziest category of them all. However, once again, I also wanted to be able to distinguish vague causal claims (e.g. “Our plans will lead to better jobs”) from more scientific and reliable causal claims (e.g. “Smoking causes cancer”).
<table>
<thead>
<tr>
<th>Functions/Features</th>
<th>Coding Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Directive</strong></td>
<td>An order or command. Generally, clauses in imperative format, such as “Learn how to…”, “Call this number…”, “Check out”. Coded as a binary variable.</td>
</tr>
<tr>
<td><strong>Question prompt</strong></td>
<td>Question used to obtain audience attention; does not reference a way for the user to respond to the question. It may not always include the interrogation sign (e.g. “Did you know: …”). Coded as a binary variable.</td>
</tr>
<tr>
<td><strong>Participatory request</strong></td>
<td>Request, invite or question that provides a means (e.g. link, information) for communicating with the government, e.g. “Are you interested? Let us know here:…”, “Provide your opinion here”. Refers to conversation opportunities. May come in the form of a directive but has precedence in this category. Coded as a binary variable.</td>
</tr>
<tr>
<td><strong>Commissive</strong></td>
<td>Reference to commitment, pledge, or promise being made. May also refer to promises or commitments previously made and now kept. Coded as a binary variable.</td>
</tr>
<tr>
<td><strong>Expressive</strong></td>
<td>Statements of “Congratulations”, “Happy Holidays”, related to celebrations, death or other events/norms. Includes references to morals, values and other sentiment, such as “We honor”, “We are loyal to…”, “Great news!”, etc. Coded as a binary variable.</td>
</tr>
<tr>
<td><strong>Declarative</strong></td>
<td>Statements that declare an action. The utterance itself creates the action that it is supposed to bring about. Not to be confused with announcements of previously declared decisions. Examples include “I/we hereby declare”, “I/we pronounce…”, etc.</td>
</tr>
<tr>
<td><strong>Representative</strong></td>
<td>Description of fact, person, thing, process or situation. At level of clause, only code if clause is not another speech act. E.g.: “Did you know that the agency was created in 1975?” is only a question prompt. Coded as a binary variable for the post.</td>
</tr>
</tbody>
</table>

| **Actor**               | Person, organization or program in message (e.g. EPASaferChoice). Coded as agency (e.g. “we”, “our” “agency_name); government (e.g. another federal agency or federal government actor); external (e.g. external person or organization) or none. Coded as a binary variable for each type of actor. |
| **Topic terms**         | Words, mostly nouns, that define the topic or theme of the message. Do not use actor to reflect topic. May use combination of more general (e.g. climate change) with more specific (e.g. forest fires) terms. Select 3 to 5 terms, where compounds are one (e.g. “climate change” is 1 term). |
| **Statistics**          | Reference to statistical information in the form of percentages, averages, or rates. E.g. “the rate is at 3.9%”, “1 in 7 people”, “21,000 per year”, “98% of all…”. Does not include reference to only numbers (e.g. 5, 4500, 13, etc.). May include trends, e.g. “x is increasing”. Coded as a binary at level of post. |
| **Scientific or causal information** | References to scientific or causal information, such as “X causes Y”, “Z is likely due to”) but not in vague causal claims (e.g. “our plan leads to better jobs”). References to reports and scientific activity (e.g. “we are engaged in studying how…”, “this report shows that…”) may also be coded here. Coded as binary at level of post. |
Identification

Positive and/or negative sentiment recognized from message. If direct reduction of negative, it is considered positive (e.g. “not good” is negative). Criteria is whether or not the message seems to generate a positive or negative feeling for the average person (e.g. “We have many problems. We are ensuring they are addressed” is coded as positive and negative. Coded as two distinct binary variables: positive, negative.

Self-evaluation

Positive or negative way agency or its programs are presented in the message. Any association between agency (e.g. we, agency admin., our policy) and positive or negative action or result (e.g. “improving”, “helping”, “reducing harm”, “have achieved”, etc.). Coded at level of post as either positive, negative, or none/neutral.

Concerning the coding of identification/evaluation, instructions were developed based on the previous principles and suggestions from studies on sentiment analysis (e.g. Mohammad, 2016; Pang & Lee, 2008; Rosenthal et al., 2017). Sentiment analysis of text has been carried out in previous studies based on identification of features of text (e.g. words grammatical expressions, emoticons) that generate a positive or negative sentiment on a human reader. Let us note that this classification is based on terms that may trigger a positive or negative feeling on an average person (e.g. pollution, toxic, improving, benefit, etc.), and not necessarily a classification based on “sentiment” terms (e.g. happy, sad, excited, nostalgic, etc.). Previous studies have carried out analysis of sentiment and psychological valence in text in a variety of ways, mostly involving one of the following. One is using a single 5-point Likert scale, where a piece of text is judged to be strongly negative, negative, neutral, positive or strongly positive (Lind et al., 2017). Another method involves a 3-point Likert scale, where a piece of text is coded to be negative, neutral or positive (e.g. Pang & Lee, 2008; Rosenthal et al., 2017). A third method is coding a piece of text on two binary scales: one for positive (1 or 0), and the other negative (1 or 0). For our analysis, this latter method is selected to enable identification of both positive and negative content in a single message. This approach was selected as some messages appeared to have both positive and negative content.
The coding of self-evaluation is similar to the coding of positive or negative content except it includes an analysis of an entity (i.e. the agency) toward which the sentiment is directed. The more objective term for this analysis may be one of assessment of self-presentation. Although, theoretically, a message may include both a positive and a negative presentation of the agency itself, subsequent to the analysis no instances of negative self-presentation were found.

I should also note that the ultimate choices for these instructions, as articulated in Appendix A in detail, in addition to being derived from a goal to increase objectivity of the analysis, were also derived from initial tests of the framework and were slightly modified subsequent to the training of the coders. Without observing the actual messages that are generated on these platforms it is difficult to hypothesize how well such a framework may be used for coding these messages. Therefore, decisions made here are in part based on previous familiarity with the dataset, and results from the coding training task.

Let us now examine the coding protocol, first with the example:

“DYK most people spend 90% of their time indoors? Make sure your home is safe and healthy. #KidsEnvHealth”

First, the analysis consists of examining the speech acts involved. A clause is coded only as one speech act. Since every speech act may be considered a type of assertion or representative, this speech category is only coded if no other discursive category seems appropriate. “DYK” generally refers to “Did you know” (or “Do you know”), and therefore this is coded as a question prompt. This is considered a question prompt for purposes of this study since it is not a request to actually obtain an input from the user/reader/citizen but serves to identify specific individuals for
whom the message may apply. The second clause is a directive, as it instructs or commands the reader to carry out an action. This message therefore has two speech acts, one for each clause.

Secondly, we examine information representation. There is no individual or organizational actor in this message. The topic terms may be considered as “people”, “time”, “indoors”, “safe” and “healthy”. The identification of topic terms is perhaps the most subjective in this framework. However, since messages are relatively short, choosing 3 to 5 terms of the message generally can give an indication of what the message is about. This may involve identifying more general and more specific terms that can give a general idea of what the message is about. For this example, those 3 terms selected give a sense of what the message is about without repeating similar concepts (e.g. the terms “home” and “indoors”; and “safe” and “healthy” and relatively similar). Since the hashtag is outside of the clauses, it is not included as part of the topic terms. Hashtags are also later examined in a separate hashtag analysis and are thus not analyzed within the main framework of discourse components.

Lastly, the message is coded for identification/evaluation. The instructions direct the annotator to note positive and/or negative terms and the overall sentiment brought on from the message. This message clearly has positive words (“healthy” and “safe”) and therefore it is considered to have positive content or sentiment. However, since there is not explicit reference to the agency or agency personnel, self-presentation is coded as none.

Let us take a look at another example:

“Great news! Our new rule helps protect all of us from harmful formaldehyde vapors.

Learn more. <<hyperlink>>”

In this example, the first clause is an expressive—a brief expression that reflects a sentiment. The second clause is a representative and the last clause is a directive. The second
clause could also be conceived as a *commissive*. However, in order to avoid a type of scope-
crease of the concept of commissives, commissives were explicit reference to “commitments”,
“pledges”, and/or “promises” or statements about the future outcome of some action. The *actor*
is *agency* (i.e. “Our new rule”), and the *topic terms* may be: “new rule”, “protect” and
“formaldehyde vapors”. Since the relationship “Our new rule helps protect” does not seem like a
scientific causal relationship but more like an overly generic evaluation, it is not coded as
*statistical or causal information*. Lastly, this message gives an example of the approach to
coding for positive and negative content. This post is coded as having *positive content* because it
seems to generate positive sentiment (e.g. “great news”, “new rule helps protect”). However, this
message is also coded as having *negative sentiment* since it indicates that there exists “harmful
formaldehyde vapors”. In cases where the negation of the negative is direct and absolute (e.g.
“there are no more problems”) the message is coded only as *positive*. However, when the
message gives an impression that there is still an existing harm, the message is also coded for
generating negative sentiment. Regarding *self-presentation*, the message is clearly positive (“Our
new rule helps protect”). See Appendix A for further details.

### 6.4 Number of Characters in a Post

On November 7, 2018, Twitter changed its maximum allowed number of characters per
tweet from 140 to 280 characters. This means that, after this day, we could have found posts with
longer messages than posts made previous to this day. However, one year after this change,
research from Twitter itself found that only 1% of overall tweets actually used 280 characters,
and 12% were longer than the original 140 characters (Perez, 2018). Also, the possible amount of
textual content is still relatively small at 280 characters. Moreover, based on a calculation for this
study, posts created during the McCarthy administration were on average 98 characters long,
whereas posts made under the Pruitt administration were on average 114 characters long. Therefore, on average, the posts of the latter administration only contain 2 or 3 words more than the posts of the previous administration. As such, I did not see that the difference in character limits within the corpora of text messages posed an issue.

Nevertheless, to understand what this means for the coding of messages in this study, I also present an example of a post which is longer than 140 characters:

“Delisting #Superfund sites happens when all cleanup work is done and no further action is needed to protect human health & environment. Deleting sites or portions of a site from the NPL can lead to redevelopment: one of <<administrator>>’s goals. <<hyperlink>>”

This post was classified as only a representative speech act. If the same speech act is repeated in the same message, it is only coded once. The only individual or organizational actor is the agency’s administrator, and therefore this feature is coded as agency—notice how the second sentence may be read as beginning with: “One of the administrator’s goals is to …”). The topic terms may be coded as “Superfund”, “cleanup”, “human health”. There are no statistics, and the causal relationship expressed in “NPL can lead to” does not seem scientific enough to warrant classification. The overall sentiment is positive, and self-presentation is positive (i.e. our action leads to redevelopment, and “no further action is needed to protect human health”).

6.5 Coder Training and Coding Tasks

Although some dimensions of the discourse are more difficult to code than others, overall the framework is constructed so that a reliable assessment may be obtained across individuals. Nevertheless, some amount of training is generally necessary to familiarize the coder with the framework and the coding protocol. Lind et al. (2017) have recently shown that content analysis of “evaluations” in text regarding political actors and actions—determined on a valance scale
(e.g. more positive or more negative)—yields more reliable results when conducted by a few highly trained annotators or a few annotators with familiarity with the process of content analysis and the domain, compared to crowdsourced workers. For this study, I thus employed 1 (one) other external individual (“coder” or “annotator”), in addition to myself, to assist in the coding task and to obtain reliability measures. A coder that has advanced understanding of English and writing (i.e. a Bachelor’s degree in English), a limited familiarity with the context of the study, and is a native speaker of the language, was employed in this task.

We—the other coder and I (i.e. the coders)—trained ourselves on 100 posts (approximately 7% of the dataset) based on the initial annotations and explanation of the categories. This training session took approximately 6 to 7 hours. We discussed the coding instructions, coded this sample together, and made any elaborations necessary to the coding instructions. We then independently coded a set of 150 posts. In order to understand the quality of this coding process, reliability measures were obtained based on this “first iteration”. We together examined and discussed discrepancies and agreed on an assessment of the categories where discrepancies were found. We then produced revised coding instructions. We then independently coded another set of 150 posts to obtain a second round of reliability measures (“second iteration”). After obtaining these coding results, we discussed discrepancies, and agreed on an assessment of the categories where discrepancies were found. A few changes were made to the instructions. The final instructions for this coding task can be found in Appendix A.

The remaining posts (1021) were divided among the coders for independent coding (I coded 521 posts; the other coder 500). Similar content analysis often use 20% of the coded dataset to obtain reliability measures, as was done in this study (Krippendorff, 2004. In some instances, only the authors code the data (Krippendorff, 2004) and in other instances, all data are
independently coded by external annotators (e.g. Lind et al., 2017). Given resource constraints in this study, only a subset of the data (20% of the sample) was coded by multiple coders. The external coder was financially remunerated at $20 dollars an hour for her assistance to incentivize careful and accurate participation in the study.

6.6 Reliability Measures

Since this empirical study essentially involves a type of content analysis, a number of quantitative measures may be used to assess the reliability of the framework, often referred to as “inter-coder” or “inter-rater” reliability agreement (Lombard et al., 2002; Krippendorff, 2004). Since the framework uses binary variables, and the coding tasks involve two independent coders the inter-rater agreement measures are relatively standardized. The most common measures of such reliability assessments are percent agreement, Cohen’s Kappa (κ), Krippendorff’s alpha (α), Scott’s pi (π) and Gwet’s AC1 (Krippendorff, 2004). Percent agreement is simply the percentage of items that are coded the same across two or more human coders. Although the measure is easy to compute and interpret, the shortcoming of this measure is that it does not consider the extent to which the same coding across annotators may have been achieved by chance, or other considerations regarding how prevalent or likely a particular feature is present in the dataset. Both Cohen’s kappa and Krippendorff’s alpha take chance into consideration in their measure of inter-rater reliability, providing a more conservative and more reliable assessment.

The general formula for considering chance in a measure of inter-rater agreement is:

\[ 1 - \left( \frac{A_o}{A_e} \right) \]

where \( A_o \) is a measure of the disagreement across coders observed, and \( A_e \) a measure of the expected disagreement when chance prevails (Krippendorff, 2004).
As explained in Krippendorff (2004), Figure 1 summarizes the various measures and calculations for coefficients of inter-rater reliability. The top component of Figure 1 describes a situation where 2 coders may code a single variable or feature as either 0 or 1 along N instances or items. We may assume that the chance or “logical” probability of each value is 50%. Letters a, b, c and d refer to total number of instances or items that are coded as either 0 and 0, 0 and 1, 1 and 0, or 1 and 1, respectively for Coders 2 and 1. Although percent agreement may be used to have some understanding of the coding task results, Krippendorff (2004) strongly suggests against its use in content analyses. Scott’s pi, Krippendorff’s alpha, and Cohen’s kappa all produce similar results, and all perform well when variables or features are evenly split; where approximately half of the items are coded as 0 and half as 1. However, many dimensions may be more naturally occurring in the dataset, where we still wish for reliable annotation. Gwet’s AC1 was developed for this type of task, as it expects some skewing of the data. However, there are
no prior assumptions in this study about the structure of the results. Therefore, as similar studies of this kind, inter-rater reliability is assessed in this study via various measures, including Gwet’s AC1, Krippendorff’s alpha and Cohen’s kappa, all of which are popular in the literature of content analyses (Lombard et al., 2002, 2010).

6.7 Reliability Results

Coding reliability for all of the binary features of the framework was computed via several measures of inter-coder agreement in two coding iterations, each of which included 150 posts. For each post, each feature could have a value of 1 or 0, and was independently coded by two individuals. Although, self-evaluation was a feature that could also have a value of -1, no such classification was made in the training set, and ultimately not in the entire dataset either. Therefore, effectively this was a 2-value feature. Additionally, the category of declaratives was not found in the entire dataset. Therefore, this feature is not reported below. As presented in Table 7 below, the measures calculated include Gwet’s AC1, Cohen’s kappa, kappa’s 95% Confidence Interval, Scott PI and Krippendorff’s alpha.

6.7.1 Speech Acts

The speech acts had a relatively high reliability assessment overall, both in the first iteration and second iterations. In the first iteration, all speech acts, except expressives and commitments, are above 0.7 for most reliability measures. Given the discussion and review of issues in the coding, refinement of the coding rules led to reliability measures generally above 0.8 and 0.9, for most reliability measures, which is generally considered “strong” (McHugh, 2012). Explanation of such strong measures of reliability are likely due to the relatively specific and rigid coding rules for most of the speech acts. To recall, for example, directives were always noted when a verb was in the beginning of a sentence in an imperative form. Therefore, this did
not involve much subjective judgment on the part of the coder. *Commissives* was the feature with the lowest reliability measures, but refinement of the rules led to strong reliability measure for this category as well.

### 6.7.2 Information Representation

Most features concerning information representation have relatively high reliability measures, although the category of *scientific and causal information* was not particularly strong in the first and second iterations. Identifying the *agency*, another federal government entity, or an *external actor* was a relatively reliable activity, particularly in the second iteration of coding, where values for these three categories are above 0.9 for most measures of reliability, which is generally considered “strong” or “almost perfect” (McHugh, 2012). The *statistics* category was above 0.8 for most reliability measures. *Scientific and causal information* had a reliability measure of .4 in the first iteration and only about .65 in the second iteration, which is an improvement, but from “weak” to “moderate”. We find in these results that the concept of *scientific and causal information* requires further clarification and specification to be more reliably understood and coded across human subjects.

### 6.7.3 Sentiment and Self-evaluations

The reliability measures for *positive* and *negative sentiment* and *self-evaluation* were approximately 0.7 in the first iteration, for most measures of reliability, which may be considered “moderate”. Moreover, in the first iteration *positive sentiment* had weak reliability measures (around 0.4). We realized this was the case given unclear directions on how to code common statements such as “Learn more” and “Check out our new…”. We decided to determine whether such expressions would be coded generally as “positive” or “neutral”. We decided that “learn more”, for example, had a slightly positive feeling, and could generally be regarded as positive.
However, we did not consider the presence of the word “learn” or the word “more”, by themselves, as positive. See further details on coding rules in Appendix A. The lower reliability values for items in this category are probably due to the more subjective and interpretive nature of the categories. Nevertheless, as previously noted, kappa and alpha measures above 0.7 are often considered “moderate” (McHugh, 2012).

### 6.7.4 Topic Terms

The inter-rater reliability measure of topic terms—words from each post that could be used to identify the “topic”, “theme”, or the information that the post is about—was computed by two simple measures developed for this study: a) the number of terms identified from each post that match across coder 1 and coder 2, over the total number of terms identified from both coders (i.e. percentage of matching terms over total terms); and b) the number of terms that match across coder 1 and coder 2 per each post (i.e. average matching terms per post). For both iterations, the percentage of matches is about 70% while the average matches per post is approximately 3 in the first iteration, and 3.2 in the second. Recall that topic terms were set to be between 3 and 5, and therefore an average of three topic terms per post seems to be moderately good. It should be also noted that this is a relatively naive and conservative measure as it was automatically computed based on strict matches of characters in each term (all lowered case). For example, the terms “sustainable” and “sustainability”, and “partnership” and “partnering” were not considered a match, although, of course, they may refer to the same content or topic. This conservative measure does not seem too problematic, as approximately 3 posts matched per post across coders in this partial analysis, and some topic terms that did not match may have had similar coding across the two coders, suggesting even better results for the overall analysis.
Table 7

Reliability Measures for Binary Discursive Features and Topic Terms

<table>
<thead>
<tr>
<th></th>
<th>Alpha</th>
<th>Kappa</th>
<th>Kappa 95% CI</th>
<th>Scott PI</th>
<th>Gwet’s AC1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First iteration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>directive</td>
<td>0.877</td>
<td>0.877</td>
<td>(0.8, 0.95)</td>
<td>0.877</td>
<td>0.883</td>
</tr>
<tr>
<td>rhetorical</td>
<td>0.824</td>
<td>0.824</td>
<td>(0.7, 0.95)</td>
<td>0.823</td>
<td>0.937</td>
</tr>
<tr>
<td>participatory</td>
<td>0.701</td>
<td>0.701</td>
<td>(0.41, 0.99)</td>
<td>0.700</td>
<td>0.971</td>
</tr>
<tr>
<td>commissive</td>
<td>0.605</td>
<td>0.607</td>
<td>(0.3, 0.92)</td>
<td>0.604</td>
<td>0.956</td>
</tr>
<tr>
<td>expressive</td>
<td>0.529</td>
<td>0.529</td>
<td>(0.21, 0.85)</td>
<td>0.527</td>
<td>0.940</td>
</tr>
<tr>
<td>representative</td>
<td>0.773</td>
<td>0.772</td>
<td>(0.67, 0.88)</td>
<td>0.772</td>
<td>0.800</td>
</tr>
<tr>
<td><strong>Second iteration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>agency</td>
<td>0.869</td>
<td>0.868</td>
<td>(0.78, 0.95)</td>
<td>0.868</td>
<td>0.890</td>
</tr>
<tr>
<td>govt</td>
<td>0.716</td>
<td>0.715</td>
<td>(0.51, 0.92)</td>
<td>0.715</td>
<td>0.944</td>
</tr>
<tr>
<td>external</td>
<td>0.705</td>
<td>0.704</td>
<td>(0.5, 0.9)</td>
<td>0.704</td>
<td>0.935</td>
</tr>
<tr>
<td>statistics</td>
<td>0.647</td>
<td>0.646</td>
<td>(0.37, 0.92)</td>
<td>0.645</td>
<td>0.955</td>
</tr>
<tr>
<td>scientific</td>
<td>0.412</td>
<td>0.412</td>
<td>(0.12, 0.71)</td>
<td>0.410</td>
<td>0.889</td>
</tr>
<tr>
<td>negative</td>
<td>0.763</td>
<td>0.762</td>
<td>(0.63, 0.9)</td>
<td>0.762</td>
<td>0.894</td>
</tr>
<tr>
<td>positive</td>
<td>0.409</td>
<td>0.408</td>
<td>(0.13, 0.68)</td>
<td>0.407</td>
<td>0.870</td>
</tr>
<tr>
<td>evaluation</td>
<td>0.747</td>
<td>0.747</td>
<td>(0.64, 0.85)</td>
<td>0.746</td>
<td>0.747</td>
</tr>
<tr>
<td><strong>topic terms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of matching terms across coders: 70.73%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average matching terms per post: 3.086</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>directive</td>
<td>0.932</td>
<td>0.932</td>
<td>(0.87, 0.99)</td>
<td>0.932</td>
<td>0.934</td>
</tr>
<tr>
<td>rhetorical</td>
<td>0.949</td>
<td>0.949</td>
<td>(0.88, 1.02)</td>
<td>0.949</td>
<td>0.982</td>
</tr>
<tr>
<td>participatory</td>
<td>0.938</td>
<td>0.938</td>
<td>(0.82, 1.06)</td>
<td>0.938</td>
<td>0.992</td>
</tr>
<tr>
<td>commissive</td>
<td>0.868</td>
<td>0.868</td>
<td>(0.69, 1.05)</td>
<td>0.868</td>
<td>0.985</td>
</tr>
<tr>
<td>expressive</td>
<td>0.953</td>
<td>0.953</td>
<td>(0.86, 1.04)</td>
<td>0.953</td>
<td>0.992</td>
</tr>
<tr>
<td>representative</td>
<td>0.945</td>
<td>0.945</td>
<td>(0.89, 1)</td>
<td>0.945</td>
<td>0.947</td>
</tr>
<tr>
<td><strong>Second iteration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>agency</td>
<td>0.938</td>
<td>0.938</td>
<td>(0.88, 1)</td>
<td>0.938</td>
<td>0.953</td>
</tr>
<tr>
<td>govt</td>
<td>0.920</td>
<td>0.920</td>
<td>(0.76, 1.08)</td>
<td>0.920</td>
<td>0.993</td>
</tr>
<tr>
<td>external</td>
<td>0.945</td>
<td>0.945</td>
<td>(0.87, 1.02)</td>
<td>0.945</td>
<td>0.982</td>
</tr>
<tr>
<td>statistics</td>
<td>0.859</td>
<td>0.859</td>
<td>(0.7, 1.02)</td>
<td>0.859</td>
<td>0.977</td>
</tr>
<tr>
<td>scientific</td>
<td>0.657</td>
<td>0.657</td>
<td>(0.44, 0.87)</td>
<td>0.656</td>
<td>0.927</td>
</tr>
<tr>
<td>negative</td>
<td>0.760</td>
<td>0.760</td>
<td>(0.64, 0.88)</td>
<td>0.760</td>
<td>0.827</td>
</tr>
<tr>
<td>positive</td>
<td>0.746</td>
<td>0.747</td>
<td>(0.59, 0.91)</td>
<td>0.745</td>
<td>0.921</td>
</tr>
<tr>
<td>evaluation</td>
<td>0.746</td>
<td>0.745</td>
<td>(0.64, 0.85)</td>
<td>0.745</td>
<td>0.745</td>
</tr>
<tr>
<td><strong>topic terms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of matching terms across coders: 69.68%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average matching terms per post: 3.234</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.7.5 **Overall Reliability Assessment**

Overall, the results provide moderate and strong evidence of the reliability of human coding of the framework. These results provide evidence that these discursive features may be differentiated by humans as distinct categories in the messages of a U.S. federal government agency on Twitter. However, some features were more reliably coded than others, and this provides evidence of the difficulty in assessing certain features of discourse, most pronouncedly the features related to sentiment, the notion of scientific and causal information, as well as the determination of “topic” from a single social media post. Although these pose some limitations, I further discuss them in Chapter 9 below.

6.8 **RQ1: Assessing Prevalence of Features Across Administrations**

To answer RQ1 and assess the distribution of discursive functions and features of text across the datasets, counts and percentages of the coded categories are provided for the McCarthy and Pruitt datasets separately, and bar graphs are presented to visualize the differences across the two administrations. This basic quantitative assessment shows the prevalence of the distinct discourse categories that appear in the distinct 16-month periods analyzed. I also provide a count and visualization of the prevalence of a combination of discursive features in the same message (e.g. the use of question prompts with directives, and posts with positive and negative sentiment) which seemed interesting after observation of the results.

*Topic terms* is a slightly distinct discourse category in this framework from all others, as it is not assessed via binary coding but via identification of terms from the message that may reflect the overall theme or topic of the message. Therefore, it would be impractical to show a count of each topic term—there are hundreds of unique topic terms. The topic terms and their quantity are thus presented in a list of the *most frequent topics terms* for each administration. The
topic terms more particular to each administration are then compared and contrasted based on the parties, ideologies and policy preferences of each administration. Further details about this analysis is provided below to address RQ3.

6.9 RQ2: Relating Discursive Functions to Government Purposes

To address RQ2, which involves answering how discursive functions relate to goals of government communication, I provide an additional coding analysis that interprets the goals or purposes toward which each government message could be judged to be pursuing. This analysis is focused on the distinct speech functions, and not on the other features of text (e.g. topic, positive/negative polarity) since it is assumed those are even more generic characteristics of discourse which may be used for a large variety of government purposes. Examining the functions in relation to goals at least provides some preliminary understanding how more structural (i.e. lexico-grammatic) aspects of language are used with or for more specific government communication goals. Table 8 is provided below for a list of the goals and purposes of government communication used in this analysis.

In this analysis, for each category of speech act/speech function, I retrieved a random sample of 30 posts from the combined sample datasets. The relatively small sample of 30 is used to provide a manageable set of messages to analyze and only an initial study of this type of relationship. As previously indicated, given resource and time constraints coding with an additional annotator was not possible for this task. I read each message and coded which purpose the message could be pursuing. Every message could be coded in more than one category. Only a fraction of purposes were used for this analysis, namely those purposes that could be more easily used to ensure objective and accurate coding of the messages. Although I intended to be objective and accurate, these results do not have inter-rater reliability measures.
## Table 8

**Government Communication Purposes Defined for Assessment of Messages**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Interpretation for analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agency centered</strong></td>
<td></td>
</tr>
<tr>
<td>Blame-avoidance</td>
<td>Attempt to direct blame or culpability for an action onto another entity, individual or organization.</td>
</tr>
<tr>
<td>Counter-act media</td>
<td>Direct rebuttal, denial or disproving of an account publicized by a media outlet</td>
</tr>
<tr>
<td>Positive self-presentation</td>
<td>Presentation of agency, agency program, or personnel in a positive light or framing.</td>
</tr>
<tr>
<td>Policy promotion</td>
<td>Positive presentation of a particular law or regulation or call to support a law or regulation.</td>
</tr>
<tr>
<td>Networking (Internal)</td>
<td>Reference to individual(s) or organization(s) within federal government, or group thereof. Includes agency employees.</td>
</tr>
<tr>
<td><strong>Citizen centered</strong></td>
<td></td>
</tr>
<tr>
<td>Information provision</td>
<td>Reference to a specific fact of matter, specially provided in a quantitative way. Does not include statements about future outcomes. If other purposes are determined, not double coded here</td>
</tr>
<tr>
<td>News/Notification</td>
<td>Information provision of a recent fact, such as announcement of recent, future or past event.</td>
</tr>
<tr>
<td>Crisis communication</td>
<td>Reference to a relatively immediate threat, such as flood, hurricane, or other natural disaster.</td>
</tr>
<tr>
<td>Moral suasion</td>
<td>Plea, request or incentive for citizen to commit a social good or adopt a particular social value.</td>
</tr>
<tr>
<td>Networking (external)</td>
<td>Reference to an individual(s) or organization(s) outside of federal government, or specific group thereof.</td>
</tr>
<tr>
<td>Dialogue/participation</td>
<td>Reference to dialogue with citizens or citizen participation in government.</td>
</tr>
</tbody>
</table>

To facilitate this additional coding analysis, Table 8 is provided with an interpretation of the more specific government purposes from Tables 1 and 2 in Chapter 2. This brief interpretation and instruction for analysis is only to guide the assessment, and not to provide a conclusive and comprehensive assessment of each government purpose. Table 8 above only
includes the more specific government purposes because they may be observable at the level of a single message. Further explanation for each government purpose may be found in chapter 2. For the result of this analysis, I present the percentage times each purpose was used with each speech function. A purpose not listed indicates that no message (in the sample) containing that specific speech function was found associated with that purpose. Theoretically, any speech function may be used in a message intended for any a government purpose. This analysis thus shows the purposes that are most likely associated with each particular speech act, and an example of how the actual messages are presented.

6.10 RQ3: Implications of Political Change on Discourse

The third research question of this study concerns the implications of change in political administration on the nature of the discourse. I do not develop in this study theoretical explanations a priori on how political parties or ideologies may implicate the use of specific discursive functions and features of text. For example, I do not believe there is a theoretical basis to expect that U.S. Democrats will employ more (or less) question prompts, or more or less commissives than U.S. Republicans. It may be reasonable to suggest that the participatory request speech act is used more often by the political left and the Democratic Party in the U.S., since theoretical and empirical evidence suggests higher turnout in elections will benefit this party (Radcliff, 1994), that there are more registered Democrats than Republicans (Gallup, 2015) and that Democrats are known as the party of the “common man” (Witcover, 2003). However, given the generic quality of the speech acts of this framework they may all be observed within distinct ideological systems.

As previously discussed, we may observe a direct effect of the political party, and the respective ideology of the administration and administrator in office, on the information
represented in the discourse as well as the evaluation of this information. This may be done via positive or negative references to the respective parties or ideologies of those in office, or via reference to specific policy preferences. To observe possible distinctions in the discourse of the two political administrations analyzed, I compile a list of the most frequent topic terms as well as the most prevalent hashtags employed under each administration. For each dataset, an overall list of the 35 most frequent topic terms are retrieved. The number 35 was a relatively arbitrary number to provide a quantity that is not too short and too long to visualize and study. However, since the analysis of topic terms includes identification of relatively common nouns, as well as verbs and adjectives, the original most frequent topic terms included words that do not by themselves identify a specific topic. For example, a topic term for a single message could be “day” or “child”. As such, I created a clean list of topic terms that did not include the overly generic topic terms that appear in both datasets. Using this “clean list” of most frequent topic terms, which were derived from the sample datasets, I then produced a count of the prevalence of each of these topic terms in the overall population of posts for each administration (within the 16-month period). This analysis thus provides the most common and unique topic terms and how often they were used by the agency under each administration. The terms remove from this list can be observed in Appendix B.

To better evaluate how these distinct topics and themes relate to the political parties, ideologies and policy preferences for each administration, I selected three sets of topic terms prevalent under each administration, and retrieved the messages containing these terms. These sets of terms ultimately were: Clean Power Plan, Climate Change and Superfund; Hurricanes, flood and water; and Business, progress and America(n). These topics/topic terms are chosen because they are prevalent in the discourse of each and/or both administrations, and can reflect
both ideology and policy preferences of the political parties, as well as content that is more “apolitical”, that is, content specific to the environmental protection agency. I then interpret and discuss the messages related to these topics in the context of the party, ideologies and policy preferences of each administration. I also carry out an analysis of the most common hashtags employed in each and across both administrations. This helps show how certain ideologies and policy preferences may have been part of the discourse of the government agency under each political administration.

With this analysis of topics and hashtags, as well as the comparison of discursive functions and features across the two administrations, we see a relationship between the ideologies and policy preferences of each administration and characteristics of the discourse. However, this analysis also reveals that changes in administration cannot account for all changes in characteristics of the discourse. More specifically, changes in political administration cannot account for much of the consistency of the discourse overtime, which may be related to characteristics of bureaucratic jurisdiction and stability, as well as characteristics of social media more broadly. For example, we shall later see that the observation of a large degree of positive self-presentation is explained by the fact that the user (the agency) has control on how to present itself via its own social media channel. Government agencies, like other users, provide a curated and overwhelmingly positive image of themselves on their own social media channels. These relationships are further discussed in Chapter 8. In Chapter 9, I discuss some limitations of these methods, considering the scope of this study, as well as avenues for future research.
7. Results

In this section I present the results of the empirical analyses, which address the three main research questions of this study. In the final analysis, the McCarthy random sample used is approximately one quarter of the total number of posts (950 / 3815) made by the EPA under the first 16 months of Administrator McCarthy (July 17, 2013 to December 4, 2014), which is referred to as the McCarthy sample dataset, or more simply the McCarthy dataset. The Pruitt random sample is approximately half of the total number of posts (471 / 950) made by the EPA under the first 16 months of Administrator Pruitt (January 20, 2017 to July 8, 2018), which is referred to as the Pruitt sample dataset, or more simply the Pruitt dataset. Therefore, the ratio in the overall population of posts is 4:1 between McCarthy and Pruitt, but 2:1 in the sample shown for analyses of the binary discursive features. Analysis of topic terms originate from the sample, but analyses of frequent topic terms are presented for the overall population of posts during the timeframe analyzed. This was done because it was easily feasible and would provide population statistics rather than only sample statistics. The hashtag analysis is also carried out on the overall population of posts for this same reason.

7.1 Distribution of Text Functions and Features Across Administrations

In this section I present results on the quantities and percentages of the various discursive functions and features of text across the two distinct administrations, which address the first research question (RQ1). Let us recall that the assessment of the features of discourse was done on a sample of posts, some of which were assessed at the level of the clause (i.e. all speech acts), and others at the level of the post (i.e. all other features). Therefore, for the speech acts, the percentages in the bottom graph add up to greater than 100% as there may be multiple speech acts in one post. However, each clause was only coded once for each speech act. Therefore, the
percentage of speech act over total number of clauses only adds up to 100%. All other features (e.g. agency; external actor; positive content; negative content; etc.) are individually assessed for each post. For each discursive function and feature I provide examples of the actual messages in which they appear. These examples provided are simply to illustrate some of the more common or iconic types of messages associated with the discursive functions and features, and not necessarily as a comprehensive or exhaustive illustration of messages.

7.1.1 Distribution of Speech Acts

Figure 2 shows the distribution of speech acts across both administrations. The categories of discourse most prevalent in both the McCarthy and Pruitt datasets were directives and representatives, in terms of percentage of posts as well as percentage of clauses. Approximately 60% of the posts in both datasets had a representative expression, and as such described a thing, event or process in the world. In terms of clauses, 44% of the clauses in the Pruitt dataset were representatives while 32% were as such in the McCarthy dataset. As previously discussed, representatives are the default categorization of speech acts, since any message may be at some level representative of something. Therefore, as part of the coding rules, a clause was only considered to be representative if it was not first considered any of the other speech acts. Often representative statements were accompanied by other speech acts, such as directives or question prompts. However, as the ultimate counts suggest, the large majority of clauses in the McCarthy dataset were either representative or directive (74% of clauses), and most of them (56%) were as such in the Pruitt dataset. Examples of these representative statements in the McCarthy dataset include:
Figure 2

*Total Counts and Percentages of Speech Acts in Each Sample Dataset*
EPA is protecting trees by prohibiting the use of 4 #neonicotinoids when plants and trees are in bloom: <link>

@GinaEPA: It’s time to start crafting the solution, not just talking about the problem of climate change #ActOnClimate

If you live near the beach, here’s important info about rising sea levels: <link>
#climatechange @NOAA

1 in 5 young people in Alaska’s indigenous communities are unemployed. We’re helping solve that. <link>

Our partnership for #Sustainable Communities with @HUDgov $ @U.S.DOT invests in Memphis & sees results: <link>

From these examples, one can notice that the category of representatives may include various types of statements relevant in the government context, including event announcements, positive self-presentation, references to government partnership, etc. The results from the study of the relationship between discursive functions and government communication purposes are presented in the next Chapter. For now, examples of messages with representatives from the Pruitt dataset include:

“EPA makes communities safer by cleaning up #Superfund sites quickly and thoroughly”
– @EPAScottPruitt <link>

Live now: @EPAScottPruitt speaking at our National Leadership Summit on PFAS in the environment: <link>

We are announcing the availability of $40 million in DERA grant funding to implement clean diesel project aimed at reducing emissions from the nation’s existing fleet of old diesel engines <link>

A new report shows how we’re achieving tangible results for vulnerable communities. <link>

In one year, we’ve made tremendous environmental progress and shown that the agency can be both pro-environment and pro-growth. <link>

*Directives* was the second mostly frequently used discursive function in both datasets, in terms of percentage of clauses as well as percentage of posts. Since directives are explicit
commands by the speaker (e.g. the government agency) to its audience, they reflect more explicitly intentions to make the audience act on a particular behavior or change their behavior, and a substantial amount of the messages under both administrations included this discursive feature. However, in terms of percentage of the total posts of each administrator, they were used about seven percentage points more in the Pruitt administration than in the McCarthy administration. It should be noted that the occurrence of directives seems to be particularly high due to the prevalence of expressions such as “learn more how…”, “check out this…”, “find out here…”, “watch…”, “Apply today…”, etc., all of which are commands in a syntactical sense, but also may refer to various topics and situations. In addition to the various instances of “learn more” and “check out”, in the McCarthy dataset directives also included:

How can we tell the #climate is changing? See the evidence for yourself: <link>

“Try taking a waste-free lunch to school today! Look for tips and sample menu ideas. <link>

“Retweet to spread the word about our Thunderclap for clean water. <link>”.

In the Pruitt dataset, examples of directives included:

Get childhood asthma under control. Eliminate asthma triggers in your home. #KidsEnvHealth

@EPAScottPruitt has a lot of new information to share in 2018. Follow him to find out more.

Teach young farmers to combat pests responsibly with integrated pest management. Apply for an #EnviroEd grant. <link>

The use of question prompts (question on Figure 2) was a relatively prevalent feature of the discourse under McCarthy, but less so in the Pruitt administration—in terms of percentages, it was used almost twice as much under the McCarthy compared to the Pruitt administration. As later examined, often these rhetorical devices were used to introduce a topic or message to the
audience and were then followed by a directive of what to do in regarding that question or topic. Recall that question prompts are identified here as questions that could be answered by or be of interest to someone, but no means are provided for the user to give an answer or comment to the question. For example, messages containing a question prompt in the McCarthy data set include:

- Want to donate food to those in need? See our food donation resources & learn more about reducing wasted food: <link>
- Want the details on our proposed Clean Power Plan? Here are the facts. <link>
- Got a short trip? #BiketoWork. Car emission controls don’t operate effectively in the first few minutes.

In some cases, the question prompt also included a representative statement in the clause itself (however, it was only coded as a question prompt; see Methodology chapter above). For example:

- Did you know that you can reduce gas vapors into the air by refueling your car in the morning? Learn more: <link>
- Did you miss @GinaEPA on @TheDailyShow talking about #EarthDay last night? Check it out here: <link>

Some examples of question prompts in the Pruitt dataset include:

- Did you know: Delaware has received approximately $375 million in EPA grants in the past decade. EPA is helping to keep the First State clean!”
- Instead of an ugly sweater party what about a green gift party? #GreenHolidayTips <link>
- Is your house prone to flooding? Check out ways to stay safe and prevent associated health problems: <link>
- Are you dealing with flooding as a result of Hurricane Harvey? Limit contact with floodwater. More info here: <link>

In the framework of this study, question prompts were considered a specific type of discursive function because of preliminary studies and familiarity with the messages being
examined here. “Questions” are considered a unique speech act—although without much agreement across speech act theorists (Fairclough, 2003). Nevertheless, as previously suggested, in the context of government communication on social media it seems useful to differentiate between two types of questions: question prompts, which seem to serve a rhetorical role, and do not indicate a method to obtain audience response or to engage in further conversation; and participatory requests, which explicitly indicate a means for audience response, further conversation or interaction. References to the opportunity for public comments were also considered as participatory requests.

In this sample of posts from both administrations, participatory requests (participatory in Figure 2) are present in a relatively small amount of posts—about 7% under the McCarthy administration, and 1% under the Pruitt administration, which is also a considerable difference among them. As previously discussed, we could hypothesize that the prevalence of this particular discursive function may be due to the ideology of the political party in power. The political left is generally more in support of expanding citizen involvement with government (Jayasuriya & Rodan, 2007; Verba et al., 1971) and therefore more likely to carry out actions that ask the public to participate in government activities. Moreover, as previously suggested, it may make more sense strategically for U.S. Democrats, compared to U.S. Republicans, to broadly engage the public (Gallup, 2015; Radcliff, 1994). In the results, we indeed observe that participatory requests via the social media was considerably more prevalent under the Democratic compared to the Republican administrator. However, of course, this is only one agency and one set of two administrators, and ultimately the difference for this specific case may be due to other factors. This is further discussed in Chapter 8.

Examples of participatory requests under the McCarthy administration include:
Let us know what you think about our draft strategic plan. The public comment period ends January 3. <link>

169 people will share tips to protect kids’ health tomorrow at 2pm. Will you lend your voice to get to 500? <link>

Have you created an app using EPA data? Tweet the link using the #EPAd ata hashtag and let us know about it.

It’s summertime and it’s important to be #SunWise. How do you protect yourself from sun overexposure? Use #EPAtips. We’ll RT

As can be observed from the examples above, many of the participatory requests in the McCarthy dataset were for actual dialogic or conversational participation on the Twitter platform itself. A considerable number of the references to participatory requests also involved references to periods for public comments (i.e. a period often available for the public to comment on a new law or regulation). In the Pruitt dataset, there were only 4 participatory requests in the sample and as such they may all be printed below:

Close out #AQAW as a #CitSci. Explore air quality in your community and share what you’ve learned: <link>

EPA and the Army are giving stakeholders 30 more days to weigh in on the proposed first step in the review of WOTUS: <link>

We are holding public hearings in West Virginia to gather comments about the proposal to repeal the clean power plan from those most impacted by the rule. #EPABack2basics <link>

BY THE NUMBERS: proposed amendments to Petroleum Refineries Sector Risk and Technology Review & New Source Performance Standards: $77M in capital investment saved $11.5M annual savings for job creators 45 days for public comment <link>
#EPAInAction <link>

In both data sets, approximately 4% of the posts included a commissive, which in this framework includes references to quality of some future outcome when in relation to an action of the agency, in addition to explicit references to what the speakers of the messages (i.e. the agency or the administrator) say they are committed to or promise to do. Commissives are thus
interesting speech acts because they may reflect distinctions in policy preferences and approaches to public administration across individual administrators, ideological positions and/or political parties. Moreover, it may be used to later assess whether or not the agency or its administrator deliver on their promises. Examples of commissives in the McCarthy dataset include:

- Our commitment to protecting tribal & indigenous communities is reinforced in our new environmental justice policy. <link>
- Our proposed rule to protect clean water won’t aggravate agriculture: we’re keeping those exemptions #ditchthemymyth <link>
- New Blog: EPA’s commitment to broad outreach and engagement in developing the Clean Power Plan. <link>
- Our Brownfields grantees will create 700+ jobs in distressed communities. <link>

In the Pruitt dataset, references to commissives include:

- The Task Force Recommendations are aimed at expediting cleanup at #Superfund sites. EPA remains dedicated to addressing risk and accelerating progress at all #Superfund sites. <link> #SuperfundTaskForce
- When administrator came to EPA he said, “I seek to listen, learn, and lead with you to address the issues we face as a nation.” And, during his first year as Administrator the Agency has achieved a long list of accomplishments: <link>
- Americans can now trust that environmental hazards will be addressed quickly and thoroughly, states and industry will be treated as partners, and regulations will provide clarity. <link>
- During the first 500 days of the @POTUS President Trump Administration, EPA proposed to repeal the so-called Clean Power Plan, a proposal that will save American jobs. <link>

Another speech act captured in this analysis was the **expressive**. Expressives, in this framework, were not necessarily only explicit evaluations, or statements with positive or negative sentiment. **Expressives** were instances that reflect sentiment in the form of statements such as “congratulations”, “thanks”, “happy holidays”, recognitions of accomplishments and
celebration (e.g. “we are celebrating...”) and cultural expressions, such as “Let’s cheer for our team”. In another study, we also referred to these types of statements or messages as “symbolic acts”, which could function as social signals to strengthen relationships, but also expression of emotions that could more or less be detached from other political or administrative practice (DePaula, Dincelli et al., 2018). References to moral sentiments, such as “honor”, “salute”, “pride”, were also considered an expressive. In the McCarthy dataset, most instances of expressives seem to be references to “congratulations” and “thanks”, including the following:

A team of 12 students diverted over 4.25 tons of food from landfills and won a #PEYA award. Congratulations! <link>

On October 7, we’ll honor our top @SmartWay Carrier Partners with Excellence Awards. <link>

We’re celebrating diversity! Matthew Tejada works on environmental justice. <link>

Congratulations to our 2014 Green Chemistry Award Winners – learn about sustainability in action. <link>

Happy Birthday AmeriCorps! Thanks for 20 years of #GettingThingsDone. #AmeriCorps20 <link>

Among others, examples of expressives from the Pruitt dataset include the following:

Congrats, SmartWay Affiliate Challenge honorees! You support our clean energy economy & make every day #EarthDay : <link>

For National Police Week, we’d like to thank the 150+ special agents in our Criminal Investigation Division working to protect the public.

This #VeteransDay, we’re proud of our employees who served, and grateful for the sacrifices all veterans have made. <link>

Merry Christmas!” <link>

Today, and every day, we proudly fly the American flag at our headquarters building in Washington, DC. Happy #FlagDay ! <link>
Expressives, like the use of question prompts and participatory requests, was a discursive feature that substantially differed across the two administrations. This difference was observed in terms of quantity, and also in terms of quality or what the expressives were about. In terms of percentage, this type of discourse category was used more than twice as much in the Pruitt administration compared to the McCarthy administration. Although we do not test these hypotheses in this study, such differences may be due to a strategy by Scott Pruitt to focus on these types of “social signals” or “symbolic acts” to counteract the high degree of skepticism in the population regarding himself as head of the EPA, as he had shown intentions to prioritize economy and job growth, rather than environmental protection as administrator of the U.S. Environmental Protection Agency (Davenport, 2017; Leber, 2017; Strassel, 2017). A similar speculation may be made for the levels of participatory requests. Given the overall public criticism of Scott Pruitt, it is not surprising that the social media page of the EPA under his administration was not so active in interacting with the public (although another strategy to counteract public criticism could be to farther engage with the public!). The expressives seem to be distinct across administrations as well, to some extent, in terms of what was being congratulated or thanked. These differences across political administrations are further discussed below under analyses of topic terms and hashtags, Section 7.4.

### 7.1.2 Distribution of Information Categories

The distribution of the categories of information representation are presented in this section. These include *actors, scientific and causal information, and statistical information*, shown in Figure 3 below. The actor most often explicitly represented in the content is the *agency* itself. Almost two thirds of the sample of messages, in both the McCarthy and Pruitt datasets, contained explicit references to the agency itself, via proper names (e.g. “EPA”) or pronouns
(e.g. “us”, “we”). The framework also considers references to agency programs and agency personnel as references to agency. It is thus the case that a majority of posts include some explicit reference to the agency itself, its program, policy or personnel. In considerably fewer instances other agencies of the government were referred to, on the graph abbreviated as govt. However, during the Pruitt administration, references to other federal government agencies was almost twice as common as in the communication under the McCarthy administration. External actors, which include state and local governments, as well as other individuals and organizations, were present in a small but not negligible percentage of posts—approximately 11% in the McCarthy administration and approximately 14% in the Pruitt administration.

References to the agency itself were too many to list. A few examples of the various actors represented in the content under the McCarthy administration included the following. The first post includes a reference to agency; the second a reference to agency and (federal) government; the third an external actor and government actor; the fourth a reference to government actor; and the last a reference to an external actor (which is considered “relatively specific”, since it refers not just to “farmers”, but “Long Island farmers” (See Appendix A for coding instructions):

1. @GinaEPA: Climate change is all about the economy #ActOnClimate

2. 94% of our employees were furloughed during the #govtshutdown. @GinaEPA was joined by @VP to welcome them back. <link>

3. #100days: We signed an agreement with @FLDEPNews and @usairforce to continue the cleanup of Tyndall Air Force Base <link>

4. Our Partnership for #Sustainable Communities with @HUDgov & @U.S.DOT invests in #Memphis & sees results: <link>

5. For Long Island farmers, fertilizer is key to saving money, reducing work, and protecting the community: <link>
From the Pruitt administration, posts that included actors are presented below. The first contains a reference to agency; the second a reference to external actor; the third and fourth references to (federal) government and external actors; and the last a reference to external actor:

1. One of our goals at EPA is to restore #Superfund to its rightful place at the core of the Agency’s mission.” - @EPAScottPruitt <link> #SuperfundTaskForce

2. Our @EPARegion8 team & @ColoradoGov toured the Bonita Peaks Superfund site and met with tribal, community, state and individual partners. <link>

3. Check out this great example of collaboration to ensure timely permitting and effective mitigation by @scdhec @USACEHQ @EPA @forestservice @nature_org @boeing and Low County Land Trust.

4. On the ground in Port Arthur, Texas w/ @USCG , @TCEQNews , and @txglo preparing to evaluate and clean up oil and hazardous material spills. <link>

5. From shrimpers, to senators, to students this EPA Gulf Guardian Award winner inspires her Gulf of Mexico community. Check out the video to learn more about her work with environmental education <link>

The rationale for capturing statistical information, and scientific and causal information, was to capture extent of more complex information as well as more reliable information in the overall messages. Information that comes from scientific activity, broadly defined, goes through more rigorous processes for determining reliability. Moreover, scientific information may generally refer to information that is more complex and difficult to capture by simple observation from an individual, and it is thus potentially more valuable and potentially more informative.
Figure 3

*Total Counts and Percentages of Occurrences of Actors, Statistics and Scientific Information*
Examples of references to scientific and causal information, as well as statistical information, some of which appear together in the same message, from the Pruitt administration are shown below. The first and second messages contain a reference to statistics; the third a reference to statistics and scientific/causal information; and the fourth a reference to scientific/causal information.

1. Did You Know: Delaware has received approximately $375 million in EPA grants in the past decade. EPA is helping to keep the First State clean!

2. From 1990 to 2014 emissions of air toxics declined by 68%. Read more here. <link>

3. Exposure to #radon indoors causes about 21,000 lung cancer deaths each year. Protect yourself: <link> #WorldLungCancerDay

4. Did you know that flooding can cause harmful mold to grow? Stop the mold! Visit: <link>

From the McCarthy administration, examples are shown below. The first and second contain a reference to statistics, the third a reference to scientific/causal information, and the last both statistics and scientific/causal information:

1. Americans toss 4 lbs. of trash per person each day, but that's the lowest it’s been since the 80s: <link>

2. 1 in 5 young people in Alaska’s indigenous communities are unemployed. We're helping solve that. <link>

3. Composting food & yard waste reduces garbage in landfills & carbon pollution. Try it for yourself and #ActOnClimate ! <link>

4. There are 10.5M missed school days a year due to asthma. Create an asthma action plan to reduce missed school days. <link>

7.1.3 Distribution of Sentiment and Self-Evaluation

The last major set of discourse categories assessed referred to categories of evaluation and sentiment that may be observed in text. Let us recall that each post was separately coded for the following: negative content, that is, whether or not any words or expressions in the post
generated some negative sentiment on the reader; and *positive content*, similarly coded as the one before. Therefore, a post may be coded as having no negative and no positive sentiment (i.e. neutral), one or the other, or both. Each post was similarly coded for *positive* and *negative self-evaluation*, which involved detecting whether or not a post presented the agency in a positive (or negative) frame. However, *no instances of negative self-evaluation were found in the dataset.*

Each post was separately coded in each of these dimensions, but by definition every *positive self-presentation* was, of course, also considered to have *positive content*. As can be observed from Figure 4 below, the large majority of posts—82% for the McCarthy administration and 87% for the Pruitt administration—were assessed to have positive content or positive sentiment. Although *negative content* was found much less often than positive content, a substantial percentage of posts contained some negative content—23% for the McCarthy administration and 28% for the Pruitt administration.

Examples of messages with positive content under the McCarthy administration, include the following. The first two messages are positive; examples three and four were coded as both positive and negative; and the fifth example was coded only as negative:

1. We’re partnering w/ @OAS & @StateDept to encourage urban sustainability innovation at the @worldurbanforum <link> #WUF7 #ECPA

2. Shower better to save 2,900 gallons of water annually and #ActOnClimate <link>

3. 2 million farmworkers grow, tend and harvest our food. One of our leaders talks about the risks of farm work: <link>

4. Are you prepared? Learn ways to reduce risks to #health and the environment due to natural #disasters . <link>

5. Household food waste is the biggest cause of methane in landfills. <link> #ActOnClimate
In the Pruitt dataset, the first two examples below are of positive sentiment; examples three and four are of both positive and negative sentiment; and the fifth example is only negative:

1. Congrats to our 2017 #FederalGreenChallenge winners: @DeptoDefense, @VAAAltoona, @VAMinneapolis, @OakRidgeOffice @ENERGY @DeptVetAffairs <link>

2. Great interview with the first-ever federal government economist to be named a fellow of the AERE: <link>

3. #DYK what to do in the event of a flood? Learn how to prepare yourself: <link>

4. Every year asthma keeps kids out of school for 10.5+ million days. Here's how to help reduce asthma at your school. <link>
5. If you’re using a generator, place it outside away from windows and doors. The exhaust is toxic and can be fatal. <link>

A substantial number of the posts under both administrations were marked as reflecting positive self-presentation or positive self-evaluation, that is, an association more or less explicit between the agency and some positive activity or outcome. In many instances, self-evaluation was explicit, as the message clearly indicated that the agency activity is having some positive outcome, either in the community, the region, the country or the globe. In other instances, the relationship was less explicit, but nevertheless associated the agency with doing something that could be generally interpreted as good. For example, such positive-self presentation messages in the McCarthy administration include:

Cleaning up a household mess isn’t easy, but we’re trying to make finding #saferproducts to do the job easier: <link>

Did you know our Brownfields program has created almost 100,000 jobs in cleanup, construction and redevelopment? <link>

We offer resources to help protect children’s health at school. <link> #ChildrensHealth

In the Pruitt administration, such messages include:

We’re leveraging all our available resources to support communities recovering from hurricane damage: <link>

This #VeteransDay, we’re proud of our employees who served, and grateful for the sacrifices all veterans have made. <link>

We’re proud to support projects in Iowa that increase efficiency, decrease pollution and protect safe drinking water systems across the state. <link>

7.2 Combinations of Text Functions and Features

During the coding analysis and examination of the content, I noticed that certain discourse features seemed to frequently happen in tandem, or not, and that it could be interesting to explore them further. Below I present an analysis of the distribution of four distinct
combinations of discursive functions/features in the messages and briefly explain why they are worth noting in the messages and discussing here. As shown in Figure 5 below, they include: the use of question prompts with directives; instances of negative content with positive content; instances of negative content without positive content; and lastly instances of only negative content that did not include a directive. Although instances-of-only-negative-content is technically not a combination of features, it was interesting to also look at this specific category, which was not included in the analyses above, to compare with the relatively large number of messages with both positive and negative content.

7.2.1 Question Prompts and Directives

The use of question prompts with directive statements was not discussed a priori as something to be expected, but it was a considerable component of the overall discourse. Although in total this combination of features was only used 11% of the time in the McCarthy administration and 8.5% in the Pruitt administration: 56% of question prompts were used with a directive in the McCarthy dataset, and 80% in the Pruitt dataset; and 28% of directives were used with a question prompt in the McCarthy dataset, and 18% in the Pruitt dataset. The role of such a combination of discursive features may be to introduce the user to a topic in some welcoming way (i.e. with a question), or to attract specific stakeholders for the message, and then proceed to suggest or command an action. Brief examples from the McCarthy dataset include:

Live along a coast? Find out about the impact of #climate change on coastal areas: <link>

Want to donate food to those in need? See our food donation resources & learn more about reducing wasted food: <link>

In the Pruitt dataset, they include:

Did you know that flooding can cause harmful mold to grow? Stop the mold! Visit: <link>
Do you live in the path of Hurricane Maria? Check out @FEMA’s website for the latest info. <link>

Figure 5

Total Counts and Percentages of Occurrences of Combination of Features

7.2.2 Negative and Positive Content

Another combination of discursive features that was recognized as interesting to explore was the presence of negative content with positive content. In the coding process it seemed that many instances of negative sentiment or negative information came with a positive counter presentation, conceivably to address the problem entailed by the negative content. As can be
calculated from the total count of instances of negative and positive content in Figure 4 above, 79% of the negative posts in the McCarthy dataset, and 84% of the negative posts in the Pruitt dataset were also coded as having positive information. This suggests that in a minority of instances only negative information was presented without any positive content. Some of the examples of messages that are coded as indicating negative and positive sentiment have already been presented (Section 7.1.3). Some other examples are below for the McCarthy dataset:

Science shows honey #bee decline due to many factors. Learn more at our pollinator protection website: <link>

Draft Federal Strategy on #BedBugs recommends prevention, management, community efforts, education, & research: <link>

We’re extending the comment period on our new measures to protect 2,000,000 farm workers from pesticide exposure. <link>

It may be worth to repeat that in our coding instructions we considered direct negations, such as “addressing the problem”, as not negative and positive. However, we also wanted to recognize the presence of negative content, even if it was somehow addressed by a positive action, but where the negative content (i.e. “pesticide exposure” in the last example above) is not directly or completely negated. The sentence still gives the sense that pesticide exposure is an existing problem and thus produces at least mild negative sentiment. Examples of posts with negative and positive information from the Pruitt dataset include:

This year we have owned up to the previous administrations mistakes and have awarded rebuilding cities such as Flint Michigan with $100 million for water infrastructure upgrades. <link>

Tiny ticks can carry big diseases. Learn how to use smart, safe, common sense techniques to protect yourself. <link>

We’re announcing that Michigan can forgive Flint’s past drinking water debt: <link>
### 7.2.3 Negative and Not Positive

Given the large number of instances where negative sentiment was associated with positive sentiment, the question also arises regarding the structure of messages that only contained negative content, but with no positive information in the same message or post. Humans are known to respond differently to negative and positive information (Ito et al., 1998; Siegrist & Cvetkovich, 2001), and the results suggest that positive information is considerably more common than negative information. However, for many messages, it may make sense that only negative information is or should be provided. It may be useful to provide negative information in order to properly discuss health and environmental dangers (Siegrist & Cvetkovich, 2001). Examples of the use of negative information without positive content in the McCarthy dataset include:

You take between 17,000 and 23,000 breaths each day. That could be a lot of pollution: <link>

There are currently no national limits on #carbon pollution from power plants. <link>”

The global average temperature increased by more than 1.4°F over the last century. <link>

In the Pruitt dataset, examples include:

Elevated radon levels are found in all homes: old, new, basement, or no basement. Test your home: <link>

If you’re using a generator, place it outside away from windows and doors. The exhaust is toxic and can be fatal. <link>

If your well was flooded during Hurricane #Harvey2017 don't drink or wash with the water until it’s been tested. <link>

As the examples above may indicate, it was sometimes difficult to classify a post as reflecting negative or positive sentiment. For example, for some people the message “the global average temperature increased by more than…” may be neutral information, negative
information or potentially positive information. It is probably for this reason that inter-rater agreement levels for the sentiment dimensions were not high. Nevertheless, although some themes are often discussed as belonging to a specific political ideology (e.g. environmental pollution as a theme of the left; economic growth as a theme of the right), the coding framework assumes that there exists broad agreement that notions such as “pollution” or “floods” are generally negative, and “growth” (unless preceded by a negative term) and “learning more” are generally positive.

7.2.4 Only Negative and Not Directive

As shown in Figure 5 above, instances of negative information that did not include positive content were used roughly the same amount in each administration, at approximately 5% and 4% of total posts. However, in the Pruitt dataset many of these instances of only negative information came with a directive, generally as an instruction to potentially address that negative information. Only 1% of the posts made under Pruitt had negative information without positive content or without a directive. Examples from the Pruitt dataset of such instances of purely negative information are listed below:

Poisoning is a big deal! It is the second leading cause of death from injuries in the U.S. behind only motor vehicle crashes.

#Wildfire smoke near you? People w/heart or lung disease, kids w/asthma, and older adults are especially vulnerable. <link>

Under the McCarthy administration, posts that were purely negative (without a directive and without positive content) account for 4% of the posts, compared to the 1% of posts made under the Pruitt administration. This shows that posts made by the agency under the McCarthy administration were more likely to contain purely negative messages without a directive, which often serve to address the issue (e.g.: “Viruses are a big deal. Get vaccinated!”) but may not
contain a more explicit reference to a positive term. This indicates that the agency under McCarthy was more willing to share more purely negative messages. Examples of these types of messages from the McCarthy dataset are provided above; others include:

- What’s that running in the kitchen? Have you seen mice or unwanted creatures invading your home lately? [link]

- Household food waste is the biggest cause of methane in landfills. [link]

- 60% of streams and wetlands lack clear protection under the Clean Water Act and 1 in 3 Americans get drinking water from a source at risk.

This analysis of combination of discursive functions and features show that a number of these elements appear together relatively frequently, potentially to strength the appeal of the message, such as in the use of question prompts with directives, and to potentially to make the reader interested on a topic. Directives and positive content were often included in messages with negative content, which provided a means or explanation of how the negative issue could be addressed. However, there were some differences across the two administrations on how this discourse was carried out. Considerations for explanations on the causes and implications of these types of discursive strategies are provided later in the Discussion Chapter.

### 7.3 Associations Between Speech Acts and Government Goals

In this section I present the results from the analysis of the relationship between speech acts and the distinct government communication goals or purposes, raised in RQ2. The analysis was based on a selection of a random sample of messages that contained each of the distinct speech act (n = 30 for each of the six speech acts), and a classification of these messages as one or more of the government communication purposes defined in Section 6.9. The intension was to understand how this component of language, the speech acts, have some association with specific goals of government communication. This could show us the extent to which various
government communication purposes are pursuit through these explicit aspects of language. In the tables below, the reddish/light color categories are considered *agency-centered*, and the blueish/dark color categories are considered *citizen-centered*, as discussed in Chapter 2. The percentages add up to greater than 100% since each message could be classified in more than one goal category. Given time and resource constraints, the analysis here is done for the speech functions only, and not for all text features, although this could be useful in future research.

In Table 9 below we observe that *directives* are associated with most government communication goals. Like all other speech acts, except *representatives*, no association between directives and *blame avoidance* or *counter-act media* were found. Directives were associated with all other communication purposes analyzed; only one message was found related to crisis communication (3.3%). This is somewhat surprising, since directives may be expected to be present in messages of crisis communication, to order or command individuals to certain actions. However, the interpretation here should probably be that most directives are not crisis communication—although most crisis communication may include directives, which was not the direction of this analysis. Moreover, we observe that messages with directives were often categorized as *moral suasion* (40%). Directives were also more commonly associated with *positive self-presentation* (36.7%), which is probably due to the prevalence of positive self-presentation throughout the discourse. Directives were also associated with *information provision* (26.7%) and *news/notifications* (16.7%). Examples of the messages in each category are provided in Table 9 below.
Table 9

Association of Directives with Goals of Government Communication

<table>
<thead>
<tr>
<th>Directives</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy promotion</strong></td>
<td></td>
</tr>
<tr>
<td>“Know the Facts: Our proposed rule to protect clean water actually decreases regulations on ditches #ditchthemyth”</td>
<td>23.3</td>
</tr>
<tr>
<td><strong>Positive self-presentation</strong></td>
<td></td>
</tr>
<tr>
<td>“Teachers: Promote our Clean School Bus Campaign &amp; protect kids, your school, &amp; our environment. &lt;link&gt; #ChildrensHealthMonth”</td>
<td>36.7</td>
</tr>
<tr>
<td><strong>Networking (Internal)</strong></td>
<td></td>
</tr>
<tr>
<td>“Check out how we’re working with @NASA and @NOAA to research air quality from space. &lt;link&gt; #DISCOVERAQ”</td>
<td>10</td>
</tr>
<tr>
<td><strong>Information provision</strong></td>
<td></td>
</tr>
<tr>
<td>“There are 10.5M missed school days a year due to asthma. Create an asthma action plan to reduce missed school days. &lt;link&gt;”</td>
<td>26.7</td>
</tr>
<tr>
<td><strong>News/Notification</strong></td>
<td></td>
</tr>
<tr>
<td>“Tune in to @OfficialRFDTV #CattlemenToCattlemen @8:30pm ET tonight to hear &lt;administrator&gt; talk about his plans to work w/cattle producers.”</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>Crisis communication</strong></td>
<td></td>
</tr>
<tr>
<td>“If you’re under a #tornado WARNING, seek shelter immediately! More tips about what to do before &amp; after a tornado: &lt;link&gt;”</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Moral suasion/exhortation</strong></td>
<td></td>
</tr>
<tr>
<td>“Shower better to save 2,900 gallons of water annually and #ActOnClimate. &lt;link&gt;”</td>
<td>40</td>
</tr>
<tr>
<td><strong>Networking (external)</strong></td>
<td></td>
</tr>
<tr>
<td>“Kudos to Atlanta, winner of our 2013 Smart Growth award! Read the blog post by @KeyesFlem”</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>Dialogue/Participation</strong></td>
<td></td>
</tr>
<tr>
<td>“Send us your feedback! We’re accepting comments on our proposed Clean Power Plan: &lt;link&gt;”</td>
<td>6.7</td>
</tr>
</tbody>
</table>
Table 10

Association of Question Prompts with Goals of Government Communication

<table>
<thead>
<tr>
<th>Question Prompts</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy promotion</strong></td>
<td>30</td>
</tr>
<tr>
<td>“Did you know that you can #ActOnClimate by driving a #SmartWay certified vehicle? &lt;link&gt;”</td>
<td></td>
</tr>
<tr>
<td><strong>Positive self-presentation</strong></td>
<td>23.3</td>
</tr>
<tr>
<td>“Did you know for every $1 our Brownfields Program invests in grants, communities benefit by more than $17.50? &lt;link&gt;”</td>
<td></td>
</tr>
<tr>
<td><strong>Networking (Internal)</strong></td>
<td>3.3</td>
</tr>
<tr>
<td>“Energy is all around us. Do you know where? Find out more with @Energy ’s animated video. &lt;link&gt; #ActOnClimate”</td>
<td></td>
</tr>
<tr>
<td><strong>Information provision</strong></td>
<td>43.3</td>
</tr>
<tr>
<td>“Got a short trip? #BiketoWork. Car emission controls don’t operate effectively in the first few minutes.”</td>
<td></td>
</tr>
<tr>
<td><strong>Crisis communication</strong></td>
<td>6.7</td>
</tr>
<tr>
<td>“In a flood zone? Make sure you know how to properly disinfect your drinking water. &lt;link&gt;”</td>
<td></td>
</tr>
<tr>
<td><strong>Moral suasion/exhortation</strong></td>
<td>40</td>
</tr>
<tr>
<td>“Food for thought: Instead of a New Year’s Resolution, how about a New School Year’s Resolution? Reduce wasted food &amp; #feedpeoplenotlandfills”</td>
<td></td>
</tr>
<tr>
<td><strong>Networking (external)</strong></td>
<td>3.3</td>
</tr>
<tr>
<td>“What do you do to protect the environment every day? Join the @EnergyStar and @NEEFUSA #TakeASec challenge.”</td>
<td></td>
</tr>
</tbody>
</table>

Table 10 above provides the associations between question prompts and government communication goals. Similarly, to the analysis of directives above, question prompts were associated with almost all of the government communication purposes, to a lesser or greater extent. Perhaps surprisingly, crisis communication (6.7%) was associated with question prompts more often than with directives, but by a small margin. Similarly with directives, we see question prompts often associated with moral suasion (40%). Also, question prompts are frequently associated with information provision (43.3%), but this category in this study is relatively broad.
Question prompts were also commonly associated with policy promotion (30%) and positive self-presentation (23.3%), which, once again, may be as such partly due to the prevalence of these types of messages in the overall discourse. Question Prompts, in this sample, were not found associated with news/notifications nor with dialogue/participation.

Table 11

Association of Participatory Requests with Goals of Government Communication

<table>
<thead>
<tr>
<th>Participatory Requests</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy promotion</strong></td>
<td></td>
</tr>
<tr>
<td>“We’re extending the comment period on our new measures to protect 2,000,000 farm workers from pesticide exposure. &lt;link&gt;”</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Positive self-presentation</strong></td>
<td></td>
</tr>
<tr>
<td>“We’re extending the comment period on our new measures to protect 2,000,000 farm workers from pesticide exposure. &lt;link&gt;”</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>Networking (Internal)</strong></td>
<td></td>
</tr>
<tr>
<td>“Join &lt;administrator&gt; and @Energy Secretary Moniz for #WHClimateChat Google+ Hangout: Monday, May 19 at 1:00 pm EDT. &lt;link&gt;”</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>Information provision</strong></td>
<td></td>
</tr>
<tr>
<td>“Poor air quality can aggravate respiratory problems like #asthma . How do you help protect the air in your community? Tweet with #EPAtips”</td>
<td>10</td>
</tr>
<tr>
<td><strong>News/Notification</strong></td>
<td></td>
</tr>
<tr>
<td>“Our draft Report on the Environment covers environmental, health trends. Take a look and share your comments at &lt;link&gt;”</td>
<td>26.7</td>
</tr>
<tr>
<td><strong>Moral suasion/exhortation</strong></td>
<td></td>
</tr>
<tr>
<td>“We hope your summer is going swimmingly! As you head to the pool and beach, tell us what you do to reduce #water pollution using #EPAtips”</td>
<td>20</td>
</tr>
<tr>
<td><strong>Networking (external)</strong></td>
<td></td>
</tr>
<tr>
<td>“Discuss climate change &amp; the health of Latino communities with &lt;administrator&gt; &amp; @Voces_Verdes on today.”</td>
<td>13.3</td>
</tr>
<tr>
<td><strong>Dialogue/Participation</strong></td>
<td></td>
</tr>
<tr>
<td>Our Clean Power Plan comment period has been extended through Dec 1. Submit an official comment here: &lt;link&gt;</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 11 above shows the associations between participatory requests and government communication purposes. Participatory requests were associated with a number of government communication goals, however, most of these—e.g. policy promotion (3.3%), positive self-
presentation (6.7%), and information provision (10%)—were lower than for other speech acts. Although messages of networking (internal) were few (6.7%), combined with networking (external) (13.3%) the comprised 20% of all messages. We could have expected more explicit networking associated with participatory requests, but the level is about 20% of messages in the sample. Participatory requests had a strong association with moral suasion (20%), as well as with news/notification (26.7%). Ultimately, participatory requests had a special association with dialogue/participation because their definitions virtually overlapped. Therefore, 100% of the post coded as participatory requests were also considered as references to government-citizen dialogue and/or participation.

Table 12

Association of Commissives with Goals of Government Communication

<table>
<thead>
<tr>
<th>Commissives</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy promotion</td>
<td></td>
</tr>
<tr>
<td>“Our proposed Clean Power Plan will #ActOnClimate and protect the health of future generations. &lt;link&gt;”</td>
<td>46.7</td>
</tr>
<tr>
<td>Positive self-presentation</td>
<td></td>
</tr>
<tr>
<td>“Our grant will help identify, conserve, and protect the significant resources within @APSounds &lt;link&gt;”</td>
<td>100</td>
</tr>
<tr>
<td>Networking (Internal)</td>
<td></td>
</tr>
<tr>
<td>“During the first 500 days of the @POTUS President &lt;president&gt; Administration, EPA proposed to repeal the so called Clean Power Plan”, a proposal that will save American jobs. &lt;link&gt;”</td>
<td>3.3</td>
</tr>
<tr>
<td>Information provision</td>
<td></td>
</tr>
<tr>
<td>“#Cleandiesel funds are going to 141 school bus fleets in 32 states to retrofit buses that will reduce pollutants linked to heart disease and asthma. &lt;link&gt;”</td>
<td>16.7</td>
</tr>
<tr>
<td>News/Notification</td>
<td></td>
</tr>
<tr>
<td>“New Blog: EPA’s commitment to broad outreach and engagement in developing the Clean Power Plan. &lt;link&gt;”</td>
<td>6.7</td>
</tr>
<tr>
<td>Networking (External)</td>
<td></td>
</tr>
<tr>
<td>“Our Brownfields grantees will create 700+ jobs in distressed communities. &lt;link&gt;”</td>
<td>3.3</td>
</tr>
</tbody>
</table>
Table 12 above shows the associations between *commissives* and government communication purposes. Commitments were associated with the least number of goals of government communication. Messages with commitments, from the sample analyzed, were not found associated with messages of *crisis communication, moral suasion,* or *dialogue/participation.* Of course, this is not to suggest that such a combination of language and purpose could not be achieved, but it was simply not found in this context. The communication purposes were more evenly divided between agency-centered and citizen-centered. It may not be surprising that most commissives were associated with positive self-presentation, since this was a prevalent text feature and included any positive framing of an agency’s actions or programs. However, in this sample analyzed, commissives were all considered a form of positive self-presentation (100%), and 46.7% of the messages a form of policy promotion. In some instances, commissives included specific information about policies or actions already taken. Let us recall that the definition of commissives also includes statements about future outcomes of certain policies or actions. Therefore, all predictions about what the future outcome of some agency policy or program is considered in this study a commissive (see Appendix A). Although commissives could conceivably have been often found together with networking, either internal or external, this was not the case.

Table 13 shows the relationship between *expressives* and distinct goals of government communication. One of the few goals not associated with expressives was *crisis communication.* This may be explained due to definition of those as references to immediate danger, and not to a topic may refers to a crisis. Given the unique nature of some of the “phatic expressions”, some messages were only considered as such (13.3%) and not under a government communication purpose. These messages could be interpreted as a type of positive self-presentation. However, I
kept the count separate, so the reader could judge on her own. Nevertheless, expressives were most associated with positive self-presentation, and also to a substantial extent to networking, internal (23.3%) and external (30%), which is not particularly surprising since expressives, as a speech act, are often made toward others.

Table 13

Association of Expressives with Goals of Government Communication

<table>
<thead>
<tr>
<th>Expressives</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy promotion</strong></td>
<td></td>
</tr>
<tr>
<td>“Check out how we’re celebrating the 2nd anniversary of the Lautenberg Chemical Safety Act. &lt;link&gt;”</td>
<td>13.3</td>
</tr>
<tr>
<td><strong>Positive self-presentation</strong></td>
<td></td>
</tr>
<tr>
<td>“We’re celebrating &lt;administrator&gt; ’s first #100days by tweeting highlights throughout the week of @EPA achievements. &lt;link&gt;”</td>
<td>46.7</td>
</tr>
<tr>
<td><strong>Networking (Internal)</strong></td>
<td></td>
</tr>
<tr>
<td>“Celebrating diversity: meet Enid Chiu, environmental engineer for Region 3’s Water Protection Division &lt;link&gt; #EPAers”</td>
<td>23.3</td>
</tr>
<tr>
<td><strong>Information provision</strong></td>
<td></td>
</tr>
<tr>
<td>“94% of our employees were furloughed during the #govtshutdown &lt;administrator&gt; was joined by @VP to welcome them back”</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>News/Notification</strong></td>
<td></td>
</tr>
<tr>
<td>“Today at WH Solar Summit we honor #WHChamps driving solar deployment watch live today 9-3pm: &lt;link&gt;”</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>Moral persuasion/exhortation</strong></td>
<td></td>
</tr>
<tr>
<td>“Happy #Earth Day. Today, spread the word about the climate challenge we face to #ActOnClimate &lt;link&gt;”</td>
<td>10</td>
</tr>
<tr>
<td><strong>Networking (external)</strong></td>
<td></td>
</tr>
<tr>
<td>“Way to go @UFlorida &amp; @KState ! Their green infrastructure designs won 1st place in our Campus RainWorks Challenge. &lt;link&gt;”</td>
<td>30</td>
</tr>
<tr>
<td><strong>Dialogue/Participation</strong></td>
<td></td>
</tr>
<tr>
<td>“We hope your summer is going swimmingly! As you head to the pool and beach, tell us what you do to reduce #water pollution using #EPAtips”</td>
<td>6.7</td>
</tr>
<tr>
<td>*Expressives only:</td>
<td></td>
</tr>
<tr>
<td>“Happy Hanukkah!”; “Happy Kwanzaa!”</td>
<td>13.3</td>
</tr>
</tbody>
</table>
### Table 14

**Association of Representatives with Goals of Government Communication**

<table>
<thead>
<tr>
<th>Representatives</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blame avoidance</strong></td>
<td>3.3</td>
</tr>
<tr>
<td>“This year we have owned up to the previous administrations mistakes and have awarded rebuilding cities such as Flint Michigan with $100 million for water infrastructure upgrades. &lt;link&gt;”</td>
<td></td>
</tr>
<tr>
<td><strong>Counter-act media</strong></td>
<td>3.3</td>
</tr>
<tr>
<td>“FPS reports that the gunshots at EPA's Headquarters were unfounded, there were no injuries and the building is secure.”</td>
<td></td>
</tr>
<tr>
<td><strong>Policy promotion</strong></td>
<td>10</td>
</tr>
<tr>
<td>“To #ActOnClimate we need to cut #carbon pollution. Here are 4 facts about our proposed Clean Power Plan: &lt;link&gt;”</td>
<td></td>
</tr>
<tr>
<td><strong>Positive self-presentation</strong></td>
<td>46.7</td>
</tr>
<tr>
<td>“War on Lead: EPA Enforcement Actions Help Protect Vulnerable Communities Across the Country from Lead-Based Paint Health Hazards: &lt;link&gt;”</td>
<td></td>
</tr>
<tr>
<td><strong>Networking (Internal)</strong></td>
<td>6.7</td>
</tr>
<tr>
<td>“We’re partnering w/ @OAS &amp; @StateDept to encourage urban sustainability innovation at the @worldurbanforum &lt;link&gt; #WUF7 #ECPA”</td>
<td></td>
</tr>
<tr>
<td><strong>Information provision</strong></td>
<td>40</td>
</tr>
<tr>
<td>“Tex Gómez is the chair of our Hispanic Employment Program Council. &lt;link&gt;”</td>
<td></td>
</tr>
<tr>
<td><strong>News/Notification</strong></td>
<td>16.7</td>
</tr>
<tr>
<td>“We’re testing samples to identify &amp; categorize materials drawn from recovered containers displaced by #Harvey in Aransas Pass TX on 9/10/17. &lt;link&gt;”</td>
<td></td>
</tr>
<tr>
<td><strong>Moral suasion/exhortation</strong></td>
<td>23.3</td>
</tr>
<tr>
<td>“Little bodies, big effects: kids are hit harder by toxins, the sun, etc. than adults. Learn how to protect yours.: &lt;link&gt;”</td>
<td></td>
</tr>
<tr>
<td><strong>Networking (external)</strong></td>
<td>6.7</td>
</tr>
<tr>
<td>“Deputy Administrator Perciasepe is getting ready to throw the first pitch for the @Nationals #EarthDay #ActOnClimate &lt;link&gt;”</td>
<td></td>
</tr>
<tr>
<td><strong>Dialogue/Participation</strong></td>
<td>6.7</td>
</tr>
<tr>
<td>“Our draft Report on the Environment covers environmental, health trends. Take a look and share your comments at &lt;link&gt;”</td>
<td></td>
</tr>
</tbody>
</table>
Table 14 shows the associations between representatives and government communication purposes. Representatives were associated with all of the government communication purposes. It was the only speech act that had an example of what may be considered a type of blame avoidance and an instance of counter-act media. The example of blame-avoidance is not an explicit or direct reference of the agency or its personnel abstaining responsibility, but it is a reference to putting blame of some negative action onto another agent, namely the previous administration. The message included as counter-act media in Table 14 was not so much a statement to refute or argue against some negative media reporting, but more simply a message indicating that claims of gunshots at the EPA were unfounded. Nevertheless, it was the closest statement found related to a notion of refuting ongoing media reports. This speech act, not surprisingly, was also associated with every other government communication purpose, but in every other case this included positive self-presentation (46%). Many of these messages could be considered information provision, and these speech acts were also seen with messages considered policy promotion (10%) and moral suasion (23.3%).

7.4 Implications of Political Change on Government Discourse

Section 7.2 above showed and illustrated differences in various speech functions and text features across the distinct political administrations, mostly based on a quantitative assessment of their use and observation of various messages containing the various discursive functions and features. To address more specifically a causal link between the political parties, ideologies and the appointed administrators in office and the discourse of the agency on the social media platform, I present below an analysis of changes in *topic terms* and *hashtags* and discuss how these topic terms and hashtags are (or are not) reflective of the policy preferences, parties and ideologies of the distinct administrators and administrations in office.
7.4.1 Frequent Topic terms

As part of the coding task, coders identified 3 to 5 topic terms that could be used to summarize the main topic or theme of each message. As in other topic modeling analyses, nouns were prioritized, but adjectives and verbs were also allowed to be included as part of the topic terms for a message, since they can better illustrate and contextualize the topic (Boyd-Graber, Mimno, & Newman, 2014). Moreover, combinations of two terms, proper nouns as well as hashtags (when used as part of a sentence), were captured as potential topic terms. As such, the topic terms identified various policies, programs and issues discussed in the messages. The reliability of identifying these topic terms was discussed in Section 7.1. Here I present results from the calculation of the amount of times the most popular topic terms, identified in the sample coding task, were used in the overall population of posts. Figure 6 below presents the so-called “clean list” of the 35 most frequent topic terms under McCarthy (for the 16-month period analyzed). Similarly, Figure 7 below presents the clean list of the 35 most frequent topic terms under Pruitt.

To recall, given the presence of various highly generic topic terms identified (e.g. “learn”, “job”, “health”), I produced a “clean list” of the 35 most frequent topic terms by eliminating certain terms that mostly appeared in both administrations and are relatively generic. Some generic terms are still present in this clean list, given their potential uniqueness in each dataset (e.g. “reduce”, “emission”, “food”, etc). While I understand this may be controversial and subjective, the idea was to remove terms that were both generic and present in both datasets. This then created a list of topic terms that is more distinct of each administration. Moreover, the full list of frequent terms removed to produce this clean list is provided in Appendix B.
One can observe a recurrent theme in the most frequent topic terms in the McCarthy dataset. As shown in Figure 6 above, the top ten most frequent topic terms include “climate” and “actonclimate”, the second of which was also a hashtag. Besides “climate” and “ActOnclimate”, the frequent topic terms include “green”, “energy”, “climate change”, “pollution”, and “clean power plan”. We can thus say that much of the content of messages of the EPA under the McCarthy administration referred to policies and activities to address climate change. As previously discussed, these were some of the major policies developed by the Obama administration. Moreover, other terms or concepts often used in the messages include “clean water”, “food”, “air-quality”, “emission”, “science”, “carbon pollution”, “chemical”, “pesticide”, and “thunderclap”. As previously discussed, the focus and attention to addressing climate change, carbon pollution, chemicals in air and water, and pesticide use have been mostly
associated in the U.S. with the left and the U.S. Democratic party (Antonio & Brulle, 2011; Dunlap & McCright, 2008).

On the other hand, the most popular topic terms, from the clean list, under the Pruitt administration, as shown in Figure 7 below, referred to “hurricane”, “fund”, “irma”, “air”, “lead” (which could refer to leading as a verb or lead as a chemical), “infrastructure”, “action”, “flood”, “American”, “superfund” and others. There is perhaps less of a clear general theme or set of themes in the Pruitt dataset, except for references to hurricanes. However, it is clear that there are great distinctions across both datasets.

**Figure 7**

*Instances of Appearances of Most Frequent Topic Terms Under Pruitt*

The choice and extent of topic terms that appear in the messages can be explained in part based on time specific events and the external environment, such as Hurricane Maria and Hurricane Harvey that happened under the Pruitt administration. Remarkably, there were no
major hurricanes in 2013 and 2014, under the McCarthy administration, comparable to those in 2017 (NOAA, 2017). However, the comparison of topic terms does also seem to signal that the McCarthy administration was much more active around a specific theme, namely climate change and the Clean Power Plan. This shows how the EPA under the McCarthy administration was focused on promoting the issue of climate change and particular policies to address them. The most frequent topic terms, in the top of the list, under the Pruitt administration, are more focused on the hurricanes mentioned. Nevertheless, it is clear that “climate change” is not among any of the topics under the Pruitt administration. Moreover, we observe different terms gaining prominence, in relative terms, in the discourse of the agency under Pruitt, including a higher focus on the terms “American”, “superfund” and “WIFIA”. Despite the fact that the discourse continues to focus on environmental issues across the administrations, there are clear changes of priority as a consequence of change in administration and these are to at least some degree due to party, ideology and/or distinct policy preferences.

7.4.2 Evaluation of Topic Terms

To better understand how distinct topic terms were expressed and evaluated in the messages of the agency under each administrator, and thus understand the influence of the party, ideologies and/or policy objectives of each administration on the messages, I selected a few topic terms that were pronounced under each administration for further examination. I combined these topic terms in three sections, as explained above in Chapter 6: Clean Power Plan, climate change and Superfund; Hurricane, flood, and water; and Business, progress and American. The reasons for selecting these topic terms was to highlight any differences that ideologies and policy objectives could have made in the messages, since these terms relate to ideals of nationalism, environmental regulation and the economy. This selection is further explained in Chapter 6. For
each of these topic terms I retrieved the messages that included these terms and examined how they were used under both the McCarthy and Pruitt administrations. Below I discuss how these topics and issues were expressed and evaluated in the messages. This overall analysis gives an illustration of both some consistency as well as differences in how the discourse of the agency was influenced by the administration in power.

7.4.2.1 Clean Power Plan, Climate Change and Superfund.

As previously discussed, the Clean Power Plan, a frequent term found in the messages of the EPA under the McCarthy administration, was one of the major climate change policies of the Obama administration. The messages referring to this term were in general in support of the Clean Power Plan and in support of action on climate change. Some of these messages provided vague speculations about the future effects of the plan; some provided more precise predictions. Often references to the Plan, under the McCarthy administration, included references to “facts” and “reasons” for the benefits of the Plan. We also found participatory requests associated with the topic. In aggregate, given their plurality, the posts for the Clean Power Plan may also be considered an active promotion of the policy. Examples of them include:

Our proposed Clean Power Plan will #ActOnClimate and protect the health of future generations. <link>

Our proposed Clean Power Plan will cut carbon pollution from power plants by 30% by 2030. #ActOnClimate <link>

Our proposed Clean Power Plan: just the facts. <link> #ActOnClimate

Send us your feedback! We’re accepting comments on our proposed Clean Power Plan: <link>

References to climate change are also numerous under the McCarthy administration and included general and scientific assessments about the problems associated with climate change;
messages to excite individuals; and references to how existing programs of the agency address climate change. Some of the examples are below:

#Climate change is fueled by #carbon pollution from human activities. <link>
#ActOnClimate

“We have the knowhow, the skill, and the ingenuity we need to take on climate change.”
- @GinaEPA #ActOnClimate

Grocery stores that reduce food waste w/ our Food Recovery Challenge save money & fight climate change. <link> #ActOnClimate

In contrast, the term climate change only appears once in the overall population of EPA Twitter posts under the Pruitt administration. The following is the post:

U.S. rests climate change discussion at G7, joins other nations reaching consensus on important environmental issues: <link>

The explicit reference to stopping climate change discussion at G7, and the lack of other references to climate change reflect President Trump’s as well as Administrator Pruitt’s relatively public lack of concern for the issue of climate change (Milman, 2018; Worland, 2018). In regard to the Clean Power Plan, a few references are made under the Pruitt administration—a total of 11 posts from the overall total posts of 950. However, these are mostly announcements regarding the “review” and “repeal” of the Plan, which clearly indicated the administration’s disapproval toward the policy. Some of these messages also referred to “participatory requests” but for public comments on the “review” of the Plan. Some of these posts under the Pruitt administration include:

@POTUS is at EPA today to announce an executive order directing us to review the Clean Power Plan. Watch it live: <link>

Thanks to the DC Circuit’s decision today, we'll be able to proceed with @POTUS’s executive order and review the Clean Power Plan.

@EPAScottPruitt signed a proposal to repeal the Clean Power Plan per the Executive Order on Energy Independence. <link>
We’re holding public hearings in West Virginia to gather comments about the proposal to repeal the Clean Power Plan from those most impacted by the rule. #EPAback2basics

In contrast, the top policy priority of the Pruitt administration, as mentioned on Twitter and other media (Dennis, 2017; Ebbs, 2018), refers to superfund—a federal government program to fund and clean polluted sites from industrial activity to be restored to safe conditions. The term superfund was used in 38 posts under the Pruitt administration (4% of total posts), and in 25 under the McCarthy administration (0.6%), which made it a substantially more prevalent policy/issue discussed under Pruitt compared to the agency under McCarthy. However, the language surrounding this issue/policy is not on how to add more regulations to stop industry from creating polluted sites, but to portray the program as doing well and already being “aggressive” to improve the environment. Examples of references to superfund under the Pruitt administration include:

Read about how we are taking aggressive action to protect human health near the West Lake Landfill Superfund site. <link>

Fact check TRUE: In 2017 EPA delisted over 3X as many Superfund sites as it did in 2016. That’s progress for the American people. <link>

Check out @abcnews article about #EPA prioritizing some of the most contaminated Superfund sites for aggressive clean up so they can get redeveloped and reused. <link>

In this analysis, we thus see a change in the discourse of the agency that may be attributed to the change in political leadership, and which also correspond to the policy objectives of the administrators. President Obama and Administrator McCarthy developed, supported and promoted the Clean Power Plan and the EPA communicated extensively about it on Twitter. The issue of climate change was also extensively communicated about by the EPA during the McCarthy administration. As previously discussed, the U.S. Democratic party and
social liberal ideology has been in support of strong environmental regulations and being aggressive to address climate change (Dunlap & McCright, 2008). Contrastingly, the agency changed considerably its discourse around climate change and the Clean Power Plan during the Trump and Pruitt administration. All discussion on climate change stopped, and a review to of the Clean Power Plan, to repeal it, was put in place. As previously noted, this lack of concern for addressing climate change has been characteristic of the U.S. Republican party and American conservative ideology at least since the latter part of the 20th century (Antonio & Brulle, 2011; Dunlap & McCright, 2008). It is unclear why the focus on the Pruitt administration on the issue and policies of superfund sites. Nevertheless, the discussion surrounding it was not to increase and support the program, but to acknowledge that it is already doing something good and therefore industry may not need further regulation to stop the issue. We thus see a relation between policy objectives, ideologies and political parties in the communication.

7.4.2.2 Hurricanes, Flood and Water

The most frequent terms under the Pruitt administration referred to hurricanes, in particular: Hurricanes Irma, Maria and Harvey, as well as related information concerning flooding and drinking water, as can be observed from Figure 7 above. Hurricanes and flooding are not in themselves particularly controversial; most of the time most people do not want to have them. Nevertheless, we see a major difference in the extent to which this term is used across administrations. The term hurricane was only in 7 posts under McCarthy (0.1% of posts), whereas it was used in 114 posts under Pruitt (12% of posts).

One obvious explanation for this difference is the number of major hurricanes that occurred in the 2017 Atlantic hurricane season (i.e. Harvey, Irma and Maria), compared to the 2013 and 2014 season. There were no “major hurricanes” in 2013, and 2 major hurricanes in
2014 (Landsea, 2018), which correspond to the McCarthy administration and time period analyzed. However, the 2014 Atlantic hurricane season was “somewhat below average” (Pasch, 2015), whereas the 2017 Atlantic hurricane season was “extremely active” (NOAA, 2017). Therefore, it would not be reasonable to assume that the prevalence of references to hurricanes would be similar across these two administrations. Moreover, this is a topic concerning the mission of the EPA and it is within its jurisdiction and prerogative to discuss it. Reference to hurricanes is therefore not considered here as an effect of change in political administration.

Nevertheless, to examine how these messages were expressed, in the EPA posts under Pruitt, most references to hurricane included directives and information about how to protect from them and their effects (e.g. flooding, drinking water) as well to indicate that the agency is “working on it”. Examples include:

Keep 3 gallons of water per person in your home emergency kit and change it every few months. Visit our page for more info on preparing for a hurricane. <link> #HurricanePrep

We’re hard at work helping clean up from Hurricane Irma by collecting waste and assessing water supplies/treatment: <link>

There are many ways to help those affected by the flooding after Hurricane Harvey – how you can contribute: <link>

*Floods* and *flooding*, a related but also distinct topic to *hurricanes*, was present in 48 posts of the Pruitt administration (5%), and in 63 of the McCarthy administration (1.6%). In the Pruitt dataset, many of these posts were related to the aforementioned hurricanes, although some provided basic information regarding flooding more broadly. Under the McCarthy administration, references to floods were made to generally inform people about flood zones, make the association between floods and climate change, and also as part of the “ditchthemyth” campaign—the effort by the EPA to “provide information”, regarding the 2014 and 2015 “Waters of the United States” (WOTUS) rulemaking or “clean water proposal” (Lipton & Shear,
As such, the issue of flood was related to the issue of “water” in the EPA messages under the McCarthy administration as well as the administration’s proposal concerning its proposed WOTUS rules—one of the policies promoted by the EPA for which it ran into legal trouble (GAO, 2015). For example, posts from the McCarthy dataset concerning floods include:

- Avoid contact with water during a #flood. Learn why & see more tips about what to do before, during, & after #floods. <link>
- Our proposed rule to protect clean water does NOT regulate floodplains. Plain and simple. #ditchthemyth <link>
- #USwaters: Proposed clean water rule benefits include flood mitigation, less pollution & more wildlife habitat. <link>

As one of the most important elements for life and environmental protection, water was a prominent topic in the EPA Twitter messages across both administrations. In addition to messages about safe drinking water, especially in relation to floods, many of the messages under the Pruitt administration concerning water referred to the Water Infrastructure Finance and Innovation Act (WIFIA). These posts generally provided information about the program, and its potential benefits. Interestingly, this was an act signed by President Obama on June 10, 2014. However, there are no references to it under the McCarthy administration (during the period analyzed, which covered up to December 4, 2014). WIFIA was thus a policy supported and promoted under the Trump and Pruitt administration, but not given emphasis in the Twitter discourse of the agency under Obama and McCarthy administration. Examples of messages referring to water and WIFIA under the Pruitt administration include:

- Celebrate #WorldWaterDay. The theme is Nature for Water & emphasizes the need to harmonize green infrastructure with grey infrastructure. Through WIFIA & State Revolving Funds, EPA is committed to protecting water by investing in water infrastructure. <link>

- We support hurricane response by testing water systems, monitoring air quality, & more. Learn more about what we do. <link>
Thanks to President Trump and Congress, #WIFIA program’s budget more than doubled in the Consolidated Appropriations Act, 2018, increasing water infrastructure funding to $63 million! Learn more at: <link>

We’re accelerating investment in our nation’s water infrastructure through our WIFIA program. Learn more: <link>

Under the Pruitt administration, water was referred to in 136 posts (14% of its posts); and in 468 posts under the McCarthy administration (12% of its posts). However, the overall discourse and messages around water show some clear differences in rhetoric and policy objectives between the two administrations. As previously indicated concerning floods and flooding, water was often discussed under the McCarthy administration in relation to the Clean Water Act and the WOTUS rulemaking proposal of the Obama administration. Besides some reference to water and water issues in general, references to water under the McCarthy administration were largely to provide information and promote their so-called “clean water proposal”. As such, references to water under the McCarthy administration are also references to “clean water” and its promoted WOTUS rule. Some examples of these messages are listed above. Others include:

In the 1970s, 2 out of 3 waterways were unsafe, but because of the Clean Water Act, today, 2 out of every 3 waters are healthy. #WEFTEC14

Tell people that we need clean water for drinking, swimming, and fishing. Join our Thunderclap.

Our proposed rule to protect clean water doesn't mean extra permits for normal farming activities #ditchthemyth <link>

Under the McCarthy administration, the WOTUS rulemaking was often referred to as the “clean water proposal”. In contrast, under the Pruitt administration, posts concerning WOTUS had a very negative attitude expressed in the messages with references to “repeal” and to changing WOTUS to address “regulatory certainty”. Although no one is for “regulatory
uncertainty”, the reference to regulatory certainty here suggests both change in policy preferences as well as a reflection of the ideological positions of both administrations. As previously discussed, the political right in the U.S. supports “regulatory certainty” for industries over the needs of “environmental regulations”, the latter of which is emphasized by the political left (Pugsley, 2012). Examples from the Pruitt dataset related to WOTUS includes:

EPA has proposed to repeal the #WOTUS. Waters of the United States rule, thus providing farmers and landowners regulatory certainty. <link>

@EPAScottPruitt in Utah stresses need to maintain clean water as well as promote regulatory certainty: <link> #WOTUS. <link>

Today @EPAScottPruitt signed #WOTUS proposed rule, supporting @POTUS order to restore the rule of law. <link>

Although the issue of hurricanes seems to be due to the external environmental circumstances, similarly to the analysis of references to the Clean Power Plan and climate change we see a potential impact of the political leadership in the discourse surrounding more generic themes such as flood and water. That is to say, even the discourse around broad issues of concern for the EPA seems to be impacted by change in political administration. Moreover, in this analysis, the policy preferences and political ideologies of the two administrators could be inferred to some extent from the discourse. Under the Pruitt administration, the discourse around water was framed by the concept of “regulatory certainty”, whereas the discourse surrounding water and water policy under the McCarthy administration was more simply focused on promoting its “clean water proposal”. Besides the fact that each administration was supporting its own policy objectives via the communication of the agency, the communication surrounding hurricanes, similarly to the communication on clean water, under both administrations, revealed a discourse of positive self-presentation that conveyed the agency was doing something positive to address the identified problems.
Another set of interesting topic terms that overlap and differ across the distinct administrations of the EPA are business, progress and American. These are interesting terms to observe and explore in the discourse given their prevalence in the messages, as well as their role in the rhetoric of each administrator, and what may be inferred regarding the impact of political change on the nature of the discourse of the agency. Moreover, these terms have a conflicting and reinforcing relationship with environmental protection activities. Although the EPA is not primarily concerned with business, they essentially regulate business and economic activity, and the actions of the EPA often come in direct conflict with certain business and economic imperatives, as well as politicians and other governments (e.g. distinct preferences at the state level). Indeed, this distinction between the priorities of “business” and “environment” is one of the great distinctions in political ideology (Antonio & Brulle, 2011; Imbeau et al., 2001).

The term business or businesses—although not the only term to refer to business activity (e.g. industry, economy and others), but potentially sufficient to highlight how the concept is expressed—is referred to under the Pruitt administration in a total of 23 posts (2.1%), and in a total of 98 posts under the McCarthy administration (2.5%). Under the Pruitt administration, three of the posts are references to “small businesses”, which include an expressive, commitment, representative and directive. The term is used in all types of speech functions. Although the term is used in a similar amount of times under both administrations, under the Pruitt administration references to business refer to the protection of business against overly strong environmental regulations, and support for policies on “superfund sites”. Overall, these examples under the Pruitt administration include:
It’s small business week and we’re here to help the +$28million U.S. Small Business sustain positive growth by advocating and advancing the business, regulatory, and environmental compliance concerns. <link>

Administrator Pruitt’s priorities: returning power back states [sic], giving our nation’s farmers and businesses the regulatory certainty they need on “Waters of the U.S.” #CooperativeFederalism

Focusing EPA on the NPL #Superfund sites will get these places cleaned up, and open for business and community enjoyment! @EPAScottPruitt <link>

@EPAScottPruitt told @FoxNews that the Paris Climate Agreement is a bad business deal for this country. <link>

In contrast, in the EPA communication under the McCarthy administration, business or “good business” is often discussed as the result of a beneficial combination of environment and economy. A message and an equation that often appears as part of the posts was the following: “Environment + economy = good business”. Many of the posts also referred to “small businesses”, their activities in relation to the EPA and EPA grants to them—out of the 98 references to business, 45 of them are for “small business”. Moreover, many of the references to business under the McCarthy administration were in relation to “clean water” and their “clean water proposal”. Often messages referring to business, and the economy, pointed to a more symbiotic or reinforcing relationship between business and regulated activity with environmental protection, which could be illustrative of the ideology of the McCarthy administration and their attitudes toward the role of environmental regulations in business. Some of the messages related to business of the agency under the McCarthy administration include:

Does your small businesses work on green tech? Apply for our #EPAsbir funding by 10/9. <link>”

Making and using cleaner, more efficient energy will give American businesses competitive edge. <link> #ActOnClimate

Did you know 80% of U.S. small business owners favor our proposal to protect small streams & headwaters? <link> #CleanWater
Businesses depend on certainty - and our clean water proposal delivers certainty and gives companies peace of mind. #CleanWater”

The term American refers to the political state and territory under and for which the EPA operates, as well as the quality of nationhood of being from the United States of America. As such, the term appeared with some prevalence in the content of both administrations, with some distinct differences and similarities. The term, as an adjective, appeared approximately twice as much under each administration than the term America, as a noun. The term American appeared in 42 posts of the Pruitt administration (4.4% of all posts), and in 82 posts of the McCarthy administration (2.1%). Although the term American may be used in reference to nationalistic feelings, it was often used under both administrations more simply to refer to the people and organizations that live in the United States. However, under the McCarthy administration, the term American often appeared with references to “American businesses”, the benefits of “clean water” and environmental protection for the economy, as well as in reference to “all Americans” and to issues with American behavior concerning their environment. For example, posts under the McCarthy administration that use the term include:

- It’s our mission to ensure that all Americans are protected from risks to human health and the environment. <link>
- Streams and wetlands are crucial for American businesses, like energy, and manufacturing. <link> #CleanWater
- Water sustains a strong American economy. Businesses depend on #CleanWater for basic operations. <link>
- Americans send 35M tons of food to landfills each year. Reduce your food waste & your grocery bill w/ our easy tips! <link>

In contrast, under the Pruitt administration, the concept of American in the EPA messages was differentiated by references to reduction of “regulatory costs”, the American taxpayer, and a
reference to “American job creators”—terms and emphasizes associated with the political right and the U.S. Republican party. Moreover, the term American was used twice as much in the Pruitt population of posts, in percentage points, than in the McCarthy dataset. Examples of references to the term American in the messages made under the Pruitt administration include:

One billion reasons to be happy: deregulatory actions saved Americans $1 billion dollars in the past year <link>

As Americans, we desire that future generations inherit a clean, healthy environment that supports a thriving economy and we have made great progress improving air quality, cleaning up contaminated lands, and ensuring our bodies of water are safe for recreation and commerce. <link>

@EPAScottPruitt on revising greenhouse gas car emissions standards: “We will get this right going forward this year. Provide certainty for the auto industry, American job creators. #EPAInAction <link>

For this discussion, I also identified the term progress to be further examined in the messages since it was a relatively common term in the Pruitt dataset, and its usage may help highlight political values that may be manifested in the discourse—that is, the issues and topics that are considered part of or constituted what progress meant. Progress is an evaluative term and what is considered a sign of progress may be distinct across distinct political parties and ideologies. In this case, we do observe that the way messages of the EPA discussed progress further point to the impact of the distinct political administrations on the discourse of the agency. Under the McCarthy administration the term only appeared in 20 posts (0.5%), whereas it appeared in 22 posts of the Pruitt administration (2.3%). This considerable difference may be surprising, since the so-called “progressive party” in the U.S. is the Democratic Party. Moreover, it is likely that it was under McCarthy that the agency was actually making progress toward the goal of “environmental protection”, not under Pruitt. However, progress is also a generic term to refer to something positive or beneficial and therefore can be used by any ideological position.
The term progress was mostly present under the McCarthy administration in the hashtag #EPAprogress and #Makeprogress. Messages that included this hashtag seem to be mostly representative information, with some directives to other sites, and positive self-presentation. Nevertheless, they also identified the policy preferences of the particular administration.

Examples of messages under the McCarthy administration include:

- Hear @GinaEPA talk about #MakingProgress on #ClimateChange. Watch the livestream at 1:25pm ET here: <link>
- Eyesores to economic drivers: EPA has been helping redevelop communities for 43 years. #EPAprogress <link>

Under the Pruitt administration, references to progress were similarly made, often as expressions of how the agency and its administrators are making general progress. However, although both administrations used the term, we can observe a clear difference in the issues and topics associated with the term progress. The previous and the following examples suggest that these references are used in messages that highlight the change in policy preferences and political parties that occurred. Although messages that include this term are not explicit regarding the distinct ideologies of each administration, we can observe how progress was associated with “fuel economy” and addressing “climate change” in the EPA communication under the McCarthy administration, whereas “progress” was associated with “superfund sites” and “restoring power to the states”, this last of which is a reference to values of “state rights” supported by the U.S. Republican party (Miller & Schofield, 2008). Examples of messages from the Pruitt administration in reference to progress include:

- Ports are critical to the U.S. economy. Port equipment and emission inventories help benchmark progress and enable informed decision making. Learn more about port-related emissions inventories in the new EPA and Port Everglades Partnership report at <link>”
The Task Force Recommendations are aimed at expediting cleanup at Superfund sites. EPA remains dedicated to addressing risk and accelerating progress at all #Superfund sites. <link> #SuperfundTaskForce

“In just one year, we have made tremendous progress implementing @POTUS.’ agenda by refocusing the Agency to its core mission, restoring power to the states through cooperative federalism, and adhering to the rule of law.” - @EPAScottPruitt <link>

Although this last set of terms were the least used in the overall messages of the agency, in comparison to the previous two sets analyzed, they also showed differences in the discourse across the two political administrations, and how these differences potentially correspond to the political parties and ideologies of the administrators in office. In some cases, the terms were similarly employed in a generic way to take a positive perspective on business, Americans and support the progress of their own actions. For example, messages under the McCarthy administration did use the term “American”, which is associated with nationalism, and often emphasized the importance of working with business. However, the term was used twice as often, in terms of percentage, under the Pruitt administration, and was also used in the context of deregulation and improving industry, values of the U.S. Republican party and conservative ideology, which was not the case in the messages under the McCarthy administration. The use of the term “business” was emphasized as complementary to environmental regulations in the discourse of the agency under the McCarthy administration. Under the Pruitt administration the term was employed together with the concept of “regulatory certainty”, and in the context of how climate change regulation would be “bad for business”, aligning with the U.S. republican party and conservative ideology that give preference to industry and cutting regulations.

7.4.3 Hashtag Analysis

In this section I present the results of the analysis of hashtags employed by the agency overtime and across administrations. Since hashtags are particular terms that may serve to index
content, as well as to create meaning and purpose for certain actions or values (Bruns & Burgess, 2011; Stache, 2015; Lee, 2018), they may also be reflective of the political party and policy agenda of the administration in office (DePaula, 2018). Figure 8 below shows the 20 most used hashtags under each administration, with a count of how often the same hashtag was used under the other administration. Figure 8 shows total counts, which correspond to the number of messages in which the hashtag was employed, throughout the first 16-month period of each administrator.

From Figure 8 below we observe that the agency under the McCarthy administration used hashtags to a much larger extent than under the Pruitt administration—as the agency also posted more than four times in the former compared to the latter administration. The most frequently used hashtags in the McCarthy administration were usually not used in the Pruitt administration, and vice-versa. The most popular hashtags under the McCarthy administration were ActOnClimate, CleanWater, EPAers, climatechange, ditchthemyth and others. As the previous analyses have indicated, these hashtags were also used in the context of the promotion of certain policies and a focus on issues that correspond to the policy agenda of the administration in office.
**Total Count of Posts that Included Each Hashtag Under McCarthy and Pruitt** *

*Most frequent hashtags shown for each, and both administrations—no bar means zero times used under respective administration. Value for actonclimate is 598.*

Popular hashtags under the McCarthy administration were used in the following way:

Know the Facts: Our proposed rule to protect clean water actually decreases regulations on ditches #ditchthemyth <link>

What can you do about #climatechange? Find out here: <link>

#DidYouKnow carbon pollution is the largest contributor to #ClimateChange. Learn more here and #ActOnClimate <link>

Beverly Banister leads health programs that help children in the southeastern region of the country. <link> #EPAers

Under the Pruitt administration, the most frequent hashtags used were *Irma, Harvey, Maria, EPA, fellowship, Recover, WIFIA, EPAback2basics* and others. The hashtags that referred
to the hurricane events do not indicate a particular political or policy agenda. As previously mentioned, the year 2017 had a disproportionate number of major hurricanes. However, the hashtag \textit{EPABack2basics} is more symbolic of the attitudes of the Pruitt administration to turn the EPA back to its “core mission”, as the administrator was quoted as saying (Strassel, 2017).

Moreover, the lack of use of the \textit{climatechange} and \textit{cleanwater} hashtags, and the adoption of the \textit{WIFIA} and \textit{superfund} hashtags show the bias against addressing climate change, and the distinction between the two administrations regarding the redefinition of WOTUS and the emphasis on a more obscure Water Infrastructure Financing and Innovation Act. Examples of messages containing the popular hashtags of the Pruitt administration include:

@EPAScottPruitt is refocusing the agency on its intended mission: protecting the environment without hindering job growth. #EPABack2Basics

Don’t forget to pack for pets! Include every member of the family when making your #hurricane supply kit: <link>

9 new #Superfund sites and 8 proposed. Protecting your health, returning contaminated land to productive use. <link>

Thanks to President Trump and Congress, #WIFIA program’s budget more than doubled in the Consolidated Appropriations Act, 2018, increasing water infrastructure funding to $63 million! Learn more at: <link>

The analysis of hashtags further shows the implications of change in political administration for the nature of the social media discourse. Hashtags are important because they are like “memes”: vehicles for information to be broadly disseminated (Truszkowski et al., 2020). Moreover, they can also be informative of support for specific policies or political ideology more broadly. These hashtags may thus index and represent the messages while indicating particular values and attitudes toward specific actions (e.g. \textit{ditchthemyth}; \textit{EPABack2Basics}). This analysis of hashtags supports the analysis of common topics terms and shows how this component of the Twitter discourse is impacted by or reflects the changes in
political administration. The change in administration was followed by a change to almost the entire hashtag landscape of the EPA Twitter page. Hashtags used under the McCarthy administration corresponded to the policy objectives of the McCarthy and Obama administrations, and the issues supported by that administration, party and political ideology, such as climate change and “clean water”. Hashtags used under the Pruitt administration corresponded to the policy objectives of the Pruitt and Trump administrations, and the issues that were supported by that administration, party and ideology, including “going back to basics”, not addressing climate change, and not implementing further regulation of the WOTUS.
8. Discussion

In this Chapter I discuss the results of this study in relation to existing theory on government communication; I discuss how these results contribute new knowledge to this literature; and I provide some potential explanations for why the results are observed as such. Let us recall the three research questions this study was designed to address:

RQ1. How does a U.S. federal government agency on Twitter use basic functions and features of text and discourse?

RQ2. How does the use of discursive functions relate to specific government communication purposes?

RQ3. What are the implications of change in political administration for the nature of the discourse? In particular, how does political party and ideology of the administration in office implicate characteristics of the discourse?

8.1 Distribution of Speech Functions and Text Features

In this section I discuss the results of the first empirical analysis of this study, addressing RQ1, which focused on assessing the quantity of the various speech functions and text features in the messages of the U.S. Environmental Protection Agency on Twitter, across distinct administrations and examining examples of how these functions of discourse were used in the messages. I also discuss the results concerning the analysis of “combined features” that emerged during the study. Since topics were analyzed differently and received special treatment in the analysis of political implications, topics are discussed separately in Section 8.3 below.

8.1.1 Speech Acts

The results of the analysis of speech acts show that most of the speech acts employed are for directives and representatives. Between 32 to 44% of all clauses were considered
representatives, and 24 to 30% were considered directives. Let us recall that representatives, in the terms of Searle (1976), are speech acts where the “direction of fit is words-to-world” (p. 354), that is, these are statements explicitly asserting something in the world to be the case. Searle (1976) also adds that in these types of statements, the “psychological state expressed is belief *(that p)*” (p. 354). We may thus think of representatives as what the speaker *believes* to be true. However, the assumption of psychological state may not be necessary for this analysis focused on explicit lexico-grammatic characteristics and, as it was conceived for this study, we may treat representatives as statements that assert, illustrate, characterize, measure, or describe some aspect of the world. However, it is important to note that these are the speech acts that can be more directly assessed as true or false information.

As previously suggested, representatives may be conceived as the broadest speech act, since *all* speech acts may be considered representative of something (see Section 3.2.6 above). Nevertheless, as defined here, these are the statements that one would need to focus on for any assessment of the reliability of the message, or the truth of the message as a representation of something (Halliday & Matthiessen, 2004). Moreover, these are the statements that can more precisely be considered *information*—that is, information as representations or descriptions of the world (Poster, 1990). Many of the content analyses of posts of government agencies on social media sites, such as Twitter and Facebook, have found that the platforms are mostly used for “information provision” (DePaula & Dincelli, 2016; Hofmann, Rackers, et al., 2013; Medaglia & Zheng, 2017). This current study, with a more detailed and linguistically sensitive framework, also shows that much of the content of the U.S. government agency social media page may be considered “information provision”, as representatives. Representatives appeared in between 58 to 61% of posts. However, representatives are not the overwhelming majority of the clauses in
the case studied—between 44 to 46% of them across both administrations. Moreover, the reliability and/or validity of these statements were not checked for this study.

In other research on Twitter speech acts, Hemphill & Roback (2014) examined tweets made to various members of the U.S. Congress on various political issues (namely issues related to “Internet freedom”, “gun control”, “immigration” and “federal budget”) and the speech acts in these posts. They found that 23% of the tweets had (or were considered) a representative. The only other category more prevalent was a directive, at 37% of the tweets (Hemphill & Roback, 2014, p. 1202). Vosoughi & Roy (2016) found that most speech acts, in the general Twitter messages on various topics (e.g. “cooking”, “Ferguson unrest”, “travelling”) were either an “assertion” or an “expression”. The assertion seems closest to the representative of this study, and expression closest to the expressive. The distribution of these two types of speech acts varied by type of topic, where events had more assertions (43% to 52% of the content); and celebrities had more expressions (49 to 55% of the content). *The prevalence of the representative speech act in the government social media context of the present study, around 44 to 46% of the clauses, is thus similar to other studies, and seems to correspond to general Twitter communication, and political communication more specifically on Twitter.*

Directives, as elaborated in this study, are those clauses or statements of text where the user commands, instructs, tells or directs the hearer/receiver to carry out an action. This is most explicitly defined by the inclusion of a verb in the imperative form (e.g. “do this”, “learn more here”, etc.). Directives are interesting in the context of government communication because they are associated with the “language of administration” more broadly (Iedema, 2000) and they indicate what the government agency wants from the citizens. This speech act was prevalent throughout the discourse, with between 24 and 30% of all the clauses being considered
directives. This speech act was not examined in the study of Vosoughi and Roy (2016) of general Twitter communication, but it was observed in 37% of the politically related posts in the study of Hemphill and Roback (2014). In the study of Hemphill and Roback (2014) the prevalence of these types of statements may be expected since these were citizens communicating with members of congress and thus likely to be using the platform to direct their congress members toward the actions and policies that are agreeable to them.

In the context of government communication of this study, we observe that directives are often used to direct the reader to further information on a topic, to direct them to take a potentially positive action (e.g. “filter water”; “be careful with infections”) or to instruct them to become involved in some agency program (e.g. “apply for our grant”). The prevalence of this speech function thus corresponds with the understanding of government communication as an implementation of “shouldness” (Iedema, 2000). As such, directives may be conceived as a type of promotion, advocacy or recommendation. In part, these messages are “promoting” the agency’s programs and resources. However, these commands or requests seem distinct from the “self-promotion” of policies and politicians discussed in the e-government literature (Medaglia & Zheng, 2017) and the “positive self-presentation” to be discussed later in this chapter.

Moreover, whereas 25 to 40% of clauses were directives, 40 to 46% of posts had a directive in it. Directives were thus common and seemed to be a way for messages to include an “extra-push”, an indication for citizens to look up more information or to explicitly direct them to a certain action or location. Such prevalent use of directives, as I also discuss in the case of question prompts, may have been due to the size of Twitter messages, which can only fit a small amount of content, and may thus include brief instructions to direct citizens for further information elsewhere. Moreover, the prevalent use of directives in this context, suggest that this
is an environment of communication for messages of instructing, dictating, compelling or directly calling citizens to engage in some activity.

The third most used discursive function was what I have been referring to as question prompts, with about 6 to 15% of all clauses classified in this category, and 11 to 20% of all posts containing this type of clause. As previously discussed, this is not a traditional speech act, but a particular type of clause which I had observed in my first acquaintance with the communication of government agencies. Previous research on speech acts have discussed “questions” and “requests” as basic and distinct speech acts or speech functions (Fairclough, 2003; Searle, 1976). However, as I elaborated in Section 3.2.2, given the context of government communication with the public, I wanted to differentiate questions or request that involved some mechanism for interaction between the citizen and the government agency, from those questions that only seemed to serve a rhetorical purpose. Since question prompts are grammatically in the same form as other types of questions, they are not so explicitly defined as some of the other speech acts. However, inter-coder reliability for this speech act was relatively high, suggesting some predictability and stability of how this concept was defined and assessed in this context.

Perhaps due to their irony, “rhetorical questions”—questions expressed without the intention to obtain an answer—are common in political communication (Gastil, 1992; Windisch, 2008). As Gastil writes (1992), rhetorical questions are a “common form of implicature” (p. 480) in political discourse, where the meaning of the statement is not literal but must be inferred depending on the content and context. The function of rhetorical questions is to make an assertion or to provide an insinuation for a response (Windisch, 2008). As Gastil (1992) also notes, such implicatures may risk misunderstanding. Since the meaning is implied rather than explicit, there is more room for interpretation. However, in this study we observe a particular use
of these questions that do not actually require the user to answer, but question if the user may be interested in the subject matter. I thus have refereed to these as question prompts. The messages seem to use these question prompts to obtain the attention of the reader, or to identify relevant readers for the message. Examples of these types of questions included: “Are you in a flood zone” or “Want to donate food to those in need?” These questions assume the reader will answer it, but the answer need not be provided. These questions were often included with representatives or with directions to more information about the topic. As it was also observed in the combination of features, about 8 to 11% of the posts used both a directive and a question prompt.

With these results, we thus observe a particular use of question prompts in the context of government communication that may be due to the short-text social media environment, where messages are competing for attention from users and need to identify users or stakeholders to whom the messages are most directed or most relevant.

Participatory requests accounted for approximately 0.4 to 5% of all clauses and 0.8 to 7% of all posts. Let us recall that this speech act is also particular for this study (see Section 3.2.2). Clauses that were included as participatory requests were also those that may not have included an explicit question or request of the citizen but may have been a representative of an event where citizen participation and involvement in government was mentioned. For example, statements that read “here is where you may provide opinions on this legislation” were considered participatory requests. The literature on government use of social media have been particularly concerned with these types of statements, precisely due to the potential of social media to enable “two-way communication”, dialogue and interaction with citizens (Bonsón et al., 2015; Medaglia & Zheng, 2017; Mergel, 2013b). Despite this possibility, studies have shown that there is usually little interaction between government agencies and citizens on social media.
sites (Bonsón et al., 2015; DePaula, Dincelli, et al., 2018; Hofmann, Rackers, et al., 2013; Medaglia & Zheng, 2017). Similarly, results of this study corroborate the findings that social media platforms are not sites for government agencies to largely send messages of interaction and participation with citizens. However, there were marked differences across administrations on the amount of use of this type of discourse, which I discuss later in section 8.3.

Studies in the e-government tradition, which have been more enthusiastic and welcoming of new technologies in government, have expected that social media use in government would bring a “transformation” to government agencies (Bertot et al., 2012; Chun & Luna Reyes, 2012; Linders, 2012). When observing that this is not in fact what generally happened, these studies have explained this based on a “low maturity” characteristic, suggesting that one day such technologies will be more widely adopted for this type of practice (Medaglia & Zheng, 2017; Reddick et al., 2017; Tursunbayeva et al., 2017). However, there are not many explanations for why social media are still not adopted more frequently for “two-way communication” and the use of participatory requests (cf. Oliveira & Welch, 2013). One potential explanation is that, while social media sites enable all users to create content (and reply to the content of others), they are not platforms for “conversations” or “dialogue” but platforms for “broadcasting” or what Castells refers to as “self-communication” (Castells, 2019). Another explanation is the sheer difficulty in engaging with citizens on social media, given the one-to-many nature of government agencies to citizens. As employees of NOAA have recently written (Lindsey et al., 2018), in reply to research by (Lee et al., 2018) there are few government agency communicators, and many more citizens with strong opinions, questions and their own directives to provide. It is thus technically impossible for one organization to dialogue with thousands or millions of users. Results of this study thus suggest that the public posting functions of sites like
Twitter, are not so much for government agencies to dialogue or to refer to conversations, but for broadcasting (some type of) information and directives.

Expressive speech acts, which are idiomatic phrases such as “Thanks” and “Congratulations”, and in this study also included expressions of sentiments, were used in approximately 4 to 10% of the posts and comprised approximately 3 to 5% of total clauses. Since expressives signal attitudes, dispositions and opinions we may assume they are types of discourse discouraged by social media guidelines of the U.S. federal government (EPA, 2014a, 2014b). In previous research, colleagues and I examined what we referred to as “symbolic acts” which included these “phatic expressions” and expressives, but also other types of positive self-presentation, which in this present research was separated (DePaula, Dincelli et al., 2018). With this more rigid study focused on a text analysis, we only observe a small minority of instances of the use of expressives, as defined here. As previously indicated, in the study of Vosoughi and Roy (2016), 32 to 40% of the Twitter posts, in the category of politics and events, were “expressions”. In the study of Hemphill and Roback (2014), these comprised 16% of the (citizen-generated) Twitter posts analyzed. In this specific government social media context, we thus find that the use of expressives is considerably lower than in other related domains, at approximately 4 to 10% of total posts and 3 to 5% of total clauses.

Results of this study show that, while social media environments are environments relatively open to anyone to create an account, and may be considered more informal sites of communication, the EPA did not adopt many expressives in its communication in the period analyzed, which may be related to more informal communication (Meijer & Torenvlied, 2016). As suggested, this may be due to guidelines on social media communication to avoid language of “endorsement”. U.S. government social media guidelines, which follow other guidelines for
government communication with the public (e.g. GAO, 2015), explicitly direct government employees to: “Do not endorse any product, service, company, non-profit organization or any other enterprise.” (EPA 2014a). Since expressions of appreciation or attitude toward a particular individual, service or activity may seem like an endorsement, they are discouraged. Consequently, it is not particularly surprising that expressive speech acts are not frequently observed in this domain. Nevertheless, there are marked differences between the two administrations, and this will be further discussed in section 8.3 below. Moreover, as I later discuss in this section, the lack of expressives does not mean a lack of “positive” and “negative” content that may be generated from the messages.

*Commissives* were the least adopted speech act, at about 4.2 to 4.7% of all posts and 2.5 to 3.2% of all clauses. Commitments, once again, are statements that explicitly referred to a promise or pledge. By this definition, commissives are speech acts that comprise an essential part of the communication of politicians, who run for government office, to their electorate (e.g. Ceron & d’Adda, 2016; Martin & Vanberg, 2008). For this study, I broadened the definition of commissives to include references to previous promises or commitments (e.g. statements such as “We are keeping the promises we made”) as well as assertions about what a particular policy or agency program will do. That is to say, instances where the message indicates that *this policy will accomplish some result* were also categorized as commissives. The rationale for this is explained in sections 3.2.3 and in the methodology chapter. Even with this broad characterization, relatively few instances of commissives were found. Similar to the use of expressives, we may suggest that *government agency communicators in this study were hesitant about making explicit commitments; referring to previously made commitments; or speculating about a future outcome*
of some policy program. This study shows that this type of discourse was present in the government social context, but at relatively low levels.

Lastly, I should discuss the declarative speech act. Declaratives have been considered a distinct speech act since it is a type of statement where the speech itself brings about what it asserts (Searle, 1976). Generally, these speech acts are backed by an institution which enables the declaration to be meaningful or effective. Such declarations may also be referred to as “official proclamations” (Searle, 1976). For example, only government officials, in pre-defined occasions, may declare a couple to be legally married; only priests, in pre-defined occasions, may declare someone to be baptized, etc. As such, declaratives are certainly something we should expect in the government context (e.g. declarations of emergency, war, etc.). We have recently observed the U.S. president using Twitter in particular for official proclamations of this sort (Jeong, 2018; Salama, 2017). However, we did not find a single instance of an actual declaration in this entire sample analyzed. This suggests that, although social media sites are platforms where the population may be reached more quickly, we observed in this study that this Twitter was not a channel for official statements to be declared by the EPA.

8.1.2 Information Representation

The analysis of information representation consisted in capturing the distribution of different types of actors being represented in the messages, the topics discussed, as well as the quantity and quality of more complex types of information, namely statistical, scientific and causal information. Topics are discussed later in Section 8.2.

The study found that the majority of posts had an explicit reference to the agency or an agency program, either via the explicit use of the agency name or agency program, or via the “we” pronoun, with 63 to 65% of all posts including such a reference. In contrast, only between
5 to 8% of the posts had an explicit reference to another federal government agency or
government actor. Slightly above this level, approximately between 11 to 14% of posts had a
reference to an external actor, such as a non-profit organization, a media agency or any other
specific individual, group or institution that was not the EPA or other federal government
agencies. Previous research on analysis of government social media content seems to not have
examined the actors being represented in the messages (e.g., Medaglia & Zheng, 2017).
However, research in this area is generally concerned with how agencies are using social media
to connect or network with others. After all, social media are supposed to facilitate such
interactions (Meijer & Torenvlied, 2016). Existing research has shown that in general,
government agencies do indeed use the Twitter platform to “share” or “retweet” content
generated by other agencies (Wukich & Mergel, 2016). However, results of this study suggest
that explicit reference to others is not particularly prevalent. In this context, less than 14% of
posts referred explicitly to an external actor. This study thus indicates that Twitter is used mostly
to provide information about the agency, with explicit references to the agency or its programs
as subject or object of the messages, with some but substantially less references to other
government and external actors.

Results of this study also show that statistical information was only used in between 4 to
8% of the posts, and that scientific and causal information was used in approximately between 9
to 11% of the posts. The rationale for looking at this specific type of information was to assess
the degree to which more complex information (e.g. information beyond event announcements,
repeated reminders, promotional content, etc.) was being conveyed to the public in this
government context. Since the EPA is both a regulatory agency and a scientific agency, I
expected this type of information would be more or less disseminated to the public via this novel
channel. As previously indicated, there has been a growing mistrust toward science and public institutions in the U.S. (Pew, 2015). Statistical information, which is more precise and potentially more accurate and valuable than other information could be used to increase trust between citizens and government agencies, since this information is more objective and verifiable. The same could be said for scientific and causal information as it is generated from independent sources and a more reliable methodology.

There are a number of cognitive biases that may inhibit people accepting statistical and scientific information as more reliable (McFadden & Lusk, 2015). For government agencies to better obtain trust from citizens it may require more than change in communication. Although the scientific process is not “value-free”, there may be a special value in using more scientific information and arguments based on the scientific process in communicating with the population (Pinto & Hicks, 2019; Rainey & Rainey, 2017). However, in this study we find that messages with statistical information or scientific/causal information are included in a minority of the overall messages (4 to 10%). This finding suggests that government communicators do not think these messages are the most useful or that they will be appreciated by the public, which may be due to an understanding of social media as a less serious environment, used for “fun and private issues” (Hofmann et al., 2013). Of course, it may also be that this particular channel (i.e. the main EPA social media page) was not conceived as appropriate for more information of this type. Whatever the rationale, and despite the potential role that government agencies may play in improving delivery of statistical and scientific information, we do not find a large presence of statistical and scientific information in the messages.
8.1.3 Positive and Negative Content

The last set of features examined in this study concern the positive and negative content of the messages examined, as well as the positive and negative presentation or framing of the agency and its programs. The intention was to understand the extent to which different levels of sentiment or psychological valence could be inferred from the messages, and to understand the approach of how the agency portrayed itself and its programs. This study found that approximately 24 to 28% of messages contained negative content, while 82 to 87% of the messages contained positive content. Moreover, 48 to 57% of the messages contained positive self-presentation. No instances of negative self-presentation were found.

In previous research on Twitter posts of local governments in the U.S., Zavattaro et al. (2015) found that most tweets were “in the neutral category” suggesting that this would be in line with a “push strategy” of “one-way” information sharing (p. 337). They also found that negative tweets comprised about 10% of messages. However, this study shows a very different picture. We observed higher rates of negative content and much higher rates of positive content. What accounts for these differences? The answer probably mostly lies in methodology. Whereas Zavattaro et al. (2015) used a generic sentiment analysis tool for the analysis of their posts, in this study the messages were manually coded. Moreover, in this analysis we considered as positive (or negative) any message that contained words or expressions that would generate either low, moderate or high positive (or negative) sentiment in the average reader. For example, words such as “smart” and “safe” were generally considered positive. Similarly, words such as “danger” and “poison” were considered negative—although these words themselves do not refer to any a specific sentiment. As such, we observe in the results a certain positivity bias in the messages, where negative content is avoided, and positive content is prevalent.
Results of this study suggest that we may not be able to think of government social media messages as “neutral”, both in terms of neutrality of sentiment and neutrality of opinion—the latter at least regarding the agency’s opinions about the agency’s own policies. Previous research has suggested that, in general government agencies ought to use plain language in their communication without “fluff” (Mergel & Bretschneider, 2013; Zavattaro et al., 2015). However, most research the e-government literature has found that these tools are used largely for “self-promotion” (Medaglia & Zheng, 2017). While Zavattaro et al. (2015) find that local government communication on Twitter “often exhibit a non-biased quality” (p. 337), here we observe that the large majority of messages use (more or less) positive terms, and this use is three to four times as the use of negative terms. Moreover, while guidelines for government agencies direct them to “not endorse any product, service, company, non-profit organization or any other enterprise.” (EPA, 2014a), we find that the agency and its programs are represented in a positive frame in about half to almost 60% of all posts. These results corroborate other research that find government use of social media is largely for “self-promotion”, where messages largely present the agency, its actions and/or policies in a positive frame.

8.1.4 Combined Features

For this study I also took the opportunity to examine more specifically certain combinations or configurations of discursive functions and features. This was not determined a priori but suggested after analysis of the messages. I examined four configurations: question prompts combined with directives; positive content with negative content; negative content without any positive content; and, lastly, negative content without positive content and without directives. The rationale for capturing these specific configurations was based on impressions of frequent or notable appearance in the messages during the coding and data analyses.
The first set of configurations reported here are the use of question prompts with directives: 56% of posts with question prompts were used with a directive in the McCarthy dataset, and 80% in the Pruitt dataset. Therefore, most posts that had a question prompt were accompanied with a command or instruction for the citizen to carry out an action or seek more information. To explain this, we should recall that question prompts in this context seem to have been used not so much to insinuate a point, but to seek attention from interested users and thus to direct the message to those stakeholders to whom the information was most pertinent. Questions such as “Are you in a flood zone?”, or “Do you bike to work?” seem to have this purpose. It thus makes sense that directives accompanied these types of questions: if the reader is interested in the particular question or the topic to which the question refers, the directive serves to instruct them on what to do or guide them on how to find more information on that topic.

It also came to my attention that many of the posts that had negative content also contained positive content. The calculations of this show that 79% of the posts with negative content in the McCarthy dataset, and 84% of those in the Pruitt dataset, also had positive content. This shows that a small percentage of posts that did include negative information did not have any positive content in the same message. An explanation for this could be based on the same explanation for the positivity bias of the overall messages: if the government agency does not want to feature negative information in general, when negative information is necessary to be disseminated, a positive response may accompany the message. This provides an opportunity for the agency to suggest how the negative event, process or thing they are discussing may be addressed by actions or information provided by the agency. A clear example of this is the following: “Tiny ticks can carry big diseases. Learn how to use smart, safe, common sense
techniques to protect yourself. The message mentions a negative fact, but then directs the reader to more information on how to protect themselves.

However, there were instances of posts with only negative content without any positive content—approximately 5% of the posts in both administrations. The rationale for examining instances of messages that had only negative content was to see how much variation there was across both administrations in the agency’s willingness to disseminate messages with only negative information. The calculation of posts with only negative information is virtually the same across administrations (4.9 and 4.5% of all posts). However, there was a difference: Under the Pruitt administration, posts that were only negative most often also contained a directive, supposedly to address the negative situation. An example of this includes: “If you’re using a generator, place it outside away from windows and doors. The exhaust is toxic and can be fatal.” The post contains negative information (“toxic”, “fatal”). But although it does not contain any positive terms or expressions, as we defined for this study, it contained a directive to address the negative content.

Some conclusions from these analyses are that, generally negative messages often contained either a positive message or a directive to address the negative content. However, the McCarthy administration seemed to be more willing to post messages that contained negative information without positive content or without a directive or instruction on how to address this negative content. This indicates that the agency under the former administration was more comfortable is disseminating messages that simply contained negative information, statistics or explanations about an issue, whereas under the latter administration this differed. However, explanations for these differences may also have to do with the specific types of information that
were disseminated and if this information warranted different types of speech acts. Further
discussion on the differences across administrations is presented in Section 8.3.

8.2 Speech Functions and Government Communication Purposes

The analysis of this study to address RQ2 examined the associations between particular
speech acts/functions and distinct government communication purposes. Although there was a
long list of these purposes determined in Chapter 2, a smaller list was compiled for an analysis.
For example, although “manipulation” and “reputation management” were all purposes
identified from the literature, these categories are difficult to determine for any a single specific
social media message. Nevertheless, a set of both agency-centered and citizen-centered goals
were determined for this analysis (see Section 6.9). For a sample of messages containing each of
the speech acts, I categorized the messages as fulfilling one or more of these government goals.
In this section, I discuss some of the more interesting results in light of existing literature and the
novel concepts that arose during this analysis.

To understand the importance of this analysis, it may be useful to recall that speech acts,
or speech functions, are named as such because their meaning can reveal a purpose or function
within a social interaction, in addition to representing or signifying something else in the world
(Fairclough, 2003; Searle, 1976). However, speech acts are also interesting because these social
functions are relatively explicit rather than implicit in the text and may be reliability interpreted,
as this and other studies show (Hashim, 2015; Vosoughi & Roy, 2016). As such, an analysis of
the speech acts and government communication goals can show how explicit features of text may
be used to determine, empirically and conceptually, what goals the government agency at
question may be pursuing in its communication. I should remind the reader that question prompts
and participatory requests were speech acts developed to fit the context of this study, but their
assessment was strongly reliable. Partially by definition, all messages deemed as participatory requests were also considered as pursuing the goals of dialogue and participation. However, besides this finding, the distributions of associations were varied. For example, participatory requests had the lowest levels of combination with positive self-presentation and policy promotion. The results thus suggest that messages that were for dialogue and participation with citizens were generally not for promoting the agency or its programs.

One may also find interesting the goals toward which question prompts were used in this study. As previously mentioned, these question prompts appeared to be used not to insinuate a point but to attract attention of users, citizens or stakeholders who may be interested or to those for whom the information may apply. In this particular analysis, question prompts were most often associated with moral suasion—i.e. instructions or information on how to act to produce a social good—in addition to information provision. Question prompts were used for policy promotion and positive self-presentation to a considerable extent, such as in “Did you know for every $1 our Brownfields Program invests in grants, communities benefit by more than $17.50?” However, in 40% of the posts analyzed these question prompts were used for moral suasion. For one, as further asserted below, this is likely due to the prevalence of this activity in the communication. However, this also suggests that question prompts were used to obtain attention from users, identify relevant stakeholders to whom the messages may apply, and also to make a point regarding socially beneficial activities the citizens should engage in.

Crisis communication has been a prevalent topic of discussion in e-government studies and studies of government communication (Hagen et al., 2018; Kavanaugh et al., 2012; Roshan et al., 2016). However, the analysis here showed that crisis communication—i.e. messages identifying a potentially immediate danger and providing information or instructions on how to
address that danger—were not very commonly associated with any of the speech acts, suggesting that it was not a common communication purpose in the messages. This is good, of course, since it may be an indication that there were not many crises to mention about. However, this is also a reflection of how crisis communication was conceived for the analysis. For example, we could potentially consider all reference to messages related to the hurricanes Maria, Irma and Harvey, as well as climate change, as references to “crisis communication”. As I discuss later in Section 8.4, the extent of crisis communication is likely related to the external events that bring such crises, many of which are, at least in the immediate dimension, generally not caused by bureaucratic or political factors. For the period analyzed in this study, we can say with some confidence that messages of crisis communication, in terms of information and instructions that clearly reflected an immediate danger, were not a prevalent use of the social media platform.

As previously suggested, many of the overall messages across all speech acts were devoted to moral suasion. Except for commissives, all types of speech acts were associated with moral suasion. Both directives and question prompts were often found used for this type of purpose, with messages such as “Food for thought: Instead of a New Year’s Resolution, how about a New School Year’s Resolution? Reduce wasted food & #feedpeoplenotlandfills”; or “Shower better to save 2,900 gallons of water annually and #ActOnClimate”.

Indeed, results of this analysis suggest that moral suasion was one of the main raisons d’être for government social media messages. Let us recognize that “moral suasion/exhortation” (Hood, 1983; Howlett, 2009) refers generally to messages that may be considered “public service announcements” where a social good is promoted. I would also like to mention that, the prevalence of moral suasion and positive self-presentation in the overall corpus, and its association with expressives and commissives, suggested to me that many social media messages
seemed to be pursuing something akin to “virtue signaling”. Virtue signaling is a relatively new term used to refer to one’s own expression of virtue, ethics or morality in social media environments other channels (Christina, 2017; Dilevko, 2019; Orlitzky, 2017). Although the term is often criticized for empty attempts of expressing one’s virtue, we may conceive of this term more neutrally, as simply one’s repeated attempts to express what may be considered virtuous activity. Some examples that may fit this category of virtue signaling include:

Administrator Pruitt is dedicated to creating policies that serve the American people. Learn more about him: <link>

“We have the knowhow, the skill, and the ingenuity we need to take on climate change.”
- @GinaEPA #ActOnClimate

We're celebrating diversity! Matthew Tejada works on environmental justice.

We believe that children should be able to play on carpet & not be exposed to chemicals that could hurt them. Here's what we're doing: <link>

The reasons for these messages may be the same as the reasons for positive self-presentation (e.g. impression management, reputation management, etc.). References to virtues, especially in relation to religion (Chilton, 2004) and moral language more broadly in political discourse is not novel (Lasswell et al., 1969). Politics may be the art of convincing others of your virtues. However, given bureaucratic and legal norms, government communication is expected to be more neutral. What we find from this study is that the government communication is characterized by ethical, moral and virtuous elements explicit in the text and implicit in the government messages, in the celebration of ethical principles such as “diversity”, as well as more implicitly in the form of touting the agency’s or the administrator’s own capabilities.

Although the expressive speech acts were partially defined by references to terms associated with ethics and morality (e.g. honor, diversity, etc.) expressives were not found highly associated with moral suasion. Nevertheless, a number of these expressives could also be considered a type
of virtue signaling, especially because these expressives seemed to not only wish happiness to others, but also take the opportunity to showcase the positive actions of the agency.

Another observation from this analysis concerns *commissives*. Although commissives were not found associated with moral suasion, all commissives in this analysis were considered positive self-presentation—i.e. positive framing of the agency, an agency activity or program. Although it seems that commitments and promises would be associated with messages relating to crisis communication, as well as references to dialogue and participation, in government. (e.g. “we commit to protect you from the on-going crisis”; or “our commitment is to have you citizens provide your input to us…”) such associations were not found with commissives. It also seemed reasonable to expect that commissives would be found with messages that attempt some *external networking* or that also include a message of moral suasion, since government agencies may want to relate their commitments to other external actors. However, these associations of commissives with moral suasion were not found in this analysis. Commissives were more often associated with agency-centered messages and were often a way to promote policies by suggesting what the agency would accomplish in the future.

Lastly, we should discuss *representatives*. Representatives are the default speech acts and are used for statements describing or asserting some quality or characteristics of the world. This was the only speech act found associated with *blame-avoidance* (Hansson, 2015a; Hood, 2011) and *counter-act media* (Entman, 2009; Hood, 2011; Liu et al., 2012; Thorbjørnsrud, 2015). *These two goals of government communication have been largely discussed in the literature but rarely appeared in the messages analyzed here.* Not surprisingly, representatives were mostly associated with information provision, which here was defined as a relatively specific and precise piece of information about some condition in the world (e.g. statements such as “Our
policies are helping people” were not considered “information provision”; statements such as the following were: “The three most common nutrients found in fertilizer are nitrogen, phosphorus, and potassium”). As previously suggested, moral suasion was a considerable dimension of the overall messages, and it is thus not surprising to see this particular goal associated with the representative speech act. The following may not be particularly surprising, given the results of this study that found that 50 to almost 60% of messages could be considered positive self-presentation. Nevertheless, representatives were frequently found with positive self-presentation, often but not necessarily in conjunction with more specific and precise information provision.

8.3 The Politics of Government Social Media Discourse

The third empirical analysis of this study, addressing RQ3, was focused on the assessment of implications on the discourse due to changes in political administration. Political influence in the bureaucracy has had a rich stream of research, mostly in the disciplines of political science, law and public administration (Almendares, 2011; Berry & Gersen, 2010; Boräng et al., 2018; Lewis, 2008; Warwick & Meade, 1980; Wood & Waterman, 1994). Studying political influence on bureaucracies is interesting because it provides explanations for an important dynamic of our systems of governance: the interaction between the political dimension, where individuals need to compete for office, and when in office are allowed some discretion in implementing the policies that correspond to their ideologies and objectives; and the bureaucratic dimension, where individuals have career appointments related to some type of professional expertise and a need to be responsive to the agency’s rules and regulations (Almendares, 2011). The extent to which bureaucratic activity is determined by the politicians in office and their associated beliefs has been discussed as the “ politicization of bureaucracy”, “bureaucratic politicization”, or “political control of bureaucracy”. More specifically, following
Almendares (2011), in this study we examine “behavioral politicization”, that is, implications of politics on an aspect of bureaucratic behavior—namely, on the discourse of the agency’s communication with the public. Moreover, I would add that the examination concerns top-down political influence on this behavior, rather than internal bottom-up politics (cf. Hirschman, 1970).

Research on the discourse of governments has generally been carried out by discourse and critical discourse analysts, largely with a focus on politicians and heads of state (Bhatia, 2006; Fairclough & Fairclough, 2013; Kienpointner, 2013) as “political discourse analysis”. Studies focused on the communication of government agencies or public bureaucracies have been fewer, but given attention by Jacobs (2011), Hansson (2015a, 2015b, 2017) as well as by scholars focused on the “mediatization of public bureaucracies” (Lundby, 2014; Thorbjørnsrud, 2015). The work of Sten Hansson, for example, has outlined various discursive practices of executive government officials, such as “blame-avoidance” (Hansson, 2015b) and “calculated over-communication” Hansson (2015a), in the tradition of critical discourse analysis. This work has outlined various “discursive strategies” by government agencies, such as “argumentation”, “perspective-taking”, “framing”, and others, that are either to “exert power” or to “hold on to power” (Hansson, 2017, p. 331-334). However, the intention of this study was to be more open and neutral to the analysis of discursive features, and also to examine a novel domain of government communication: social media messages. Moreover, although studies have examined the politics of government discourse, this seems to be the first analysis to examine how changes in political administration implicate basic characteristics of the day-to-day social media discourse of a government agency.

One of the most notable findings of this study was that climate change was one of the most discussed topics and most prevalent term in the discourse of the agency under the
McCarthy administration, but entirely disappeared during the period of the Pruitt administration. Moreover, in the one message that did reference climate change under the Pruitt administration, it was clearly expressed that it was an issue to put “to rest”. Other reflections of the impact of party and ideology on posts of the agency come from how concepts related to “business”, “industry”, “regulatory certainty” and the “American taxpayer” were employed in the discourse. Under Scott Pruitt, appointed by a president of the Republican party and ideologically conservative, the messages of the agency were focused on conveying the policy objectives of “regulatory certainty” and reducing costs for industry and taxpayer, which correspond to certain ideals of the party and the ideology. Under Gina McCarthy, appointed by a president of the Democratic party and ideologically of the political left, the messages of the agency conveyed the objectives of increasing regulation to address climate change, and expressing positive result from environmental regulations, also corresponding to ideals of the party and the corresponding ideologies. The way that several messages were framed and composed regarding certain topics thus corresponded to the policy preferences, and to some extent the parties and ideologies of the administrators and administrations of the agency at the time.

The implications of change in political administration were also observed with the analysis of hashtags, where we found strong differences in how this discursive or semiotic feature was employed in the messages of the agency, and that these differences were related to the policy objectives and overall political believes of the administrations in office. The hashtags most used under the McCarthy administration were actonclimate, cleanwater, and epaers. The first, related to climate change regulation, was already discussed. The second, #cleanwater, was associated with the #ditchthemyth campaign and promotion of the Clean Water Rule of the Obama administration. The #EPAers hashtag was associated with various messages where staff
of the EPA were highlighted and showed signs of appreciation. None of the five most used hashtags under the McCarthy administration, including #epaers, were used at all during the Pruitt administration. The most used hashtags during the Pruitt administration were: Irma, Harvey, and Maria, referring to the hurricanes respectively named. Of course, I do not suggest a political origin for the appearance of these hurricane hashtags in the discourse. I discuss these influences from the external environment in the following Section 8.4. However, some of the following more popular hashtags, namely wifia, epaback2basic, and superfund, adopted under the Pruitt administration, highlighted the policy objectives and ideological positions of Administrator Pruitt toward the role of the EPA—not focusing on carbon regulation to address climate change; dismissing the Clean Water Rule, which consolidated and clarified regulation over water bodies across the U.S. (Parenteau, 2018).

A political influence on the discourse may also be observed on how participatory requests were adopted. Although an analysis of the political influence on distinct speech acts was not carried out, it may be reasonable to highlight that, in terms of total messages, for the same amount of time, the agency under the McCarthy administration broadcast four times more posts than the agency under the Pruitt administration. Although the analysis was done on a sample of a 2:1 ratio, and the total counts of speech acts and features reflect this ratio, the ratio of posts was actually 4:1 in the population. However, not only were the number of posts greater in the McCarthy administration, so were the calls for participatory requests. In relative terms, these speech acts were used eight times (8x) more under the first compared to the latter administration. Moreover, statistical information was used, in relative terms, more than twice (2x) as much in the McCarthy compared to the Pruitt administration. The results thus suggest that, the Obama’s administration attempt to increase “participation” in government, initiated by the Open
Government Directive (Obama, 2009), as well as its more welcoming approach to the scientific community compared to the Trump administration (Rainey & Rainey, 2017), may have channeled through the communication of the EPA on Twitter.

One may be tempted to suggest that the political party and their corresponding ideologies had some implication on the use of the media for the participatory requests. The U.S. Democratic party has been considered the “party of the people” (Nicholson & Segura, 2012; Witcover, 2003), based on the broad social policies of “New Deal politics” (Hill & Leighley, 1996) as well as their traditional emphasis on the “common man” (Witcover, 2003). Moreover, empirical studies have shown that the more liberal the party, the higher the electoral mobilization of those in the lower class, and that the Democratic party is generally more liberal than the Republican party (Hill & Leighley, 1996). The study of Brown et al. (1999) showed that “states with more liberal Democratic elites and more Democratic legislatures” (p. 463) also have higher levels of registration and indirectly greater voter turnout. In general, in the U.S., more people identify as Democrats rather than Republicans (Gallup, 2015). These studies and statistics thus suggest that the Democratic party is a party that would be more interested in or benefit from greater mobilization and citizen participation in government (Dalton et al., 2001). If this is generally true, we could expect members of the Democratic party to be more willing to engage on social media with the public compared to those of the Republican party. However, as Nicholson and Segura (2011) have noted, perceptions about the “populist” nature of the Democratic party have shifted in recent years. Ultimately, given the limited nature of this study, we cannot conclusively suggest that the greater use of the platform and greater use of speech acts, such as participatory requests, under the Democratic administration is caused by the respective party and ideology.
Although it may be difficult to suggest a role to party and ideology, we may more reasonably speculate that the differences observed across administrators are due to the particular stances each administrator had to his/her role in the position. In other words, there may be a role for the individual leaders in explaining the overall level of activity on social media and the use of participatory requests in the discourse. President Obama expressed his interest in “transparency, participation and collaboration” between citizens and government by signing the Open Government Directive (Obama, 2009) in his first day in office. The agency under the McCarthy administration was so active on social media that it attempted to have citizens rebroadcast its content on other social media platforms, and got into trouble for, in a way, inciting too much participation (GAO, 2015). President Trump on the other hand, although known as the “Twitter president” himself, had no clear policies for the government to increase use of social media to interact with citizens. Moreover, it was discussed in the academic and popular press how President Trump was waging a “war on science” in the beginning of his administration (Rainey & Rainey, 2017). Thirdly, given the demonstrated antipathy toward environmental regulations of Administrator Pruitt, and the irony of having someone like him as head of the EPA (Davenport, 2017; Leber, 2017), it was not surprising that the agency under his leadership was not particularly interested with engaging with stakeholders on social media. Given this understanding, and the potential need to show the public the good that Administrator Pruitt was doing in the PEA, it is also not surprising that expressives and positive self-presentation were used 6% and 9% points, respectively, more in the Pruitt administration compared to the McCarthy administration.

Ultimately, we can say with some confidence that the analyses showed that changes in political party, ideology and policy objectives of the administration in office had some reflection
in the social media discourse of the agency, namely on the topics discussed, the rhetoric and positions surrounding some of these topics as well as in the hashtags adopted. We cannot suggest that the political party and ideologies of the two administrators and their respective administrations had a clear and direct implication on the amount of speech acts used or on the quantity and quality of other specific features of text in the messages, such as references to scientific information or external actors. However, results of this analysis, namely the consistency in the discourse over time, and the similarities of certain text features across both distinct political administrations, suggested a role for the bureaucracy, social media logics as well as the external environment in explaining characteristics of the discourse.

8.4 Bureaucracy, Social Media and the External Environment

This study was concerned with examining the implications of change in political administration on the nature of the discourse. The assumption was that this change would have some implications related to the political party, ideology and/or policy objectives of the administration in office. However, the comparative and detailed analyses carried out also brought results showing that there is much continuity in the distribution of discursive functions and features as well as specific topics and issues discussed in the messages of the agency over time. As previously elaborated, government agencies are relatively stable institutions and do not generally change drastically as a result of changes in political administration (O’Toole & Meier, 2003; Weber, 1968). Although government agencies may change due to legislative changes, laws that have been passed are generally difficult to repeal. Moreover, the jobs and infrastructure associated with bureaucracies help ensure their stability (O’Toole & Meier, 2003). Bureaucracies can change, at an institutional and behavioral level, due to legislation or specific administrations (Fountain, 2001; Ingraham & Ban, 1984). However, their main mission and goals, generally
persist over time. We may thus speculate that the results of these analyses suggest that the consistency in discourse over time and across administrations, as well as the focus of the discourse on themes and issues associated with the mission of the agency, may be explained by the stability of bureaucratic norms and the bureaucratic goals of the agency.

There were also some results of this study that suggested a role for the social media platforms in influencing characteristics of the discourse. Studies of social media have proposed a variety of “norms, strategies, mechanisms, and economies” associated with the structure and use of these platforms, often referred to as “social media logics” (van Dijck & Poell, 2013). Results of this study point to two particular characteristics or norms of social media that seemed to implicate the nature of the discourse: social media format and, what I will refer to as, user control. The first is more direct and structured in the platform. Different social media platforms allow for different modality of communication (e.g. text, pictures, videos, etc.) as well as length of messages. Twitter initially restricted the length of each post to 140 characters and changed this limit to 280 characters in November of 2018 (Perez, 2018). Although Facebook, for example, does not have this restriction, the average length of posts on this platform have been found to be about 108 characters (Cvijikj & Michahelles, 2011) and 160 characters in a domain-specific environment (namely, for tourism organizations, see Mariani et al., 2016). Generally, social media are recognized for their brief, short-text messages. Moreover, Twitter, like Facebook and other similar platforms, enable the use of hashtags and we observed this was a relatively prevalent feature of the overall discourse of the government agency. The character limit and this provision of a specific modality of text, namely hashtags, seemed to help define the quantity and quality of the overall discourse of the messages of the government agency.
Another set of qualities of social media that likely impacted the discourse of the agency are related to user control—the fact that the user/organization chooses how to structure the message. In the first case, user control enables government agencies to communicate their messages without any filter of other media channels. The impact of this, conceivably, is to enable the agency to construct the message to the citizens exactly as it wishes. As environments of user-generated content, users are more likely to post messages about themselves in a positive way rather than in a negative way (Lee-Won et al., 2014; Reinecke & Trepte, 2014; Rui & Stefanone, 2013; Spottswood & Hancock, 2016). The rationale for this has been explained in different ways, but they are often based on theories of self-presentation as developed by Goffman (1959), and, in organizational contexts, “strategic self-presentation” and “impression management” (DePaula, Dincelli, et al., 2018; Jones & Pittman, 1982; Mothoagae-Sävström, 2019; Rui & Stefanone, 2013). Basically, these theories suggest that when people and organizations are able to act strategically and control their own presentation to others, they will generally focus on different forms of positive or favorable presentation. Given that on social media the agency has control over how to portray itself and given that most messages are about or in reference to itself, tendencies for strategic self-presentation, image impression and reputation management are unrestricted. Although this is not treated as a “causal factor” here, consideration of the media platform helps explain the observation that regardless of the political administration in power, the government agency focuses largely on providing messages with positive content, and in approximately every other message it presents itself or its actions with a positive frame.

Lastly, I would like to add that, to explain the nature of the government discourse on social media, we need to recognize the role of events in the external environment. In studies of the general communication of government agencies on social media, “external events” do not
seem to be a factor explicitly acknowledged as influencing the communication. However, studies in e-government and crisis communication have considered the content of messages of government agencies on Twitter and Facebook in various types of crisis situations such as the zika virus epidemic in the U.S. (Hagen et al., 2018), water contamination issues in China (Yuan & Gascó, 2018), and riots in England (Denef et al., 2013; Gascó et al., 2017). In these messages, government agencies are clearly addressing a major external event in their communication. However, previous studies do not seem to have examined the extent to which the communication of government agencies relate to events happening in the external environment.

I noted earlier in this Chapter how crisis communication did not appear as a major category or “goal” of messages, compared to the other categories, in the discourse of the EPA agency studied here. Analysis of crisis communication was not an intention of, nor was it explicitly articulated in, this study. However, the results of the analysis carried out do indicate that major events in the external environment were reflected in the communication of the agency. In particular, I refer to the communication about Hurricanes Harvey, Irma and Maria in 2017. Under the Pruitt administration, the agency communicated about these hurricanes to a considerable extent, as observed by the most frequent topic terms and hashtags, including with instructions and information about flooding and contaminated water. Moreover, we could say that the communication under the McCarthy administration was also impacted by events of the external environment, if we consider the extent to which the overall discourse of the agency during this time was about acting on climate change. The results of this study thus suggest that in addition to political, bureaucratic and social media factors, we need to consider events from the external environment as an important influence in the discourse of the government agency.
8.5 An Outline of a Genre of Government Social Media Discourse

In addition to the various pieces of insight previously discussed, I would also like to offer a more general synthesis of this study and propose some basic characteristics of what we may call the genre of government social media discourse. The intention of this study was not to fully develop a theory of genre; it was intended to comprehend how basic functions of speech and relevant features of language and text are used in the context of government social media communication. However, as discussed in Chapter 3, the approach of this study lends itself to observing how discourse components—namely, speech functions, representation and identification—are configured in this context of politics, bureaucracy and media.

The concept of genre has had a long history in studies of language and rhetoric (Hyland, 2002; Miller, 1984). Hyland (2002) discusses three distinct schools of thought on the concept, one of which is the systemic functional linguistics (SFL) approach taken in this study. In general, genres are ways of using language. Moreover, discussions of genres generally assume a relationship between the text and the context. Hyland (2002) writes that, there are two central assumptions underpinning genre analysis: “that the features of a similar group of texts depend on the social context of their creation and use, and that those features can be described in a way that relates a text to others like it and to the choices and constraints acting on text producers” (p. 114). Moreover, within SFL, genres are dependent on the “social purposes” and “goal-oriented processes” (Martin, 2011) that define a structural pattern of discourse. Hyland (2002) also writes that genres are “rhetorical actions” that represent “effective ways of getting things done in familiar contexts” which may involve an exploration of the “lexico-grammatical and discursive patterns” that can define the genre (Hyland, 2002, p. 116).
Given this basic description of genre, one may suggest that government communication itself is a type of genre. Studies of government communication (Hansson, 2015a, 2015b, 2017) and the “language of administration” (Iedema, 2000), from a discursive and rhetorical perspective, have examined functional and lexico-grammatic features of discourse in this context. However, it is unclear if an attempt has been made to describe government communication as a particular genre. This may be due to the fact that government agencies communicate via a variety of media and situations. As genres are generally conceived as based on recurrent “situation-types” (Miller, 1984; Hyland, 2002) or “rhetorical situations” (Bitzer, 1992)—such as the classroom, the courtroom, the presidential address, etc.—there may be multiple genres within the larger context of government communication.

Social media are not types of “situations”. However, they are a particular type of media with particular constraints and affordances (Chen et al., 2016; Majchrzak et al., 2013), and tendencies (van Dijck & Poell, 2013). Moreover, we may conceive of government communication with the public as a type of context. Government social media messages may thus relate to various types of situations as well as more specific contexts or domains (e.g. environmental protection, military defense, etc.), and the communication in these contexts may refer to event reminders, public service announcements, the sharing of new public policies, as well as messages relating to emergencies and crises. Indeed, government social media discourse may be a particularly broad arena for which to develop a notion of genre. Nevertheless, the consistency in the distribution of the various features of messages, as well as the understanding of the political-bureaucratic-media context, suggest that some generalities may be attempted to characterize this type of communication as a genre. As I see them, the results suggest this type of discourse to be: (1) a discourse highly characterized by the presence of directives and question
prompts; (2) a discourse that can, to a lesser or greater degree, be manipulated by the political administration in office, in terms of topics discussed and attitudes toward those topics presented; (3) a discourse largely characterized by positive language and rarely negative language without a positive resolution; and (4) a discourse that is highly positively self-referential, although often implicitly.

The consistency of discursive functions and features were clearly observed in Sections 7.2 and 7.3, with the analyses of the distribution of the discourse categories. Even the combinations of discursive features (e.g. combination of directives with question prompts; negative content with positive content, etc.) showed a relative consistency across both administrations. Only statistics and participatory requests had large differences in their appearance in the discourse of the agency under the distinct administrators. This relatively consistent discourse is characterized by a large number of representative clauses, which could be expected since this is the basic form of statements about the world, but also by the presence of directives and question prompts. As previously discussed, question prompts may have been used as a tactic to gain the attention of citizens and lead them, or direct them, to other sites with more information. In approximately 8 to 11% of the posts, these two discursive functions were employed together in the same message.

It should not come as a surprise that directives were common in the government discourse. The “language of administration” (Iedema, 2000), and in particular the language of bureaucracies, has been noted as being highly characterized by its directives, in order that the institutions may impose constraints and realize its mandates (Iedema, 2000). Given the quantitative and corpus analytic approach of this study, a more fine-grained analysis of all the configurations of directives was not carried out. Nevertheless, results indicate that directives in
this context were generally not strict commands or orders, but often suggestions in imperative clauses to direct the user to find more information in a different location and attempts to persuade the citizens to carry out some actions that may be beneficial for them. As seen in Section 7.1, examples include: “See the evidence for yourself”; “Look for this”; “Follow him”; “Teach young farmers to combat pests”, etc. In some cases, directives were also more forceful for situations that could pose a danger (e.g. “Stop the mold!” and “Keep safe!”). Directives were thus used for various purposes and situations, and these purposes and situations seemed to present themselves across administrations.

Although there is consistency in much of the discourse, results of this study do suggest that topics and issues discussed were impacted by changes in political administration, and those changes, to some extent, corresponded to the ideologies and policy objectives of the distinct administrations. Although this political dimension of bureaucratic communication may be more or less pronounced in different types of agencies, and/or agencies at different levels of government, this influence was apparent in the case studied here. Theoretically, changes in political administration may also lead to changes in other discourse categories, such as how often commitments and expressives are made, based on the leadership or personality of those in power. Indeed, I suggested how references to statistical information and participatory requests could have been influenced as such. Nevertheless, the study suggests that, although lexico-grammatic features of the discourse may remain the same, particularities of rhetoric and topics are variable due to political elements.

Another major characteristic of the discourse that could be defining of this genre concerns the prevalence of positive terms—terms and expressions that generally engender positive emotion or psychological valence (e.g. “safety”, “smart”, “better”, “protect”, etc.).
Across both administrations, 82 to 87% of messages were determined to have a positive term, word or expression. This characteristic of the discourse suggests that the government social media messages are not generally neutral in terms of the sentiment that they may bring to the audience: they are overwhelmingly positive. Moreover, 80 to 84% of messages that contained negative content also contained some positive terms, ostensibly to resolve or provide a solution for the negative frame of the message. As previously suggested, this large “positivity bias” is probably associated with the reputation and image management prerogatives of the agency that are enabled and potentially exacerbated by the user control of social media sites.

The last characteristic of this genre of discourse is that a considerable amount of the discourse explicitly associates the government agency with some positive action or outcome, what has been referred to as positive self-presentation. Research on government use of social media have identified this behavior on various studies of different types of agencies at different levels of government (e.g. Medaglia & Zheng, 2017). This study corroborates those findings. In this study, the positive framing of the association is sometimes relatively weak. For example, in the message: “Consider applying for credit assistance from WIFIA! Deadline to apply is July 6, 2018. Learn more here: …”, “credit assistance” is considered slightly positive, and also “learn more” was considered slightly positive. In another message, e.g. “We’re leveraging all our available resources to support communities recovering from hurricane damage: …”, the terms “leveraging all … available resources” and “supporting communities” were considered positive. Given the prevalence of messages with this discursive component, as well as the theories that contextualize the abundance of this positive self-referential content, it seems reasonable to suggest that this is a defining and general characteristic of this genre of communication.
9. Conclusions

The world is currently under a pandemic of a “corona virus”, namely of SARS-CoV-2 or COVID-19. During this pandemic, government communication has been an important aspect on how the pandemic is handled: how information is provided to citizens in order for them to understand the issue and follow new guidelines of economic and social practice, including social distancing. Although it is difficult to fully understand the impact of different communication strategies, discourse tactics or choice of messages in this current situation, we can assume that the response of the population may be impacted by ways government actors communicate with the public (Hood & Margetts, 2007; Shoemaker, 1989; Weiss & Tschirhart, 1994). This study, focused on recurrent and routine communication, examined various dimensions of discourse in the messages of the U.S. Environmental Protection Agency on the Twitter platform over a multi-year period across two distinct administrations. The analyses produced a number of findings that addressed three empirical questions. In the following sections I summarize some of the theoretical and practical implications of this study. I also outline several limitations of the study and propose some avenues for future research.

9.1 Theoretical Contributions

The main goal of this research was to understand how language is used in the context of social media use by government agencies. The study was driven by a desire to understand this linguistic phenomenon with an investigation focused of the U.S. federal government on Twitter. In the discourse literature much attention has been paid to the language of politicians and heads of state (Bhatia, 2006; Fairclough & Fairclough, 2013; Lee & Xu, 2018; Triantafillidou et al., 2018; van Dijk, 1997; Wodak & Forchtner, 2017). Moreover, as Chilton (2004) noted, linguistic approaches to studying political communication have generally viewed “political discourse in
terms of social group or elite exploiting, controlling or distorting language in order to preserve its own position” (p. 197). In his highly cited and more balanced study, Chilton (2004) examines the discourse of politicians as largely one of “legitimization”. Nevertheless, discourse scholars seem to have not investigated the discourse of government messages on social media, and therefore have not explored, critically or otherwise, the communicative and linguistic aspects of this type of communication.

From another end of the spectrum, approaches focused on management and public administration, many of which have focused on content analyses of government social media messages, treat social media in government as a problem of technology adoption, and, from the start, as potentially “transformative” tools to improve government services (Criado et al., 2013; Meijer & Thaens, 2013; Tursunbayeva et al., 2017). These administrative approaches, however, generally do not pay attention to details of language and the communicative aspect of these processes. Under e-government studies there seems to be no analyses of the discourse of government messages on social media.

This interdisciplinary research thus contributes to both the literature on government communication and political discourse analysis, as well as to the e-government and public administration literature on government adoption of technology. This research provides what seems to be one of the first studies on the various aspects of language and rhetoric of the messages of a major U.S. federal government agency on Twitter. This study thus reveals an important aspect of this political, bureaucratic and technological process that is prevalent and essential to government activity. In building on previous studies, this study explores the language, including how and what information is being “pushed” and “pulled”. Moreover, I believe this study also contributes to the aforementioned disciplinary traditions by providing both
a critical view of this government activity, while also considering the benefits and challenges of this activity for citizens and government actors respectively. Whereas discourse scholars are largely critical of government action and government communication, focusing on the power conflicts inherent to this political process; and whereas e-government scholars focus on the benefits and transformative potential of government use of new technologies, this study integrates these perspectives for a comprehensive consideration of the various facets of the discourse of government messages on social media.

More specifically, one contribution of this study is the demonstration of the distribution of the basic speech acts/speech functions used in the context of U.S. government agency discourse on Twitter. This study shows some of the mechanisms of how content, information and/or messages are “pushed” and “pulled” in terms of linguistic characteristics. This study showed that only a relatively small percentage of messages were used for participatory requests, commissives and expressives, and most messages were used for directives and representatives. Some of the distribution observed was not particularly surprising. Research has shown that government agencies do not generally use social media sites to dialogue with the audience or to call for citizen participation and collaboration. Moreover, directives are statements natural to the bureaucratic context, and representatives are the basic form of “information provision”, having been found to comprise a substantial amount of the discourse is other similar domains. However, despite the prevalence of representatives in the messages, the assessment of the distribution of statistical information as well as scientific and causal information was relatively low. This suggests that while much of the content may be considered “information provision”, as other research in e-government have argued, a small percentage of it, in the case studied, is for more
objective and verifiable information beyond basic event announcements or statements of positive self-presentation, which could also be considered “information provision”.

Another contribution of this study concerns the finding of how question prompts are used in this context. This study showed that a substantial amount of the messages makes use of this discursive and rhetorical tactic to potentially identify relevant stakeholders for the messages, and thus better direct the content for those to whom the information may apply. These rhetorical devices may also help attract individuals to a particular type of content by first asking the citizen/reader something rather than making an assertion. This study thus showed some careful consideration on the part of government communicators to direct their messages to particular audiences and to compete for attention of citizens in the crowded newsfeed of Twitter audiences. This finding thus adds a particular insight to theories of government communication and government discourse on social media regarding government rhetorical tactics on Twitter.

A contribution of this study was also the examination of the identification/evaluation dimension of discourse, namely the dimension of sentiment and appraisal in the messages of the government agency at question. Although many studies of government have been concerned with the concept of neutrality, only a few studies seem to have examined sentiment and evaluation in this context (e.g. Zavattaro et al., 2015). However, the manual content analysis and reliability check of this study provides an additional measure of assurance for the results. Previous research has found that government social media are often used for “self-promotion” and we observed here as well relatively high levels of positive self-presentation. However, this study also showed that there is a general “positivity bias” in the content when we acknowledge how the discourse is replete with words such as “safe”, “protect”, “smart”, etc. Although
negative terms, such as “poison”, “danger”, “pollution” are not uncommon, they are most often accompanied with positive terms, ostensibly to show how the agency is addressing those issues.

Another distinct contribution of this study came from the assessment of the relationship between functions of speech and functions of government communication, that is, the association between speech acts and government communication goals. Previous studies have examined how language and discourse is used to pursue various government goals, such as blame-avoidance, legitimization, over-communication and positive presentation. However, each of these studies, in and of themselves, have focused on a narrow set of purposes, and usually beginning with the particular purpose (e.g. blame-avoidance) and then looking at how language in some domain or situation is used to accomplish this. However, these studies have not examined how language is employed in the context of Twitter government social media discourse to pursue or accomplish the various distinct purposes of government communication. In addition to the focus on a new domain, this thus showed the relative distribution of how various government goals, including both citizen-centered and agency-centered goals, are sought with the various distinct speech functions available in language. This study thus contributed to the e-government literature by showing how linguistic features relate to purposes of government communication.

One of the other major contributions of this study was the examination of the politics of government discourse on social media. As mentioned, most studies of government discourse have focused on the discourse of politicians, heads of state and legislators. Studies of government messages on Twitter and Facebook have not previously examined the implications of changes in political administration on the discourse and the character of the social media messages, or the social media content. Although this study demonstrated that much of the communication remains the same, as I previously discussed and summarized, it was relatively
clear that the change in administration had an impact on the topics discussed as well as the hashtags employed by the EPA. There was also some speculation about the potential impact of politics on some of the other dimensions of discourse, such as the use of participatory requests as well as statistical information. Nevertheless, the analyses here more clearly suggest that changes in topics, change in how the topics were composed and discussed, as well as changes in how hashtags were employed, were partially due to the party, ideology and policy objectives of the respective administrations in power. This study has thus contributed to our understanding of political influence in government discourse, or the politicization of the bureaucracy, in the context of government use of social media, and perhaps more broadly in the politics of technology adoption in government.

An additional contribution of this study, although not empirically assessed and mostly speculative in this study, was the consideration of the various factors that implicate the character of the discourse of government agencies. As explained in this dissertation, the discourse of governments could be explained by the various dimensions related to: the stability of bureaucracies in general and the missions of particular agencies; the characteristics of the social media environment and the control granted to users for broadcasting; as well as changes in the external environment that implicate what is appropriate and relevant to discuss. These dimensions of bureaucracy, media and environment are likely necessary factors or components to consider, in addition to political dynamics, to explain the nature of government discourse and their social media messages.

Lastly, this study makes a theoretical contribution for the understanding of a potential genre of government social media discourse. Admittedly, such as a theory would require further investigation, including investigation of the discourse of other types of government agencies, and
potentially other social media platforms as well; the discourse examined in this study may be particular to the EPA and/or Twitter. Nevertheless, this study provides an initial sketch of a potential genre of government discourse. As previously indicated, genres of language are based on the use of particular features and functions of text with the particular purposes for, and context/institution in which the discourse is carried out. Government discourse has been largely explored by Hansson (2015a, 2015b, 2017), but not necessarily as a genre. Iedema (2000) discussed extensively the use of Command/Directives as a genre within the “language of administration”. However, this study suggests that there may be specific linguistic resources that government agencies regularly utilize and that correspond to their political, communicative and bureaucratic prerogatives. In this study, some of these linguistic resources and ways of using them have been discussed and suggestive as genre-defining (e.g. directives, question prompts, positive self-presentation). Future research may explore further how these functions and features of text are expressed by distinct agencies to more fully and comprehensively develop a theory of a genre of government discourse on social media.

9.2 Practical Implications

In addition to the theoretical contributions of this study, I also outline below some practical implications of the findings. I consider legal implications, implications for government agency communicators, implications for citizens/stakeholders, and technical implications for text mining and natural language processing of government social media messages.

As was observed with the review of the analysis of the Government Accountability Office regarding the communication of the EPA on social media sites, government agencies, their administrators and communicators need to recognize that there are various laws concerning government speech (Blocher, 2011), as well as specific social media guidelines for their
respective agencies (EPA, 2014a, 2014b). GAO (2015) found that the positive statements made by the EPA on social media about their own policies, did not rise to the level of “self-aggrandizement” and they were not a violation of the prohibition on “publicity or propaganda purposes” (p. 11-12). What was considered a violation of policy by GAO (2015) was the non-identification of the agency on a message that was broadcast and promoted by the agency (“covert propaganda”), and the associated request that citizens contact their legislator to support a specific policy (“grassroots-lobbying”). Therefore, legally, government communicators in the U.S. seem generally allowed to promote their policies, programs and actions on their social media channels, as long as this communication does not rise to the level of those two types of activities.

However, government communicators may want to consider how they use language in fulfilling their intentions for improved image, impression and reputation; moral suasion of the public; and/or dialogue and participation with citizens. This study did not examine whether or not the various discursive dimensions employed by the agency actually had some effect on the public, such as improved image, improved reputation, or better citizen response. Nevertheless, we have learned about tools and frameworks that can help us understand the distinct linguistic components of messages, and how these functions and features of text may be utilized within the context of certain government purposes. The results of this study indicate that there is a certain positivity bias of the content and citizens may be aware of this, interpreting it as a lack of neutrality by the agency, and potentially too much “publicity or propaganda”. Moreover, there has been relatively little use of statistical information, the use of which could provide more precise and objective information to the public. Government communicators may thus want to consider how details of how they employ distinct “discursive strategies” could raise (or not) the
importance and image of the agency in the mind of the citizens. Ultimately, this may not be via explicit assertions of vague evaluations, but via the use of statistical information, scientific information and better recognition of the bias in the content in terms of positive and negative sentiments that may be conceived and interpreted by the public.

For citizens, this study showed the various ways that government agencies may communicate with the public. Understanding the political, bureaucratic and media context of this communication, as well as the distinct and sometimes conflicting purposes of government may help citizens appreciate the difficulty and complexity in which government communicators may find themselves. Moreover, having a more sensitive understanding for the various ways that language is employed in this context, may help citizens better appreciate and interpret what government communicators are trying to accomplish. Results of this study show that citizens may expect a certain degree of politicization of the communication, as well as aggressive efforts to promote certain policies (e.g. GAO, 2015). Nevertheless, citizens may want to consider whether or not this politicization can fulfill a largely positive social goal, and ultimately have a positive impact in their lives (Weiss & Tschirhart, 1994). For example, if certain policies are truly needed and helpful for the overwhelming majority of citizens, should the government agency not be actively promoting these policies, while also providing objective and factual information about them?

Lastly, I would like to suggest some practical implications of this study for text mining and natural language processing analysis. Since government agencies are public institutions, and their actions affect large numbers of populations, their communication activities are of concern to students and academics of government, as this study suggests, as well as various stakeholders. Therefore, developing a computational system to identify, aggregate, summarize, and/ analyze
these social media posts, may be possible. This could prove valuable for citizens, government officials, journalists and academics alike to better monitor and understand how these media are being used by government agencies. For example, for a study previous to this dissertation DePaula and Harrison (2018) examined U.S. EPA Twitter content via LDA topic modeling. Since the language analysis here is largely focused on lexico-grammatic characteristics of text, text mining and natural language processing systems may be used to reliably assess the discursive components. There are many information systems and data science tools and techniques nowadays used for identification of positive and negative sentiment (Ceron et al., 2015; Taboada et al., 2011), as well as topic terms from messages (DiMaggio et al., 2013; Hagen, 2018) and speech acts from social media text (Vosoughi & Roy, 2016). The reliability results of this study, although not excellent in certain cases, was often strong or moderate, suggesting that this type of automated analysis is also possible in the government social media context. This research thus provides a foundation for the development of systems that could implement and deploy interactive and/or more open and accessible systems of analyses of government social media messages.

9.3 Limitations and Future Research

Although care was taken to produce research that is comprehensive, targeted and also with a strong empirical component, there are some limitations and shortcomings of this study. The main ones may be: the issue of time and agency coverage; the size of Twitter messages and the text focus; the reliability of certain discourse dimensions; the lack of a study of effects of the communication; the limited nature of the definition of certain functions and features of text; and the lack of a view from inside the agency. In this section, I discuss these issues and how future research may address them.
9.3.1 *The Issue of Time and Agency Coverage*

Although this study covered a period of nearly 2.7 years, the two administrations studied were more than two years apart, and the study did not include an analysis of the first administrator of the agency when EPA acquired a Twitter channel. This longitudinal analysis was also a strength of the study. The fact that the distribution of discursive functions and features are relatively similar over this long time period (over 5 years between the beginning of the McCarthy administration until the end of the Pruitt administration) shows that there is something consistent about this form of communication. However, the study does not provide a comparison with the first administrator under President Obama, Administrator Lisa Jackson, who began her tenure in January 2009. Moreover, given that the study was focused at two distinct periods of time, I did not study the agency under the same or similar conditions. Such a comparison would have been valuable to observe how distinct administrators and administrations respond to the same ongoing events, such as hurricanes, floods or other significant issues in the external environment, which were prominent topics of the discourse. Furthermore, given the focus on two administrators and a generalization about their administrations, as well as the primary focus on language analysis and government communication purposes, the assessment of the effects of party and ideology are limited to the specific context.

A related shortcoming of this study is the focus on one single agency on one social media platform. In order to generalize the use of social media by government agencies, it is necessary to analyze the messages and discourse of various agencies and platforms. Although the discussion throughout this dissertation is often about social media broadly, the empirical results come from the use of Twitter alone. The rationale for keeping this study focused on this particular case, was to also be able to provide a comprehensive and detailed discourse analysis,
or, more specifically, a corpus analysis, or corpus-based discourse analysis. However, this also meant that, ultimately, the empirical results here are limited. Future research may thus explore the messages of other federal government agencies, and other social media platforms, in the U.S. and around the world, and examine whether the conclusions and tools employed in this study are useful and validated in other domains. For example, certain discursive functions and features of text may be used in similar or different ways, for example, in military communication on Facebook; or in the use of Instagram by different types of government agencies.

9.3.2 Size of Twitter Message and Text Focus

Another limitation of the study, which is related to the focus on the Twitter platform, is the size of the messages of the corpus. This is, of course, not a shortcoming of the framework or methods, but a fact of the size and structure of Twitter posts. Twitter posts are brief statements of one to three sentences, and what may be said in these messages itself is limited. Therefore, the genre of discourse observed here may be greatly affected by, or defined by, the length of the message allowed. Social media public communication is generally associated with “short-text” messages, and not long articles (Cvijikj & Michaheles, 2011; Perez, 2018). However, different limitations and tendencies may be the case on other social media platforms. Moreover, this analysis focused on text, and not on the other modalities of social media communication—e.g. images, emojis, videos, other symbolic representations (e.g. hearts, stars, flags, etc.)—that are becoming prevalent on social media “multi-modal discourse” (Jovanovic & Leeuwen, 2018; Parkwell, 2019). Future research may thus explore studies of social media platforms and the impact of these different platforms on characteristics of the various modalities of social media discourse. Moreover, as recent studies have noted (e.g. Parkwell, 2019), this novel symbolic
content of social media may transform the communication of government agencies. Understanding their nature and consequences may thus be of further academic interest.

### 9.3.3 Reliability Measures and Subjectivity

Another limitation of this study concerns the reliability assessment and the issue of subjectivity in the determination of what is and what is not a particular speech function or feature of text. While this study followed conventional methods of reliability assessment for the main coding task addressing RQ1, some dimensions, in particular positive (0.74) and negative content (0.76), as well as the concept of scientific and causal information (0.65), had moderate to low measures of reliability. It is not surprising that the latter concept did not fare well in the assessment of inter-rater reliability, as it was a first attempt to identify such type of content in terms of lexico-grammatic structure of government social media messages. Nevertheless, it is better than chance and future studies may improve on the rules for defining and coding this dimension of discourse. Sentiment analysis has been applied for various types of documents and social contexts, but this is the first study to my knowledge to assess the quality of sentiment analysis in the context of government communication on social media, which had relatively good results.

Analysis of positive and negative sentiment from text is particularly difficult because people have different types of reactions to the same words or expressions. Whereas some may see collaboration across government units as positive, others may see it as a waste of resources; whereas some may view announcements of environmental protection as a good thing, others may see it as propaganda. In such analyses, it is important to understand the biases of the individuals interpreting the information (Liu, 2010). In this study, I would later notice that that messages that referred to “diverse people to tackle diverse challenges” and “the agency’s new carbon pollution
standard” were referred to as positive, but depending on the political ideology of the person, and their understanding of the existing social and political context, they may have seen otherwise. Future research may further explore the issue of sentiment determination in the context of government communication. Party affiliation and ideological position of the readers of messages may have an influence in the determination of what is positive or negative (Lind et al., 2017). Nevertheless, I would like to emphasize that certain concepts such as “environmental protection” and “chemical regulation” are probably generally recognized as good or positive, but may be determined otherwise based on specific points of reference, such as the specific contexts in which such concepts are discussed.

9.3.4 Effects of the Communication

Another interesting and relevant consideration that was not examined in this study are the effects of the use of all of these distinct types of discursive functions and features of messages on the audience. Although it is argued that certain messages are pursued, directed to, or have the purpose to change behavior or cause some effect, these relationships are not studied here in full. This is thus a fruitful area for future research. For example, future research may want to explore the effects of distinct discursive characteristics on measures of popularity, such as likes, shares and comments. In a similar study, DePaula and Dincelli (2018) examined how these measures of social media engagement were biased toward, or more directly affected by, discourse on “symbolic acts” and positive self-presentation compared to information provision and more neutral and plain government announcements. We argued this was a consequence of the “affective bias” of social media communication. A similar analysis with components of this dissertation may show a more nuanced and extensive relationship between discourse and audience response. Ultimately, the analyses of likes, shares and comments on social media posts
is limited in what it can say about the value of the communication to the public, although it has been previously regarded as potential measures of citizen collaboration with government agencies (Zavattaro et al., 2015). Future research may thus examine more specifically if government use of social media, and the use of particular types of discourse, may influence how citizens perceive the agency (e.g. how the use of social media improves the agency’s actual reputation in the public view). While this may be better assessed for local government, which are closer to the citizens they serve, conceivably this may also be studied at the federal level.

9.3.5 Depth of Analysis of Discursive Features

An additional limitation of this study concerns the limited set of discursive functions and features of text examined, that is, more precisely, the limited depth at which some of these characteristics of discourse have been examined. This study shows that messages contain a complex set of speech functions, which are distinct speech actions, and may be associated with various purposes of government communication. Although the framework employed is comprehensive in the sense that it addresses the three broad meanings of discourse, it does not fully explore the extent of the hierarchy and configurations within this typology. For example, in regard to forms of evaluation, there are multiple types of appraisal and judgement, such as those related to morals and duties, and others related to basic human emotions, such as grief and anger (Martin & White, 2005). These were not distinguished in such fine detail here. Moreover, the representative clauses, the most numerous in this context, could be further studied for their deeper forms of justification or explanation. Representatives do not simply represent information, or reflect situations in the world, but can also provide more or less detailed explanations or argumentation (van Dijk, 2014). That is to say, representatives do not only assert, but sometimes provide justifications, explain, develop, argue, etc., potentially as forms of
legitimization (Chilton, 2004). Future research may further investigate how government agencies make arguments and justifications in their social media discourse, potentially to persuade citizens, and hopefully to provide good arguments and rationalizations for their actions.

9.3.6 Views from Inside the Agency

One last and briefly noted limitation and potential direction of future research concerns the views of the employees—the government actors—who actually prepare these messages. This study was initially conceived as an analysis of the discourse, regardless of the personalities of the individuals in charge of creating the messages and their perspectives on the activity. However, interviewing these individuals could provide additional insights into why the messages are generated a certain way; what the government actors think of when developing these messages; what, if any, are the goals of social media communication discussed inside the agency during distinct administrations; and how these government communicators conceive of the standards and guidelines that exist and direct how social media messages should be constructed. Future research may thus gain fruitful insight by investigating the subjective and professional dimension of the individual communicators themselves, as well as the practices, policies and/or internal politics of their organizations that may influence characteristics of the discourse.
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APPENDIX A

This appendix A presents detailed information on the coding instructions for the speech acts and discursive features of the framework adopted in this study. The instructions are based on previous literature (Fairclough, 2003; Halliday & Matthiessen, 2004; Hemphill & Roback, 2014; Shaikh et al., 2010; Vosoughi & Roy, 2016) as well as decisions made during the initial coding and training process. Some decisions are made to highlight particular features of discourse, but mostly decisions are made to simplify the coding process and obtain more “objective” results, that is, results that could increase inter-coder reliability. Therefore, decisions for the coding instructions are based on what can be most explicitly observed in the vocabulary, expressions and syntax of the text itself. This also follows the intention of the framework to focus on more explicit features and mechanics of the written language.

Speech Acts

First, each clause of each message is analyzed for the speech act that it may refer to. A clause is determined by the use of three punctuation marks: a period, an exclamation point; and a question mark. Although this may be conceived differently (e.g. Halliday & Matthiessen, 2004) pieces of text separated by a colon or semicolon are considered part of the same clause here. Since a message may have multiple clauses, each message may be coded with multiple speech acts. However, each clause should only be determined for one speech act. Moreover, each message, if it contains 2 or more clauses with the same speech act, this speech act is coded only once. There is also a certain hierarchy in the coding of clauses. In particular, any clause is only coded as a representative if it is not determined to be any other speech act. Moreover, participatory requests gain prominence over other speech acts (in order to ensure these types of messages, important in the context of democratic participation, are revealed).
**Directive**

Directives refer to an order or command to carry out an action. Generally, clauses in imperative format, where the verb begins the clause in the imperative tense, are coded as directives. Statements that may insinuate or suggest a directive, but are not explicitly articulated as such are not coded in this category. Examples of directives include:

“Try the @ENERGYSTAR home energy yardstick to save”;

“Check out how far we’ve come!”

“Stop the mold!”

Statements, such as “We would like you do to something” are not considered directives. This is a binary variable. If a clause is determined as a directive it is not coded in any other category. It is only coded once per post.

**Question Prompt**

Question prompts are questions that do not seem to indicate that the user should explicitly express a response to the question. Question prompts are essentially distinguished from questions which seem to ask the user to provide a comment or participate in some policy discussion with the government, such as in policy comment periods. If the question seems to only serve to gain the attention of the user, or to attempt to identify a particular type of user, it is considered a question prompt. Usually these questions contain a question mark, but this may not always be the case. Understanding if a question is a question prompt or not may require looking at the subsequent clause. Examples of these questions include:

“Did you know that we have invested $1,000,000 in clean energy?”; or

“Did you bike to work today? See how you can help the climate here…”; or

“In a flood zone? Make sure you know how to properly disinfect your drinking water.”
This is a binary variable. If a clause is determined as a question prompt it is not coded in any other category. It is only coded once per post.

**Participatory request**

Participatory requests are clauses that refer to an explicit request, invite or question that provides a means for contacting or interacting with the government. Such a means for contacting the government may simply be directions for more information on how this contact may be performed. Participatory request may come in the format of any other speech act. For example, a clause that says: “Please help us find great candidates for this award” while pointing to a link, is technically a directive. However, *participatory requests gain precedence over any other speech act*. That is to say, if a clause seems to indicate that the agency is actually asking for user input, either as dialogue via social media or my providing input via other channels, it is considered a participatory request. Similarly to question prompts, it may be necessary to read the other clauses in the message to understand whether or not a question or request is indeed participatory. Examples of these include

- “Are you interested? Let us know here:…”,
- “Provide your opinion here”.
- “Let us know what you think about this policy by leaving a comment below”; or
- “Our Clean Power Plan comment period has been extended, so we can hear from you.”

This is a binary variable. If a clause is determined as a participatory request it is not coded in any other category. It is only coded once per post.

**Commissive**

Commissives are references to commitments, pledges or promises made. References to promises or commitments previously made are also included in this category. Moreover, statements about
the future outcome of some agency policy or program are also considered as a commissive here. The idea is that these statements explicitly identify what someone intends to do or implicate himself/herself in doing. Examples include:

“Our fuel standards will cut GHG emissions by approximately X metric tons”

“Administrator is dedicated to faithfully administering the law…”

“EPA’s commitment to broad outreach and engagement…”

This is a binary variable. If a clause is determined as a commissive it is not coded in any other category. It is only coded once per post.

**Expressive**

Expressives are statements that explicitly express a particular sentiment, including moral sentiments, such as feeling good, honored, proud, upset, glad, loyal, etc. This also includes “phatic expression”, such as “Congratulations”, “Happy Holidays”, “Thanks”, “Condolences”, which may be related to anniversaries, celebrations, death or other similar events. Examples include:

“Happy fourth of July!”

“We’re proud to support Iowans working to…”

“We welcome… We are pleased…”

“Congratulations to the EPA Award winners…”

This is a binary variable. If a clause is determined as an expressive it is not coded in any other category. It is only coded once per post.
Declarative

A declarative is a statement that declares or pronounces an action. The utterance itself creates the action that it is supposed to bring about. Not to be confused with announcements of previously declared decisions. These latter are not considered declarations here. Examples include:

“\(I/we\) hereby declare”,

“\(I/we\) pronounce…”, etc.

This is a binary variable. If a clause is determined as a declaration it is not coded in any other category. It is only coded once per post.

Representative

A representative is a description of a fact, person, thing, process or situation. At the level of clause, only code if clause is not any another speech act. Therefore, all other speech acts should be checked first. If a statement seems to insinuate a directive, commissive or some other speech, but it is not clear, you may code as a representative. Most clauses may fall into this category.

Examples include

: “Did you know that the agency was created in 1975?”

“Our proposal protects wetlands, streams, and …”

“Students from Oklahoma created an outdoor learning environment…”

“We’re working with local, state, & federal agencies to provide guidance…”

All other speech acts gain precedence over the representative. Therefore, this category should be coded last, if no other category is suitable. This is because all clauses are assumed as “representative” by default. This is a binary variable. If a clause is representative it is not coded in any other category. It is only coded once per post.
Information Representation

Some of the different ways that information may be presented in a message are also analyzed here. This set of categories below are each examined and coded for the whole message, and not for each individual clause. Moreover, the categories below are not mutually exclusive, although each is only coded once per message.

Actors

The actor of a message refers to an individual or organizational actor in the message, which may be either a subject or object of a clause. There are four distinct types of actors that each message will be assessed for, each of which is a separate binary classification.

(1) agency. This is coded as 1 if there is an explicit reference to the agency, an agency program, personnel or a reference to the pronouns “We” (as in “We the agency”). Examples include: EPA, EPASmartSector, Administration Pruitt, Administrator McCarthy, EPAer, “We”, etc. Otherwise coded as 0.

(2) government. This variable is coded as 1 if there is a reference to another federal government agency, program or personnel (e.g. ENERGY Department, POTUS, etc.). Otherwise coded as 0.

(3) external actor. This variable is coded as 1 if there is an explicit reference to relatively specific external actor, such as a non-profit organization, the mayor or politician. Examples include: “this EPA Gulf Guardian Award”, @MazdaUSA, @VolpeUSDOT, etc. Often these will include an @ symbol which refers to a specific Twitter account. Otherwise code as 0.

Topic terms

Each message will be coded for “topic terms”. Topic terms are words, mostly nouns, in message that define the topic or theme of the message. Avoid using adjective or verbs except when
important to understand the topic of the message. Do not use actor to reflect topic. May use combination of more general (e.g. climate change) with more specific (e.g. forest fires) terms to define topic terms. Use between 3 to 5 topic terms, where compounds are one (e.g. “climate change” is 1 term). If included within the text, and it particularly unique for defining the topic of the message, a hashtag may be used to reflect topic term. For example, the following message:

“A team of 12 students diverted over 4.25 tons of food from landfills and won a #PEYA award. Congratulations!”

May include the following topic terms: students, food, landfill, award

The intention is to obtain a mix of the different terms of the message. If a message is about pollution, there is no need to include all the terms about pollution, but to use varied terms across the message. Let’s observe another example:

“Great convo re: the importance of securing clean water downstream w/ @cleanh2oaction and @SenatorCardin at the Bladensburg Waterfront Park.

This post may include the following topic terms: convo, importance, clean water, Park

**Statistical information**

Statistical information are reference to statistical information in the form of percentages, averages, or rates. Examples include:

“the rate is at 3.9%”,

“1 in 7 people”,

“21,000 per year”,

“98% of all…”.

Does not include reference to only numbers (e.g. 5, 4500, 13, etc), such as in 112 people won an award. May include trends, e.g. “x is increasing”. Coded once as as binary at level of message.
Scientific and causal information

These are references to scientific or causal information. This may be a reference to a relationship between things, events or processes (e.g. “X causes Y”, “Z is likely due to”) but not for more vague causal claims. References to reports and scientific activity (e.g. “we are engaged in studying how…”, “this report shows that…” ) are also be coded here. Examples include:

“The three most common nutrients found in fertilizer are nitrogen, phosphorus, and potassium”

“Upstream pollution can have a huge impact on downstream water quality.”

“Every year asthma keeps kids out of school for 10.5+ million days. Here's how to help reduce asthma at your school”

This last example above is both statistical information, as well as scientific/causal. This is coded 1 for the whole message, 0 otherwise.

Identification

This last set of categories refer to the dimension that has been referred to as “identification”, which may also be thought of as positive and negative sentiment or evaluations. These categories are also evaluated at the level of the whole message, and they are not mutually exclusive. For example, a message may have both positive and negative content. However, each category is only coded once for each message.

Positive content

This category refers to the presence of words, expressions or terms in a message that would create positive sentiment on an average person. This is a type of “sentiment evaluation”. However, the message may not have an explicit sentiment described, but would create positive sentiment on an average person. For example, terms such as: “protect”, “save”, “smart”, are
considered as positive content. If there is a direct reduction of a negative, then the message is considered positive. For example: “prevent lead” is considered positive, because lead is a dangerous chemical being prevented. Other examples of message that contain positive content include:

“What can clean the air you breathe, lower your energy bill, and cool the air?”

“Learn how to control mosquitoes and protect yourself from bites”

“Drive smart. Improving your fuel economy prevents carbon pollution”

This is a binary category, coded only once for each message.

**Negative content**

This category refers to the presence of words, expressions or terms in a message that would create negative sentiment on an average person. This is a type of “sentiment evaluation”. However, the message may not have an explicit sentiment described, but would create negative sentiment on an average person. For example, terms such as: “pollution”, “danger”, “crime”, are considered as negative content. If there is a direct reduction of a negative, then the message is considered positive. However, if the terms are extensively separated in the clause (generally more than 3 words apart), the post may be considered as having both negative and positive content. For example:

“Keep safe! Learn how to properly disinfect drinking water after a flood or other natural disaster…”

The previous message is considered positive because of the terms “Keep safe” and “disinfect drinking water”. However, the terms “flood” and “natural disaster” are considered negative, and are not directly negated in the message. Therefore, this message is considered both positive and negative. Other examples of only negative include:
“Indoor air quality and thermal conditions can affect the health and performance of students and teachers.

“Our activities cause GHG emissions, like carbon pollution.”

“Children are more vulnerable because their bodies are developing and their behavior exposes them to chemicals”

This is a binary category, coded only once for each message.

**Positive or Negative Self-Evaluation**

This category refers to the presentation of the agency, in terms of positive or negative frame. Essentially, this category asks for you to code the message as having a positive presentation of the agency, a negative presentation of the agency, or as neutral/non-applicable. This category requires that there is an explicit reference to the agency, which would have been previously coded in the actor category. In some cases, the evaluation of the agency will be explicit, in other cases it is more implicit. These implicit cases are instances where the agency, its programs and/or personnel are associated with some positive activity or outcome. The following three examples below are considered positive self-presentation:

“Apply to our #PostDoc program & help us protect the environment & public health.”

“Our proposed Clean Power Plan will #ActOnClimate and protect the health of future generations.

“We continue to work closely w/federal, territory, & local partners as the Agency responds to the impact of #Maria”

The following are considered neutral presentation:

“Nigel Simon works on information management systems, budgets, and contracts.

“View fact sheets and more on the Clean Power Plan <link>”
APPENDIX B

Below is a list of the most frequent terms from both and each particular dataset that were removed from the list of most frequent terms shown in the Results Chapter, Section 7.4. The rationale for removing these terms is that they are overly generic, appear often or mostly appear in both datasets, and therefore did not help highlight the terms that are particular to each administration and the differences that exist across the two datasets.

<table>
<thead>
<tr>
<th>Terms present in both</th>
<th>Unique to the McCarthy dataset</th>
<th>Unique to the Pruitt dataset</th>
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</thead>
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<td>child</td>
<td>apply</td>
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<tr>
<td>award</td>
<td>environmental kid</td>
<td>home</td>
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<td>community</td>
<td>kid</td>
<td>program</td>
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<td>school</td>
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