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The Political Role of Social Media in Emerging Democracies

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Abstract

Information and communications technology (ICT) enables the emergence of new forms of media. One of these new forms is social media. The research literature suggests that the strengthening of the media as an independent institution is essential for social development because, in a regimen of a free press, the media can report and genuinely discuss the needs and problems of citizens and businesses. Although the purpose of the media in a democracy is to serve all members of society, the media may not perform this role well due to lack of freedom and political influence. In emerging democracies, pro-government media monopolies often act as powerful anti-democratic forces that prevent journalism from expressing critical views against the political class. However, social media creates opportunities for organizations that are critical of the government to raise their voices and communicate their views to the public. Hence, the purpose of this thesis is to develop a better understanding of the political role of social media in emerging democracies.

This thesis centers on the case study of a social tragedy in which 41 girls died as a consequence of a fire at a children's care home in Guatemala on March 08, 2017. The author collected digital trace data from Twitter disseminated in the aftermath of the tragedy and engaged in a mixed-method approach based on the interpretive case study method and social analytics. Social analytics is a subfield of data analytics that deals with the collection and analysis of interactions among people in online environments. This thesis contributes to the IS literature by explaining how different types of media organizations used Twitter to influence interpretations of the tragedy in the context of historical media censorship that characterizes emerging democracies like Guatemala.

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The Political Role of Social Media in Emerging Democracies

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Chapter 1. Introduction

The focus of this thesis is on the political role of social media in emerging democracies. Social media are technologies that allow for user-generated content, making it possible for users to create, share, and comment upon content generated by other users (Boyd and Ellison 2007). Through social media, anyone can easily create content that is publicly available to other users of social media. Such freedom for creating content with the potential to reach large audiences enables the emergence of prominent actors in society who can disseminate alternative views of events to the general public (Miranda et al. 2016; Vaast et al. 2017). Social media allow the emergence of independent media outlets, distinct from and not controlled by the previously existing traditional media.

This thesis uses a mixed-method approach based on the interpretive case study method (Klein and Myers 1999) and social analytics (Miranda 2018). Social analytics is a subfield of data analytics that deals with the collection, management, and analysis of “digital trace data” (Miranda 2018, p. 5). Digital trace data include profiles, interactions, and relationships among people in online environments. Social media are primary sources of digital trace data as well as news media coverage and conventional websites. Miranda (2018) classifies social analytics techniques into two major classes: (1) social network analysis (SNA) which is the study of who interacts with whom; and (2) text analysis which is the study of the contents of conversations and discussions, typically in textual formats. While SNA deals with the structural aspects of interactions over a network of communications, text analysis studies the content of those communications. Researchers have applied social analytics to understand a variety of economic, socio-political, and organizational phenomena (Miranda 2018). In this thesis, I applied diverse techniques of SNA and text analysis to study a tragic event related to the political role of social media in an emerging democracy.

Applications of social analytics to understand socio-political phenomena include the identification of influential actors and assertion of fault lines in society (Miranda 2018). The identification of prominent actors involves the definition of metrics for assessing and visualizing influence over a network of communications. The role of influential actors in socio-political phenomena is important because interpretations of reality and events are, in many cases, driven by popular media organizations who can reach, inform, and persuade many people in society.

The assertion of fault lines relates to the identification of aspects that cause division or dissent in a society based on one or more attributes, such as socioeconomic status and ideology. Social fault lines play an important role in a variety of socio-political phenomena because fault lines often lead to periods of social disruption. Furthermore, the identification and assessment of social fault lines lay the basis for understanding phenomena, such as social uprisings and social movements. Fault lines are largely dependent on the information that people access and share, how people interpret that information, and how the individuals interact with each other. Social media is likely to exacerbate the impact of fault lines on society when the use of social media expedites the expansion of fault lines involving large groups in society.

The application of social analytics techniques to obtain valuable insights requires a comprehensive understanding of the phenomenon under study. The phenomenon of study of this thesis is the political role of social media in emerging democracies with an emphasis on media organizations that rely exclusively on ICT for interacting with their audiences. The study of how information and communication technologies (ICTs) can strengthen state institutions is part of a broader topic that concerns the use of ICT for advancing social development. The literature in IS that discusses the contribution of ICT to social development draws on institutional perspectives for understanding the use of specific institutional players of ICT in the advancement of development goals (Walsham et al. 2007). Institutional perspectives highlight the importance of considering institutional structures to advance social development. Under this lens, the operation of a democratic state depends on the legislative and judiciary state institutions that define the structures for the functioning of the various service systems operated by government executives (Srivastava et al. 2016). The media is often regarded as an informal institution, serving as “a conscience keeper and influencing many actions of the state executives” (Srivastava et al. 2016, p. 513). These institutions provide the broad framework within which a nation’s activities are performed.

According to Walsham et al. (2007), IS studies that draw on institutional perspectives focus on the use of ICT by institutional actors such as the industry, government, and international organizations to advance development goals. However, most studies have focused on areas related to economic productivity, sustainable development, healthcare, and education. In the last years, IS scholars have begun to pay attention to new ways through which ICT can have a positive impact on society by opening spaces for public discourse and surfacing diverse perspectives that challenge the status quo in politics and society. Few studies have looked at the role of social media on the expansion of the media and the emergence of new types of media organizations that rely exclusively on the Internet for reaching their audiences. Miranda et al. (2016) suggest that future research may investigate to “what extent can social media relax structural constraints and content restrictions by permitting new voices and new frames?” (Miranda et al. 2016, p. 323).

This thesis is a response to this call. This thesis recognizes how ICT, specifically social media, enable the emergence of new media organizations free of government control. The strengthening of the media as an independent institution is essential for social development because, in a regimen of a free press, the media can report and genuinely discuss the needs and problems of citizens and businesses. An independent and efficient media is “able to impartially highlight the problems of citizens and businesses” (Srivastava et al. 2016, p. 521). According to Miranda et al. (2016), the media play the key societal functions of democratization and exposing the truth. The media serve a democratization function by opening spaces that allow rational exchanges of views and critiques from diverse actors in society. The media also serve to function of exposing the truth by investigating the actions of public authorities and revealing conditions which are at variance with public moralities. Through the societal functions of democratization and exposing the truth, independent media are essential in democratic regimes “as an institution that constitutes a viable base from which to stand up to the government and concentrated corporate power” (Miranda et al. 2016, p. A3). An independent media not only acts as the eyes and

ears of the government but also can highlight wrongdoings in the government, “thereby creating public opinion on the subject” (Srivastava et al. 2016, p. 515).

The aim of this thesis is to develop a better understanding of the political role of social media in emerging democracies. To develop this better understanding, I focus on the dissemination of content by media groups that rely on ICT, particularly social media, for reaching their audiences. Emerging democracies are countries that have recently restored democratic rule after control by a dictatorial regime established to provide interim leadership in times of civil war or social unrest. In many cases, these dictatorships were supposed to provide “political stability” during periods of civil war. This is the case of many countries in Latin America, Asia, and Africa. In these countries, long-standing dictatorships caused severe damage to the media by censoring views and stories that could challenge the legitimacy of those in power (Rockwell 2007). According to Rockwell (2007), in many cases, the transition from authoritarianism to democracy created conditions for the formation of powerful media monopolies. The establishment of these media monopolies happened at the expense of trading the media’s societal functions for roles amenable to the interests of power elites. However, in the last decade, I argue that the adoption of ICT in emerging democracies has changed the landscape for media monopolies and practices that have long suppressed critical views against political and business leaders.

This thesis centers on the case study of a social tragedy that took place in Guatemala. On March 07, 2017, in a care home operated by the Guatemalan government, 41 girls died because of a fire while they were protesting alleged abuses committed by their caregivers. The tragedy unleashed strong dissent in Guatemalan society against the government that manifested through social media and street protests. Recent social uprisings in Guatemala mediated by ICT against dysfunctional government institutions and corrupt practices by government executives have shed light on the battle for rescuing the media from its co-optation by information monopolies.

In view of the alternatives brought by ICT to access information when monopolies control traditional media (e.g., television and radio broadcasting), this thesis investigates the use of ICT for persuading and influencing people in their sense or understanding of the conditions surrounding the Guatemalan tragedy. The interpretation of the tragedy by diverse social actors exposed underlying strains in the Guatemalan society that exacerbated sentiments of dissent and rebellion against public authorities. Thus, the central question in this thesis is how can the sensegiving of a social tragedy through social media challenge the trust in public authorities.

To answer the research question, I conducted a case study of the social tragedy in Guatemala. I adopted the interpretive case study methodology (Klein and Myers 1999) and complement it with social analytics to analyze the Twitter communications that unfolded in the aftermath of the tragedy. The contribution of this thesis to the IS literature is a taxonomy of the content created through Twitter by different types of media organizations that influenced the public in their interpretation of the Guatemalan tragedy.

This thesis is organized as follows. Chapter 2 draws on Latin American studies to describe the historical and social context of this thesis. This chapter provides an overview of the political role of social media

in emerging democracies, its importance for the development of independent and critical media, and the events surrounding the Guatemalan social tragedy. Chapter 3 presents a review of the literature relevant for addressing the question of how can the sensegiving of a social tragedy through social media challenge the trust in public authorities. Chapter 4 discusses the challenges involved in the use of digital trace data for conducting qualitative research in IS and proposes a pragmatic approach to research methodology that mixes Klein and Myers (1999)'s case study method with social analytics. Chapter 5 discusses the findings and analysis. Finally, Chapters 6 and 7 discuss the contributions to the literature, conclusions, and limitations of this thesis.

Chapter 2. Research Context

The media is often regarded as an institution in democratic states along with the legislative, judiciary, and executive. A core function of the media is to identify dysfunctions in any of the other three institutions by exposing conditions that go against public morality (Miranda et al. 2016). In democratic regimes, the media constitute a “viable base from which to stand up to the government and concentrated corporate power” (Miranda et al. 2016, p. A3). They serve a democratization function (Miranda et al. 2016) by enabling spaces for the rational exchange of views about matters of public interest—views that are free from the control of public authorities and that can in principle be critical of the state (Habermas 1991).

Nonetheless, the reality of many emerging democracies is that the media are often subject to the question of whether they fulfil their public service or act as “lapdog of the power elite” (Blankson and Murphy 2012, p. 1). Emerging democracies are countries that have recently restored democratic rule after control by a dictatorial regime established to provide interim leadership in times of prolonged social unrest. Latin America is currently the site of many emerging democracies that have endured extremely violent and destabilizing intrastate conflicts or civil wars during the post-World War II (Hartzell 2000). Researches have examined Latin America's civil wars and transition to democracy to “better understand the institutional outcomes to which intrastate conflict give rise” (Hartzell 2000, p. 65).

Researchers, especially in the Latin American studies field, have studied the degeneration of the media as a state institution in post-civil war periods in Latin America. In the last decades, numerous governments in Latin America have forged mutually beneficial relationships with national media companies that paved the way for the development of strong media monopolies (Fox and Waisbord 2002). In many emerging democracies of Latin America, television and radio media often downplay the grievances and needs of socially marginalized people, instead of focusing on content aimed at dominant or popular groups. In Central America, monopolistic television industries have not only remained absent from the debate on government policy but also engaged in actions to crush views against government institutions or business elites (Rockwell and Janus 2001). In countries like Guatemala, Honduras, and El Salvador, power elites often receive criticism for “co-opting traditional media to perpetuate their interests and ignoring or misrepresenting perspectives that challenge their interests” (Ortiz et al. 2019).

This chapter provides an overview of the origins of media dysfunctions and the prevalence of powerful media monopolies and strict press censorship in media organizations in emerging democracies of Latin America. This chapter also presents the Guatemalan social tragedy in which 41 girls lost their lives and situates the tragedy in a context of media emancipation driven by the adoption of ICT in Guatemala.

2.1 The Evolution of the Media in Emerging Democracies of Latin America¹

Two parallel forces, local politics and the globalization of media markets, have shaped the development of Latin American media since the 1990s (Fox and Waisbord 2002). On the side of local politics, the military dictatorships that swept Latin America in the 1970s stimulated the growth of the media industry while exercising tight political control. In the early to mid-1980s, the replacement of military dictatorships by civilian rule marked the beginning of a fresh and promising democratic era. However, the much hoped-for transition to democracy did not bring genuine independence to the media as an institution. Government executives in many of the new democratic regimes forged mutually beneficial relationships with broadcasting industries that paved the way for the emergence of strong media monopolies.

During the 1990s, the globalizing push furthered the adoption of technological innovations that had a significant impact on the restructuring of the media industry (Fox and Waisbord 2002). The general evolution of technology and media industries in Latin America resulted in the rapid growth of radio and television, the rise of new forms of distribution of TV programming (cable and satellite), and the decline in newspaper readership. For media companies with ambitious domestic and global goals, having a solid position in the television industry was crucial: “over-the-air television receives the lion’s share of advertising revenue” (Fox and Waisbord 2002, p. 11).

Practices of clientelism deeply rooted since the days of military dictatorships and the widespread adoption of technology during the globalization process were the catalysts for a process of rapid concentration of information resources (Fox and Waisbord 2002). Today, Latin American governments may no longer own broadcasting stations, as in past decades of civil war and authoritarianism, but they are still able to influence the conditions under which media businesses operate. Domestic policies favoring media corporations and the enormous size of domestic markets explain why Mexico and Brazil today have the two largest, monopolistic, and politically powerful broadcasting industries in the Western Hemisphere.

The formation and prevalence of money-spinning media monopolies across Latin America occurred at the expense of trading their public service role for one that returned more profits (Fox and Waisbord 2002). Attempts at media policies by Latin American states were largely successful when motivated by the need for increased political control of the media but largely unsuccessful when motivated by considerations of public services and national culture (Waisbord 1995).

In Central America, media monopolies represent powerful anti-democratic forces that have prevented free expression from a multiplicity of viewpoints (Rockwell 2007). In contrast to Brazil and Mexico, regional media companies and foreign investors financed television monopolies and quasi-monopolies

¹ Work included in Ortiz, J. 2018. “Rescuing the Media in Emerging Democracies through ICT,” *Proceedings of the Australasian Conference on Information Systems (ACIS) 2018*.

in Central America (Fox and Waisbord 2002). The formation of these monopolistic television industries neglected a tradition of public service and an ethical path in strengthening democracy (Rockwell 2007).

In Guatemala, a broadcasting monopoly started with the acquisition of a television network in 1981 by a Mexican investor. During the 1990s, the Mexican mogul, following the scheme developed in Mexico of catering the political class, acquired all major television channels and a significant slice of the radio spectrum in Guatemala (Rockwell and Janus 2001). Since then, the commercial television monopoly in Guatemala has not only purged voices critical of the central government but also used to attack media outlets not aligned with government policies (Rockwell 2007).

The television monopoly and oppressing tactics developed during a brutal civil war fought between the Guatemalan government and leftist rebel groups created a culture of silence—a culture that prevented journalism in Guatemala from “criticizing the government, the army, or even some of the country’s leading businessmen” (Rockwell and Janus 2001, p. 497). Through the early 2000s, the television monopoly in Guatemala acted as a force that undermined the fundamental democratic practice of allowing journalists and others in society to counter government action through critical ideas offered through free and open discussion (Rockwell and Janus 2001).

Echoing the waves of social and political unrest unleashed by ICT at a global stage in the last decade, Internet-empowered societies in Latin America have also come together to protest impunity, negligence, and corruption practices in their governments. A novel characteristic that personifies this upsurge of political struggle is the decentralization of information resources. With the advancement of the Internet, new forms of activist-produced media have contributed to the mobilization of thousands of citizens in massive crowd protests across the region. In Guatemala for example, Twitter has been central for disseminating information and organizing people to protest in unprecedented demonstrations against corruption in the government (Harlow and Harp 2012; LeBrón 2009).

2.2 The Rise of New Media in Guatemala

In contrast to the post-civil war period of the 1990s where technological innovations contributed to the concentration of media ownership across Latin America, the adoption of ICT during the 2000s is changing the landscape for media monopolies. In recent years, the proliferation of ICT has created unprecedented opportunities for the emergence of new forms of media. New media organizations have found ICTs “to be inexpensive, powerful tools” for circumventing the limitations of traditional media (Lievrouw 2011, p. 2). ICTs provide a platform for surfacing points of view that would otherwise “be invisible, silenced, or squelched in general debate” (Ortiz et al. 2019). Certainly, the openness of public discourse represents a major societal challenge where ICTs can have a positive impact in emerging democracies like Guatemala.

ICTs are giving activist groups around the world a means through which they can make their voices heard. Through ICT, many social movements have been made possible, giving previously excluded people an opportunity to express their voice and coordinate their campaigns to spur change (Ortiz et al. 2019). In Guatemala, despite ongoing monopolistic practices and oppressing tactics to crush critical

views of those in power, ICT has become an alternative to renew the role of the media as watchdog on government institutions.

The emergence of new media enabled by ICT overlaps with a more complex ongoing process of social development in Guatemala focused on fighting impunity and human rights violations. Under the direction of international organizations, Guatemala is currently reforming its judiciary system to tackle widespread corruption and impunity in the government (HRW 2018). In this struggle, diverse actors have emerged in civil society who, concerned with the malfunctioning of government institutions, play the role of watchdog organizations critically monitoring the activities of the government. These organizations rely on ICT, especially social media, for alerting the public when they detect actions that go against the public interest. Undoubtedly, the gradual emergence of a well-informed citizenry in Guatemala, empowered by ICTs, has begun to forge a culture of zero tolerance towards corruption and negligence in the government.

The powerful media monopolies still exist, of course, but their dominance is no longer assured as it was during the 1990s, as the widespread adoption of the Internet creates unprecedented opportunities for expression in Guatemala. Activists, political, and cultural groups have found ICTs to be inexpensive, powerful tools for challenging the givens of anti-democratic monopolistic systems that have long dominated the Guatemalan media.

Among the challenges for creating spaces that enable discourses that can in principle be critical of the Guatemalan government, is a monopolized TV industry that frequently censors voices opposed to the government (Rockwell and Janus 2001). The political system has been strongly influenced by military forces and business elites that have fostered a climate of violence against independent journalism (HRW 2018; Rockwell and Janus 2001; The Intercept 2018). As a result, organizations that are critical of the government depend heavily on social media sites, such as Twitter and Facebook, for raising their voices and communicating their views and perspectives to the public.

2.3 Twitter in Guatemala

Twitter has enabled media groups and activists around the world with critical views of the status quo in society and politics to “circumvent real-world social barriers preventing information dissemination” (Benjamin et al. 2014). This is particularly important in situations where standard communication channels in society (e.g., television broadcasting) are silent on issues that could be seen as contrary to the interests of those in power (Oh et al. 2015). The appearance of Twitter in the political life in Guatemala dates to 2009, with the murder of a Guatemalan attorney for his investigation of a corruption case involving senior government officials. A video of the murdered attorney (that he made before he was killed) was released to the media and spread virally on YouTube, inciting widespread protests online and on the streets (LeBrón 2009). According to LeBrón (2009), Guatemalans leveraged Twitter technological features for disseminating information to make information about the case a trending topic, or “one of the most-tweeted about topics on the site.” In year 2009, Twitter was central for

organizing people to participate in massive demonstrations held against the government, termed as Guatemala's "Twitter-Revolution" (LeBrón 2009)

More recently, in 2015, an investigation carried out by an anti-corruption commission and State prosecutors in Guatemala disclosed a government conspiracy group dedicated to defrauding the customs service of millions of dollars (InSight Crime 2016). The public announcement of the investigation unleashed an unprecedented political upheaval in Guatemala that involved a series of crowd protests. These protests were organized and spurred on via social media websites. After a peaceful protest that mobilized more than 200,000 Guatemalans at the Plaza of the Constitution in Guatemala City, the Guatemalan president resigned on September 1, 2015.

Social media platforms like "Twitter, YouTube, and Facebook have allowed for the rapid transmission of information and created vital forums to express concern about the current political situation in which Guatemalans are enmeshed" (LeBrón 2009). These platforms have created unprecedented opportunities for many groups in Guatemala to express their views free of government control. For the first time since military dictatorships perpetrated a climate of terror that crushed mainstream dissent during the Guatemalan 36-year civil war, cross-sections of Guatemalan society have been able to come forward to "debate, share ideas, and protest under collective banners that deride and criticize authorities" (Lakhani 2009). From the attorney's pre-death tape that motivated massive demonstrations in 2009 to the political upheaval in 2016 that led to the resignation of the Guatemalan President, Twitter has been used as a platform for raising awareness on cases of corruption and impunity as well as a means of organizing mass protests to the government. These cases in the recent political history of Guatemala highlight Twitter as an important channel in Guatemala society for expressing political views that are critical of the government.

Table 2.1 provides statistics extracted from Hootsuite (2019)'s report about the use of Internet and social media in Guatemala as per January 2019 and highlights Facebook, Instagram, and Twitter as the most used social media sites in Guatemala. Table 2.1 gives a context of the current use of social media in Guatemala as per January 2019. Since the appearance of Twitter in Guatemalan's political history on 2009, several factors may have affected the use of Twitter in Guatemala, such as the appearance of new social media sites like Instagram. Instagram focuses on the creation and sharing of visual content and exhibits similar features to Twitter for disseminating information to large audiences. Facebook has also created new ways for users to interact among themselves facilitating one-sided relationships. These mechanisms are similar to the non-reciprocal feature for creating relationships in Twitter that facilitates the diffusion of information to a large number of people.

Table 2.1. Internet and social media use in Guatemala as per January 2019

Criteria	Statistic
Internet Use	
Total population	17.41 million
Total number of Internet users	7.8 million (45% of total population)
Social Media Use	
Total number of active social media users	7.8 million (45% of total population)
Monthly active users on Facebook	7.60 million (97% of total of Internet users)
Monthly active users on Instagram	1.60 million (21% of total of Internet users)
Monthly active users on Twitter	401.0 thousand (5% of total of Internet users)

Although Twitter has a smaller number of monthly active users compared with other social media platforms in Guatemala (see Table 2.1), Twitter remains an important communication tool in Guatemala. Some authors have emphasized the critical role of Twitter in the recent political history of Guatemala (e.g., LeBrón (2009) and The Intercept (2018)). In this fashion, Twitter functioned as a critical communication channel to disseminate information about the Guatemalan social tragedy in 2017 described in the next section. Future research could look at the political role of the most recent social media platforms like Instagram that focus more on the visual aspects of social media-mediated communications.

2.4 The Guatemalan Tragedy

The home known as *Virgen de la Asunción* was a care home operated by the government for the protection of children under the age of 18 who had suffered abuse or had been abandoned by their families. On March 07, 2017, about 60 children escaped after a riot broke out at the center against alleged ill-treatment by the caregivers (The New Yorker 2017). Several hours later, police officers managed to bring the escaped children back to the shelter. On the morning of March 08, the guardians of the shelter decided to lock the protesting girls in a small classroom in the home (The New Yorker 2017). Chaos erupted when a fire originated inside the room, and the girls found themselves trapped inside. Reports by the Guatemalan's national police said the fire started when the girls inside the room burned mats as a means of protesting (BBC News 2017). As consequence of the fire, 19 girls perished immediately in the care home, and several more died in the coming days as consequence of high-degree burns. In total, 41 girls lost their lives as result of the fire.

The tragic incident instigated deep feelings of dissent in the general population since the victims were all girls aged between 14 and 17 years old. During the aftermath, uncertainty was high as stories from diverse sources pointed out an array of factors surrounding the tragedy including reports of child abuse in the care home, the prosecution of government officials, and the sorrow of the victims' families. In the aftermath of the tragedy, there was much discussion about the fire on social media as many people turned to social media channels to express their opinions, feelings, and anger at the tragedy. Initial reports attempting to make sense of the situation emerged in the Twittersphere only a few minutes after

the event. The stories, authored by different media organizations, pointed out an array of antecedents and factors surrounding the tragedy. In the Twittersphere, stories soon emerged identifying the girls as victims of injustice. These stories accused government officials as being those most to blame for the tragic incident. Stories focusing on the victims and culprits were amplified with the aid of visual content (e.g., video clips and pictures) and “Twitter’s grammar” (Oh et al. 2015, p. 213) of hashtags and retweets. Diverse groups from the civil society including social movement organizations, activists, and university groups leveraged Twitter’s technical capabilities to create content that provided a resonant interpretation of the tragic incident.

The creation and dissemination of content in social media contributed to escalating the incident at the care home into a legitimization crisis for the government. A legitimization crisis happens when the citizens withdraw their support from public authorities and replace it with a questioning of current institutions (Pearson and Clair 1998). The repeated creation and diffusion of messages accusing public authorities of being responsible for the death of the girls funneled feelings of dissent among Guatemalan citizens that spurred massive protests to the government. The tragedy motivated a movement that unified and mobilized thousands of Guatemalans into a single cause—bring the perpetrators of the tragedy to justice.

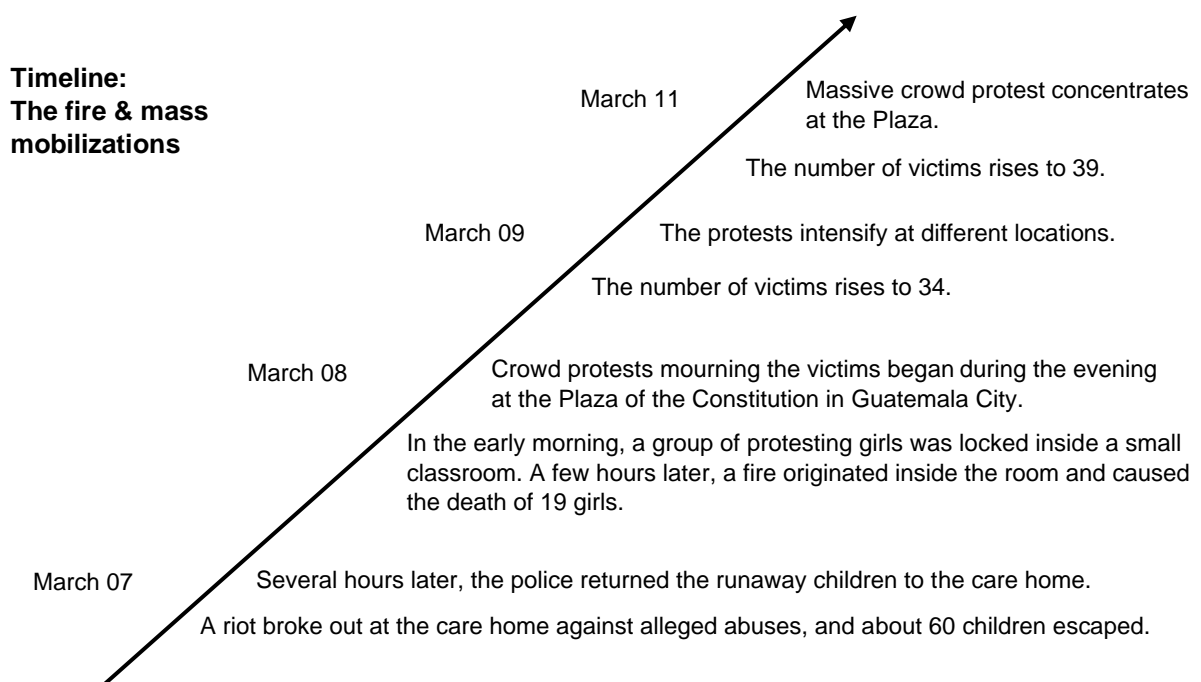


Figure 2.1. Events related to the Guatemalan social tragedy

In the following days, the tragedy inspired the mobilization of thousands of Guatemalans in several crowd protests. The crowd protests lasted a few weeks targeting the Guatemalan government and asking for the resignation of the Guatemalan president. Beyond the crowd protests, the tragedy inspired different groups in society to take actions aimed at identifying the causes of the tragedy, and ensuring

that any wrongdoing committed in the care home must not go unpunished. Figure 2.1 above presents a visualization of the events related to the tragedy.

Chapter 3. Literature Review

3.1 Social Tragedies

Drawing on Pearson and Clair (1998) social-political views on crisis, a social tragedy is a social disruption that results from breakdowns or strains in the standard way of living during which people perceive reality to be different from their expectations (Pearson and Clair 1998). A natural disaster, mass shooting, terrorist attack, or a murder—whatever the incident that is viewed as the social tragedy—causes the current state of the world to be perceived differently from the expected state of the world (Pearson and Clair 1998; Turner 1976). The term “social tragedy” used in this thesis for referring to a breakdown in the standard way of living differs from the term “crisis” in the emphasis on social norms. The term social tragedy emphasizes a disruption of values and norms in society whereas the term social crisis emphasizes “decision-making under uncertainty and time constraints” (Oh et al. 2013, p. 408).

The aftermath of a social tragedy involves a meltdown of commonly held values and norms that has the potential to bring together many people in their efforts to make sense of the situation. Group behavior in the aftermath of tragic events represent efforts of collective action in which many people respond “to a common influence or stimuli” (Kendall 2012, p. 598). Collective action refers to action taken together by a group of people whose goal is to achieve a common objective (Kendall 2012). The literature on the use of social media for organizing collective action stresses the capabilities of social media technologies for enabling fast communications in unpredictable situations. This literature highlights the features of social media services for connecting people and broadcasting information as efficient means for organizing collective responses. For example, new forms of organizing collective action enabled by social media include formulating mechanisms that allow communities to respond more efficiently to natural hazards events (Shklovski et al. 2010; Starbird and Palen 2010; Zammuto et al. 2007). During the aftermath of Hurricane Katrina, mobile devices and social media services enabled people to report and find missing persons (Shklovski et al. 2010), and connect people needing jobs with companies offering repair work (Zammuto et al. 2007).

Furthermore, social tragedies often involve high informational uncertainty where causes and effects are unknown (Pearson and Clair 1998) or prone to multiple interpretations (Oh et al. 2013). Thus, efforts of individuals for reducing informational uncertainty are instances of social-media-enabled collective action in the aftermath of tragic events. For example, during terrorist attacks, people have used social media for raising situational awareness by sharing reports from local eyewitnesses (Oh et al. 2013).

However, as social media becomes a source of news created by the collective efforts of the general public, concerns have been raised about the reliability of the information shared (Oh et al. 2013; Schifferes et al. 2014). Oh et al. (2013) addressed the issue of information quality in social media by identifying factors that cause the propagation of rumors in Twitter networks. Schifferes et al. (2014) propose a method for verifying the veracity of information in social media by constructing and maintaining a list of influential or reliable sources that are more likely to provide veracious news reports.

In studies of social media in the aftermath of disrupting events, collective action tends to be short-lived and driven by external influence or stimuli. Consensus exists in this literature that when people can communicate quickly and easily with one another, efforts at organizing a collective response are more likely to be successful. This literature leans towards the conceptualization of breakdowns in the standard way of living as social crises—shedding light on the efficiency and pitfalls of social media for mediating collective communication and facilitating collective action during periods of social disruption.

In the context of political upheavals, crowd protests are examples of mass behavior that demand radical changes in short periods of time. In these cases, the incidence of tragic events can exacerbate deep feelings of dissent, perceptions of fraudulent democracy or negligent governance (Harris 2006; Howard et al. 2011). In these cases, the success of organizing mass mobilizations depends on reaching and coordinating a large number of “like-minded people” that share the same values and norms (Kendall 2012, p. 600). Furthermore, the literature on social movements has advanced the notion of sensemaking as a different perspective for understanding breakdowns of social values and norms and their consequences to society. Following this stream of literature, this thesis builds on extant literature on sensemaking to explain how in the aftermath of a social tragedy, diverse actors in society use social media to influence the sensemaking of the tragedy.

3.2 Sensemaking

In the Guatemalan tragedy that I focus on, the girls died because of what Weick (1993) calls a breakdown in role structure in the government-run care home. The caregivers responsible for operating the center lost all structure (i.e., guidelines that define how the care home should run) and were unable to do anything that would have saved the lives of the girls. Consequently, the death of teenage girls under the tutelage of a public institution represented a breakdown with the traditional values and norms commonly held in Guatemalan society.

Researchers have conceptualized the coping of social disruption as the outcome of communicative behaviors that take place during processes of “sensemaking” (Aguirre et al. 1998; Mills 2003; Turner and Killian 1987; Weick et al. 2005). Under this perspective, social tragedies involve joint communicational efforts that construct and expand the shared understanding of a controversial or conflictive situation. Furthermore, researchers (e.g., Gioia and Chittipeddi (1991), (Weick et al. 2005), Fiss and Zajac (2006), and Smerek (2011)) argue that sensemaking needs to be complemented by “sensegiving”, the process by which meanings are framed and directed to an audience (Fiss and Zajac 2006). In words of Weick et al. (2005), “sensemaking is incomplete unless there is sensegiving” (p. 416), a complement to sensemaking undertaken to “create meanings for a target audience” (p. 416). The motivation for complementing sensemaking with sensegiving is the realization that the framing of stories and interpretive schemes in understandable and evocative terms, provides the guidance for driving “action toward incipient change, and exerting influence to accomplish it” (Gioia and Chittipeddi 1991, p. 446). Hence, I draw on the concept of sensegiving as a component of sensemaking theory to describe processes of meaning dissemination and framing that unfolded in the aftermath of the Guatemalan social tragedy.

The literature has discussed the notion of sensemaking to explain human behavior during periods of breakdown and social disruption (Aguirre et al. 1998; Turner and Killian 1987; Weick 1993). The study of sensemaking allows us to explore “the basic framework of understanding available in our society for making sense of events” (Kendall 2012, p. 614). Sensemaking is the process in which breakdowns or strains on the standard way of living drive people to search for meanings to make sense of reality (Weick et al. 2005). Efforts at sensemaking occur “whenever the current state of the world is perceived to be different from the expected state of the world” (Weick et al. 2005, p. 414). Whether in the context of formal organizations or at a broader societal level, the motivation for studying sensemaking stems from the inquiry into factors that precede and determine human action.

3.2.1 The Process of Sensemaking

According to Weick et al. (2005), when the course of reality feels different from what it should be, people first seek to construct a plausible sense to resume any interrupted activity, or if necessary, create a course of action to resolve the discrepancies and normalize the breach. In Weick et al. (2005)’s conceptualization of sensemaking, sensemaking starts with chaos or ecological change. Discrepancies and equivocality in ongoing circumstances trigger an early state of sensemaking called enactment. In this phase, people concerned with the current flow of events engage in the production of new meanings or interpretations for something that has already occurred. The phase of enactment describes initial endeavors for the construction of meaning marked by attempts for turning circumstances into a situation that can be comprehended explicitly in words.

Activities of enactment may result in data that can mean several things. The number of possible meanings then gets reduced in the phase of selection. As sensemaking unfolds, communication takes place in the form of interactions by which stories are made more explicit and usable. During these exchanges, people evaluate different perspectives while identifying an account of the situation that would align with their values and norms. What is especially interesting here is that people try to “make sense of how other people make sense of things” (Weick et al. 2005, p. 413). As a result, a combination of attention and mental models based on life experience and normative frameworks perform a reduction of the produced material in the early phase of enactment that generates plausible stories.

Stories gain further solidity in the phase of retention. When a plausible story is retained, it tends to become more substantial because it connects to “identity,” relates to experience, and is used “as a source of guidance for further action and interpretation” (Weick et al. 2005, p. 414). Through the phases of enactment, selection, and retention, the aim of the sensemaking process is to render events meaningful and thereby organize experience and guide action.

Weick’s model known as the enactment-selection-retention (ESR) sequence draws on enactment theory from Jennings and Greenwood (2003) to explain sensemaking as a process of organizing in the context of formal organizations. The fundamental process described by Weick’s model can be used as the foundation for studies looking at sensemaking at a broader macro-level concerning economic and political forces. In words of Weick et al. (2005), “the beauty of making ESR the microfoundation of

organizing and sensemaking is that it makes it easier to work with other meso- and macro-level formulations” (p. 414).

In the ESR sequence described above, the aspects of plausibility and identity are the two basic properties that characterize sensemaking and “differentiate it from basic cognitive psychology” (Weick 1995, p. 416). In the following subsections, I describe the sensemaking properties of plausibility and identity.

3.2.2 Plausibility

“Sensemaking is not about truth and getting it right” (Weick et al. 2005, p. 415). Instead, it is about the crafting of a comprehensive story that incorporates and frames elements of reality (Weick et al. 2005). According to Weick et al. (2005), in a study of culture change by Mills (2003), the author found that stories tend to be seen as plausible “when they tap into an ongoing sense of current climate, are consistent with other data, reduce equivocality, provide an aura of accuracy, and offer a potentially exciting future” Mills (2003, p. 169). According to Weick et al. (2005), the idea that “sensemaking is driven by plausibility rather than accuracy” (p. 415) agrees with studies in the management literature asserting that a key problem for organizations is not to accurately assess data, but to “appropriately interpret and act on the flood of information” (Bettis and Prahalad 1995).

Stories reflecting “inaccurate perceptions are not necessarily a bad thing” (Weick et al. 2005, p. 415). According to Weick et al. (2005), studies in the management literature rarely assert that the accuracy of managers’ perceptions determine the effectiveness of their decisions and actions. In an article by Mezas and Starbuck (2003), the authors discuss the results of their longitudinal study of managerial perceptions in some of the world’s leading companies at the time. Interestingly, the authors concluded that “most problem solving, possibly almost all problem solving, does not depend on accurate knowledge of current situations” (p. 15). In most situations, “people can act effectively without having accurate perceptions: they need only pursue general, long-term goals” (p. 15).

Action-taking enable people to assess “beliefs that subsequently lead to new actions undertaken to test the newly asserted relationships” (Weick et al. 2005, p. 415). Because people usually get prompt evidence about the outcome of their actions, “their misperceptions cause only small errors” (Mezas and Starbuck 2003, p. 15). The idea that the generation of plausible stories at the expense of possible inaccurate perceptions is operant and effective in the functioning of an organization is illustrated in the following excerpt from Mezas and Starbuck (2003, p. 15)’s study:

The managers’ ability to improve product quality depends hardly at all on their knowledge of current quality measures. The managers mainly need to accept the idea that they should improve quality. There are many actions they can take that are likely to produce improvements, and it does not matter that they choose the actions that offer the greatest improvements. If a controversy develops that measurements might resolve, such as which aspects of quality are most deficient, the managers can then make measurements or examine measurements that already exist.

The significance of plausibility in sensemaking lies in the interpretability of plausible stories to enable individuals to engage in further action. The important message here is that “if plausible stories keep things moving, they are salutary” (Weick et al. 2005, p. 415). Plausible stories pave the way for action-taking, which in turn, creates new opportunities for dialogue and persuasion that enriches the sense of what is going on. “Over time, as supporting evidence mounts, significant changes in beliefs and actions evolve” (Weick et al. 2005, p. 415).

3.2.3 Identity

Weick et al. (2005) argues that “stakes in sensemaking are high when issues of identity are involved.” Identity refers to the understanding of “who we are” (Weick et al. 2005, p. 416). Identity is “at the root of sensemaking and influences how other aspects, or properties of the sensemaking process are understood” (Mills 2003, p. 55). In the incidence of events that disrupt norms and values commonly held in society, such disruption “often translates into questions such as who are we, what are we doing, what matters, and why does it matter?” Weick et al. (2005, p. 416). As Coopey et al. (1997, p. 312), cited in Weick et al. (2005)note,

Faced with events that disrupt normal expectations and, hence, the efficacy of established patterns of meaning and associated behavior, individuals attempt to make sense of ambiguous stimuli in ways that respond to their own identity needs. They can draw creatively on their memory—especially their personal experience—in composing a story that begins to make sense of what is happening while potentially enhancing their feelings of self-esteem and self-efficacy. The story is a sufficiently plausible account of “what is happening out there?” that it can serve as a landscape within which they and others might be able to make commitments and to act in ways that serve to establish new meanings and new patterns of behavior.

As mentioned earlier in the description of the ESR sequence, plausible stories become more substantial because they connect to the identity and relate to experience. The sensemaking property of identity speaks to a combination of attention and mental models based on life experience and social norms that explain how individuals make sense and respond to equivocal inputs (Weick et al. 2005). In a nutshell, the capacity of a plausible story to reflect the beliefs, values, and experiences of individuals affect significantly how the story serves as a source of guidance for further action.

3.3 Sensegiving

Studies on sensemaking generally focus on how people cope with uncertainty and how their interpretations of an unexpected event lead them to take different actions (Oh et al. 2015; Weick 1988; Weick 1995). Plausible stories that connect with people’s identity and relate to their experience are more likely to guide further action. Closely related to the concept of sensemaking is sensegiving. As Weick points out, “sensemaking is not complete unless there is sensegiving” (Weick et al. 2005, p. 416). Complementary to sensemaking, sensegiving focuses on how actors persuade and influence people in their handling of uncertain and equivocal situations (Gioia and Chittipeddi 1991). “If sensemaking is

about how people come to construct meaning, then sensegiving is intentionally trying to influence how other people attribute meaning” (Smerek 2011, p. 81). Sensegiving intends to provide a viable interpretation of reality and influence targets to adopt it as their own (Gioia and Chittipeddi 1991).

According to Weick et al. (2005), Gioia and Chittipeddi (1991) set the stage for the study of sensegiving in their early finding that “sensemaking is incomplete unless there is sensegiving” (p. 416). Since the original conceptualization of sensegiving by Gioia and Chittipeddi (1991), the term has been primarily used in the management literature to describe the persuasion of an audience to engage with initiatives of organizational change (Smerek 2011). Sensegiving focuses on the outward communicative agency of individuals (Smerek 2011).

The motivation behind Gioia and Chittipeddi (1991)’s research on sensegiving comes from the inquiry into how altering the current way of thinking enabled an organization in the higher education sector to undergo changes in the ways they acted and operated. Gioia and Chittipeddi (1991) recognized that while sensemaking was important for developing a meaningful understanding of the intended changes, sensegiving was also essential for influencing the understanding of others “toward a preferred redefinition of organizational reality” (p. 442). In this fashion, Gioia and Chittipeddi (1991)’s main contribution to the literature is the notion that sensemaking and sensegiving are intertwined in a cycle corresponding to periods dominated by understanding and influencing. In their study, top management members first “tried to figure out and ascribe meaning to strategy relevant changes” (p. 443), and then, to “construct and disseminate a vision that stakeholders and constituents could be influenced to comprehend, accept and act upon to desire changes” (p. 443).

Building on the original conceptualization of sensemaking and sensegiving by Gioia and Chittipeddi (1991), researchers have adapted and advanced the notion of sensegiving in different contexts. For example, Rouleau (2005), studied the interpretation and promotion of organizational change in the context of a clothing company through the lens of sensemaking and sensegiving at the middle-management level. Rouleau (2005)’s explained the role of middle managers in interpreting, justifying, and promoting change to different stakeholders, in particular the business clients. In a later study by Rouleau and Balogun (2011), the authors studied sensemaking and sensegiving as discursive activities in the context of a Canadian radio broadcasting corporation. The authors focused on the use of language used by middle managers containing identity elements related to beliefs, values, and norms to construct an understanding of the sociocultural systems in the organization. Rouleau and Balogun (2011)’s contribution helps to explain how sociocultural elements embedded in spoken communication shape sensemaking and sensegiving—a practice that according to their study, facilitated the inclusion of “people from different organizational levels into the change as they go about their day-to-day work” (p. 953).

Further studies have also emphasized the interplay between sensemaking and sensegiving. For example, Klein and Eckhaus (2017) delved into the interplay between sensemaking and sensegiving through the analysis of language used in emails exchanged between senior and non-senior staff of a

major company in the energy sector while it went bankrupt. Klein and Eckhaus (2017)'s study shed light into the development of sensegiving through discursive tactics used by the management team to alleviate the surfacing of distressing thoughts in the company's employees during the bankruptcy.

Klein and Eckhaus (2017) applied a novel computational approach to investigate sensegiving using digital trace data from thousands of email communications. Klein and Eckhaus (2017) applied a "quantitative technique based on new software code" (p. 241) to capture sensegiving in "a corpus of more than 86,000 emails sent by employees" (p. 241) during the crisis triggered by the bankruptcy event. In this fashion, Klein and Eckhaus (2017) focused on "specific linguistic choices and word selection" (p. 233) used by senior staff to describe processes of sensegiving during the organizational crisis. To meet the challenges of identifying sensegiving in a large corpus, the authors applied a computational text analysis approach for classifying the emails in their data into distinct themes. Klein and Eckhaus (2017) then identified different forms of sensegiving based on the themes generated from their computer-based classification analysis. Klein and Eckhaus (2017) conclude their study by suggesting the use of "mixed methods, both qualitative and quantitative," (p. 241) to study sensegiving in the aftermath of turbulent events as it happens "in real-time, instead of through retrospective interviews" (p. 241). Their recommendation provides some justification for the mixed-methods approach used in this thesis (see chapter 4).

The studies mentioned above regard sensegiving as an intentional effort to persuade others, suggesting that the sender deliberately engages in the production of meaning for a target audience. Several other studies (e.g., Smerek (2011), Gioia (2008), and Fiss and Zajac (2006)) have proposed to understand sensegiving as a process of framing. In this line of research, Fiss and Zajac (2006) argue that sensegiving is a process by which change is framed and disseminated to an audience. In the next subsection, I describe in more detail the understanding of sensegiving as a framing process as proposed by Fiss and Zajac (2006).

3.3.1 Sensegiving via Framing

Fiss and Zajac (2006)'s motivation to integrate sensegiving with framing builds on the idea that to successfully persuade an audience and exert change there, it is necessary to "create and legitimate the meaning" of change (Fiss and Zajac 2006, p. 1174). Thus, to better understand how the legitimation of meaning play out, Fiss and Zajac (2006) suggest connecting sensegiving with the framing perspective from the social movement literature (Benford and Snow 2000; Snow and Benford 1988). In particular, Fiss and Zajac (2006) focus on Benford and Snow (2000)'s social movement framing theory, which moves beyond the formulation of meaning of change "to cover the mobilization for and legitimation of" change (Fiss and Zajac 2006, p. 1174).

The concept of framing provides an "attractive approach for understanding the process of sensegiving, particularly when such change may be highly controversial" (Fiss and Zajac 2006, p. 1174). By framing change, and thereby articulating a specific version of reality, organizations may secure "both the understanding and support of key stakeholders for their new strategic orientation" ((Benford 1993) cited

in Fiss and Zajac (2006, p. 1174)). Fiss and Zajac (2006) draw on Benford and Snow (2000)'s framing theory to explain how German firms pursued strategic shifts in their operations by framing change in two different framing approaches or frames. The following excerpt from Fiss and Zajac (2006, pp. 1175-1176) describes the classification of strategic responses to institutional processes as two distinct types of frames:

Acquiescence frames. An acquiescence frame implies that an organization is consciously obedient to norms and institutional processes (Oliver 1991). Regarding a shareholder value orientation, use of this frame means a firm publicly expresses its acquiescence to the globally diffusing "standard" model of shareholder-oriented governance (Kraakman and Hansmann 2001). Indeed, in using an acquiescence frame, the firm shows it is eager to demonstrate its compliance with a moral order that places the demands of shareholders first.

Balancing frames. However, not all corporations resorted to an acquiescence framing that indicated full compliance with a strategy of placing shareholders first. Instead, many firms deviated from the "standard" model by resorting to a balancing frame, seeking to accommodate the diverging interests of different constituent.

Fiss and Zajac (2006)'s study highlights the understanding of sensegiving as the creation and dissemination of different types of frames, which can be explained using framing theory from the social movements literature. At the same time, the concept of framing implies that the meaning of events may make for differing experiences of the same data, since frames imply boundaries that reveal certain aspects while keeping others out of sight (Williams and Benford 2000). A focus on the framing of actions, thus, highlights the inherently political nature of meaning construction and presentation (Hensmans 2003).

Seen in this light, I argue that communications in the aftermath of the Guatemalan social tragedy involved a macro-level process of sensegiving where diverse social actors used social media to present information with the intent to influence the sense or interpretation given by the public to the tragedy. The motivation for using sensegiving to describe the social media communications that unfolded in the aftermath of the tragedy comes from the nature of the tragedy as an unexpected event that involved a breakdown of commonly held values and norms in society. Following Fiss and Zajac (2006)'s perspective on sensegiving via framing, I drew on Benford and Snow (2000)'s framing theory to study the sensegiving of the Guatemalan tragedy by different actors in Guatemalan society. In the next section, I discuss Benford and Snow (2000)'s framing theory, which alongside sensemaking theory, provide the basis for the analysis of the Twitter communications that unfolded in the aftermath of the Guatemalan tragedy.

3.4 Framing Theory

The literature on social movements has examined the organizing of crowd protests as efforts of collective action aimed at promoting causes of social change. Sociologists define social movements as

organized groups that act to promote or resist change through collective action (Staggenborg 2011). In social movements, instances of collective action, such as crowd protests, occur during “cycles of mobilization” (Kendall 2012, p. 608).

Social media is a resource that social movement organizations (SMOs) can use for raising awareness and creating new forms of interaction with a broader audience. This view echoes resource mobilization theory, which is “one of the most common theories in the social movement literature” (Staggenborg 2011, p. 13). Resource mobilization theory (RMT) emphasizes the importance of resource acquisition by social movements for driving social change (Klandermans and Staggenborg 2002). RMT asserts that the rise and success of social movements depend on the acquisition of resources by actors who engage with the causes of the movement through formal organization (McCarthy and Zald 1977; Tilly 1978). During cycles of mobilization, highly organized groups rely on strategies and structures for gaining access to resources (Tilly 1978), increasing the readiness of movements to act collectively (Edwards and McCarthy 2004). RMT identifies “persistence and legitimacy” (Selander and Jarvenpaa 2016, p. 334) as highly salient characteristics of actions a group can take when using social media or other digital technologies to advance their causes.

For example, Leong et al. (2015) studied how grassroots movements rely on online social networks as a resource to mobilize members of communities by raising environmental awareness and protesting against a polluting industry. Selander and Jarvenpaa (2016) conducted an in-depth qualitative study to explicate how Amnesty International leverages digital technologies for creating new forms of interaction that deepen the involvement of its followers. Zheng and Yu (2016) explored the use of microblogging services in collective action from the perspective of a small group of activists promoting a program to alleviate malnutrition in impoverished communities in China.

Studies drawing on RMT shed light on explaining the complex dynamics of movements that need to survive for long periods in their endeavors for social change. Formal organization, bureaucratic structures, and clear strategies are essential for these movements to endure the challenges of transforming societies (Staggenborg 2011). This literature shows the value of social media in improving the organizational capabilities of these groups to maximize their impact on society.

Critics for RMT argue that it fails to explain how groups with limited resources can succeed in bringing social change (Kendall 2012). According to Kendall (2012), a key limitation of RMT is that it fails to acknowledge grievances, identity, and culture as well as many macro-sociological issues involved in the efforts taken by the civil society and grassroots movements to promote causes of social change. As a response, the literature of social movements has turned to alternative characterizations of social movements and their success. Scholars have regarded framing theory, alongside RMT, as a fundamental theory in “understanding the character and course of social movements” (Benford and Snow 2000, p. 611).

Framing theory (Benford and Snow 2000) contributes to “understanding how the use of digital media can produce and diffuse meanings that promote consensus about facets of problems to be addressed and specific solutions to pursue and motivational calls to action” (Ortiz et al. 2019). According to Ortiz

et al. (2019), in an IS context, social movement framing theory tells us that ICT tools can be used in the production of social change culture through diffusion of social movement frames and tactics. Social movement framing theory is also widely used by IS scholars studying the role of ICT in social movements (e.g., Barrett et al. (2013); Etudo (2017); Kim and Miranda (2011); Miranda et al. (2016); Young (2018)).

3.4.1 Framing Tasks

Benford and Snow (2000)'s framing theory centers on the concept of frames. A frame is a "device for organizing material that emphasizes some aspects of an issue and downplays or ignore others" (Miranda et al. 2016, p. 307). Benford and Snow (2000) identify three framing tasks involved in the production of frames. Diagnostic framing refers to making attributions regarding who or what is to blame, prognostic framing is about articulating a solution to the problem, and motivational framing is about engaging others in ameliorative collective action. Echoing Weick et al. (2005)'s sensemaking property of identity, stories become more oriented to action by connecting to significant identities and experience. It is well known in the literature that the identification of culpable agents in problematic situations is essential for organizing a response that seeks to remedy the situation (Benford and Snow 2000; Ferree and Miller 1985; Turner and Killian 1987). Through different frames, diverse social actors interpret events as the result of actions perpetrated by an unjust authority (Gamson et al. 1982). In this way, social movement actors seek to delineate the boundaries between "good" and "evil" by constructing movement protagonists and antagonists.

3.4.2 Frame Resonance

A critical issue in the production of frames is the capacity of the frame to be effective or "resonate" with the public (Benford and Snow 2000, p. 619). Snow and Benford (1988) introduced the term "frame resonance" to account for the ability of a frame to resonate or appeal to a targeted audience. Frame resonance intends to elucidate the conditions under which "framing efforts strike a responsive chord or resonate with the targets of mobilization" (Snow and Benford 1988, p. 198).

A determinant factor of frame resonance is the credibility of the frame or its capacity to find common ground in the public by generating a locally plausible story. This refers to the apparent fit between the frames and the events (Benford and Snow 2000). The matter here is not whether the stories are actually factual or valid, but whether "is there something out there that can be pointed to as evidence of the claim embedded in the framing?" (Benford and Snow 2000, p. 620). The more believable the empirical evidence supporting the framing, "the more credible the framing and the broader its appeal" (Benford and Snow 2000, p. 620).

In addition to empirical credibility, researchers have identified two factors that affect frame resonance: centrality and experiential commensurability (Benford and Snow 2000; Donovan 1995; Snow and Benford 1988; Zuo and Benford 1995).

Centrality is about how evocative are the frames with the beliefs and values of the public. Research on values and beliefs indicate that individuals routinely hold numerous values arrayed hierarchically according to the intensity with which they are held (Rokeach 1973; Snow and Benford 1988). For example, in the United States of America during the early twentieth century, the ability of the Woman's Christian Temperance Union (WCTU) organization to frame the alcohol problem as a moral issue granted them greater success over their competitors in securing financial support (Donovan 1995). Organizations competing with the WCTU diagnosed the alcohol problem in institutional terms, contending that the origin of the problem was the lack of legislative action prohibiting the commercialization and consumption of alcohol. In contrast, the focus of the WCTU was broader, attributing the problem also to self-indulgence and the moral failing of the individual. The aim of the WCTU was to "work definitely for the creation of a better informed citizenry which feels the obligation to make this a nation whose God is the Lord" (Donovan 1995, p. 148). The causes promoted by the WCTU centered at religious morality and the reformation of personal habits had higher hierarchical salience with the values and beliefs of the American people at that time. In the end, the rhetorical strategies of the WCTU allowed it to endure the grim economic conditions of the early 1930s unlike its competitors that went bankrupt (Donovan 1995).

On the other hand, experiential commensurability is about how congruent are the frames with the personal, everyday experiences of the public. For example, in China during the social uprising of 1989 led by the Chinese Democracy Movement, activists drew the attention of millions of citizens by aligning their tactics with ordinary people's observations and experiences (Zuo and Benford 1995). Economic reforms in China at that time had created an environment where official profiteering and corruption were common place among elites. At the same time, ordinary citizens were aware of such patronage and the potential for the corruption to spread. The perception that the official reformers had failed to address the essence of their problems and the hope that activists, who were mostly students, would be able to lead the forces of "real reform" were widely shared by Beijing residents. Although the uprising ended up with the massacre of several hundreds of demonstrators at the Tiananmen Square by the Chinese army, the crowd protests are considered "the first time in modern authoritarian China that a grassroots movement galvanized and activated a large proportion of the populace" (Zuo and Benford 1995, p. 149).

3.5 Sensegiving via Framing of the Guatemalan Social Tragedy²

In the aftermath of the social tragedy, frames helped "people understand complex issues" (Miranda et al. 2016, p. 307) by associating key aspects of the tragedy with the "existing schemata in a population's

² This section presents the theoretical framework of this thesis based on sensemaking and framing theories that emerged from the analysis of the Twitter communications in the aftermath of the tragedy. This theoretical framework also incorporates elements relevant to social media communications related to fake news and rumouring. In the interpretive research approach followed in this thesis (discussed later in chapter 4), this theoretical framework emerged from the data (instead of being derived from prior theory that drives data collection and analysis). Therefore, I present in this section the theoretical framework following the discussion on sensemaking and framing theories to foreshadow the major findings that emerged from the study of the Twitter data.

belief systems” (Entman 1993, p. 53). In this way, frames enable individuals to “locate, perceive, identify, and label occurrences within their life space and the world at large” (Goffman 1974, p. 21). In the aftermath of the social tragedy, diverse social actors relied on social media as a means of communication to create, share, and broadcast frames to a larger population. Through social media channels, content created by a single author can be seen by other users who can further spread the content onto their respective networks, amplifying the audience of the content to a potentially massive scale (Lerman and Ghosh 2010; Myers et al. 2014; Shi et al. 2013).

Drawing on literature on framing theory (Benford and Snow 2000) and sensemaking theory (Weick 1995), I refer to *informative frames* and *persuasive frames* as two main types of frames related to the sensegiving of the Guatemalan social tragedy. To investigate how diverse actors used social media for giving sense and framing the social tragedy, I first explain properties and functions of social media content carrying *informative frames* and *persuasive frames* of the tragedy.

3.5.1 Informative Frames

The social tragedy brought with it “discrepancies and irregularities in ongoing circumstances” (Weick et al. 2005, p. 411). I refer to this process as *informing*³, where people noticed that something unexpected has happened. People become highly suggestible to cues that allow them to construct an impartial understanding of the situation (Oh et al. 2015; Turner and Killian 1987). In this stage, media organizations are essential for reporting on the tragedy (Oh et al. 2013). In words of Weick et al. (2005, p. 411), *informative frames* “bring orderliness to the circumstances by constructing an initial interpretation of the situation.”

Fundamentally, *informative frames* result from communicational efforts aimed at reducing informational uncertainty (Oh et al. 2013; Oh et al. 2015) by reporting on the sequence of events that unfolded during the incident. Studies confirm that when the author’s goal is to inform, then the authored text is dominated by semantic relations (Sanders 1997; Sanders et al. 1992; Schellens and De Jong 2004). That is, if we decompose the content’s text into segments or sentences, the segments should relate to each other by the individual meaning of each segment (Sanders et al. 1992). For example, the text below comprises two sentences describing the history of the care home where the Guatemalan tragedy happened:

(1) “*The care home began operating in June 2010. An advocate of the children working at the Guatemalan Human Rights Office, assures us that with the change of government in 2012, the authorities reduced the attention to the care home.*”

In the text above, each sentence reveals an aspect of the care home’s history, and when combined, they inform the reader about the antecedents of the care home. Through semantic relations, a text or discourse attempts to maintain objectivity by reflecting a logical structure that is independent of the opinions or viewpoints of the author (Kamalski et al. 2008). Thus, semantic relations govern *informative*

³ Turner, R. H., & Killian, L. M. (1987). Turner, R. H., & Killian, L. M. (1987). *Collective Behaviour*. Englewood Cliffs, NJ: Prentice-Hall refer to this process as “milling.”

frames aimed at reducing informational uncertainty and allowing the reader to extract a factual account of the circumstances.

As well as reducing information uncertainty, *informative frames* prevented the propagation of rumors by eliminating information ambiguity (Oh et al. 2013). Shibutani (1966) defines rumoring as a collective effort through which people attempt to construct a meaningful interpretation of an ambiguous situation by pooling their intellectual resources. Rumors are a form of “improvised news” (Shibutani 1966, p. 17) that typify undefined or ambiguous situations, especially where official news was either partially or completely absent, or perceived as untrustworthy. Rumors are seen to negatively affect the community in which they circulate because they “lack factual basis and veracity” (Shibutani 1966, p. 163). In social media environments rumors are typically associated with the creation of “fabricated content, unverified events, lies, and misinterpretations” (Oh et al. 2013, p. 408). Thus, stories transmitted by *informative frames* must be reliable enough to avoid turning events into ambiguous situations that lead to rumor mills.

Previous studies have suggested that in online environments, information ambiguity has two dimensions: content ambiguity and source reliability (Oh et al. 2013; Schifferes et al. 2014). Content ambiguity attends to the interpretative clarity of meaning contained in the information. It relies on the notion that when information does not convey a clear meaning, people endeavor to remove ambiguity by elaborating their account of the circumstances (Knopf 1975; Rosnow and Fine 1976). For example, the text below comes from a tweet created in the aftermath of the Guatemalan tragedy:

(2) “22 young people died in the care home; after being abandoned, now their families show up, those that abused many of them. Compensation?”

The text above is ambiguous because rather than clarifying the situation, the message awakens suspicions about the motives of the victims' families. By contrast, content that is interpretatively unambiguous avoids expressions of distrust or confusion (Allport and Postman 1947) and excludes sarcastic remarks or persuasion attempts (Oh et al. 2013).

On the other hand, source reliability concerns the trustworthiness of the information source. According to Oh et al. (2013), several studies argue that, when information is void of trustworthy sources, “people tend to make predictions with their own subjective wishes or bounded knowledge to reduce ambiguity” (p. 410). Source reliability is attained when the content is authored or created by a reputable entity or influential expert (Schifferes et al. 2014). Thus, the higher the perceived status and reliability of the content articulators or the organization they represent, the more robust and valuable the content is for preventing the spread of rumors (Oh et al. 2013; Schifferes et al. 2014). Likewise, the presence of verifiable sources in the content is also crucial for increasing source reliability. Verifiable sources include external sources (e.g., links to news articles), visual assets (e.g., photographs and videos), and testimonies. Thus, when informative content is attached with verifiable sources, then it suppresses the incentive to devise rumors (Oh et al. 2013).

Several studies have found that the association of reliable and verifiable sources is crucial for distinguishing between true and fake reports in social media (Castillo et al. 2013; Lehmann et al. 2013; Schifferes et al. 2014). Reliable sources of information and the presence of verifiable sources in the content are essential not only for preventing rumoring (Oh et al. 2013), but also to avoid the spread of fake news (Schifferes et al. 2014; Tandoc Jr et al. 2018).

In conclusion, messages produced as *informative frames* aimed to reduce information uncertainty and prevent the propagation of rumors and fake news through the production of reliable and intelligible content.

3.5.2 Persuasive Frames

The next type of frames results from a process of *persuasion*⁴. The main function of *persuasive frames* is to contribute to the understanding of the tragedy as a problematic condition that needs to change. In the aftermath of tragic events, *persuasive frames* “promote a particular problem definition” (Entman 1993, p. 52). *Persuasive frames* identify and define problems by rendering some aspects of the tragedy as divergent from the expected view of the world. In doing so, *persuasive frames* draw on the framework of values and beliefs available in society to layout a normative basis on which human actions can be labelled as “right” or “wrong.”

Persuasive frames allow people to “make moral judgments by evaluating causal agents and their effects” (Entman 1993, p. 52). Researchers have also argued that when the goal of the author is to make an argument, text is dominated by pragmatic relations (Sanders 1997; Sanders et al. 1992; Schellens and De Jong 2004). This means that the segments or sentences comprising the content’s text are related to each other by the author’s intention of one or both sentences. For example, the text below comes from a tweet created in the aftermath of the Guatemalan tragedy:

(3) “*When 33 girls die in custody of public authorities, it is no longer an accident. It is a state crime.*”

In the text above, the state of affairs in the first sentence is not the cause of the state of affairs in the second sentence, but the justification for making that utterance. By combining both sentences, the author attempts to persuade the reader that the incident was not accidental, but the outcome of a crime perpetrated by the government. Through pragmatic relations, a text or discourse attains subjectivity by expressing feelings, attitudes, and opinions, or persuading the reader of something (Kamalski et al. 2008; Sanders 1997).

Unlike informative frames, *persuasive frames* are “driven by plausibility rather than accuracy” (Weick 1995, p. 55) through empirical credibility rather than by source reliability. Thus, persuasive framing is not about the truth and getting it right. Instead, it is about “continued redrafting of an emerging story so

⁴ Turner, R. H., & Killian, L. M. (1987). *Collective Behaviour*. Englewood Cliffs, NJ: Prentice-Hall refer to this process as “keynoting.”

that it becomes more comprehensive, incorporates more of the observed data, and is more resilient in the face of criticism” (Weick et al. 2005, p. 415).

The frame resonance properties of empirical credibility, centrality, and experiential commensurability are essential for *persuasive frames* to promote the definition of a problematic condition or situation that needs to change. The more frames to align with the beliefs, values, and experiences of the citizenry, the more likely they are to resonate with them. In this regard, the *persuasive framing* of the tragic event is essential for rendering events meaningful to a broader population and thereby functions to guide, inspire, and legitimate further action (Benford and Snow 2000; Goffman 1974).

Drawing on the descriptions of the informative and persuasive frames presented in this section, Table 3.1 below integrates the two types of frames with the properties of sensemaking discussed by Weick (1995). I believe that both informative and persuasive frames exhibit the properties of plausibility and identity discussed by Weick (1995), and these are the most important characteristics of stories that are retained as the outcome of sensemaking.

Table 3.1. Integration of informative and persuasive frames with properties of sensemaking

Frame Type	Frame Property	Sensemaking Property
Informative	Interpretive unambiguity	Plausibility
	Source reliability	Plausibility
Persuasive	Empirical credibility	Plausibility
	Centrality	Identity
	Experiential commensurability	Identity

In the table above, informative frames relate to the sensemaking property of plausibility by exhibiting interpretive unambiguity and source reliability. Frames carrying meanings that are easy to interpret, created by a reputable author, and containing verifiable sources, all contribute to the plausibility of the frame. On the other hand, persuasive frames relate to the sensemaking property of plausibility by carrying empirical referents. In persuasive framing, empirical referents serve as “evidence of the claim embedded in the framing” (Benford and Snow 2000, p. 620), so that they become “more comprehensive, incorporate more of the observed data, and are more resilient in the face of criticism” (Weick et al. 2005, p. 415). Persuasive frames also relate to the sensemaking property of identity by reflecting beliefs and values of the public and connecting to experience.

Table 3.2 below proposes a theoretical framework for investigating the sensegiving via framing by diverse actors of the Guatemalan social tragedy. The table summarizes two frames for describing the sensegiving of the Guatemalan social tragedy through social media—these are informative and persuasive frames. I argue that these two types of frames enable us to understand how can the

sensegiving of a social tragedy through social media challenge the trust in public authorities, which is the central question in this thesis.

Table 3.2. A framework for studying the sensegiving via framing of the social tragedy in social media

Frame Type	Communicative Goal	Properties		Function	
				Increases	Reduces
Informative	Construct an impartial understanding of the tragedy	Interpretive unambiguity		-	Rumoring
		Source reliability	Author's reputability or expertise	-	Rumoring, fake news
			Presence of verifiable sources	-	Rumoring, fake news
Persuasive	Contribute to the understanding of the tragedy as a problematic condition that needs to change.	Empirical credibility		Resonance	-
		Centrality regarding beliefs, and values of the public		Resonance	-
		Experiential commensurability		Resonance	-

3.6 Legitimation Crisis and ICT

In the aftermath of a tragedy, *informative* and *persuasive* frames contributed to creating shared awareness and motivating a course of action or response to the situation. When a tragic incident involves a public institution, framing public authorities as culpable agents leads to a decline of trust in public institutions. The blaming of public authorities for a tragedy can lead to what Habermas (1975) calls a "legitimation crisis." A legitimation crisis happens when the citizens withdraw their support to public authorities and replace it with questioning of the current institutions (Pearson and Clair 1998).

During a legitimation crisis "the masses become ungovernable, and control and avoidance of social conflict are difficult" (Pearson and Clair 1998, p. 7). It is common for the civil society to engage in acts of rebellion or uprisings against the established rule (Kendall 2012). Without the conventional capabilities necessary to gain access to the political system and affect change there, "the powerless rely on unorthodox measures to create disorder and thereby apply pressure" on public authorities (Terchek 1974, p. 133). Under these circumstances, crowd protests and mass mobilizations become the primary mode for the public to drive political change (Terchek 1974) or improve some aspect of the status quo (Kendall 2012). People act collectively rather than singly because "they believe that there is strength in numbers" (Kendall 2012, p. 601).

An increasing number of studies have documented the role of ICT in organizing crowd protests. Although crowd protests have existed before the invention of social media technologies, the use of social media to organize crowd protests is relatively new. The speed within which crowd protests emerge is also unprecedented. Existing literature on social media has shown the efficiency and pitfalls of social media for mediating collective communication during political upheavals in Iran (Burns and Eltham 2009) and Moldova (Mungiu-Pippidi and Munteanu 2009). On January 2001, a massive crowd protest arranged mainly by text messages created the conditions for Philippine President Joseph Estrada to be impeached (Tilly 2004), marking the first time that social media had helped force out a national leader (Shirky 2011). The role of social media in the mass mobilizations during the Egypt Revolution in 2011 is also well documented (Howard et al. 2011; Lotan et al. 2011; Oh et al. 2015).

The coverage of tragic events in social media has been increasingly linked to recent political upheavals and crowd protests demanding political reforms in different countries. During the Egypt Revolution in 2011, expressions of dissent against the Egyptian government began with a Facebook page condemning the decease of a young man that was beaten to death by the Egyptian police (Howard et al. 2011). Oh et al. (2015) argue that social media become a platform for funneling the anger, frustration, and desire for freedom, leading to the resignation of the Egyptian president. In the words of Oh et al. (2015), "if there were no social network, the 2011 Egypt Revolution would have never sparked." In 2013, the Black Lives Matter movement in the US was born as a Twitter hashtag following the acquittal of a police officer responsible for the death of an African-American teenager (Rickford 2016). More recently, in the aftermath of a shooting in a US school in 2018, initial reports describing the emergence of the Never Again movement highlight the role of social media on enabling a shared understanding of the tragedy and incentivizing calls for gun law reforms in the US (CNBC 2018; The New Yorker 2018).

3.7 Alternative Media

An important component of the use of ICT by diverse actors in society for framing a social tragedy is the understanding of how those actors adapt technology to fulfil their purposes. In this thesis, I am particularly interested in the use of ICT by media organizations. The term media organization refers to an entity engaged in disseminating information to the general public through different communication channels. In this thesis, I focus on two types of media organizations: traditional media and alternative media based on Lievrouw (2011)'s classification scheme of the media. Traditional media are distinguished from alternative media by their content and point of view.

Traditional media refer to media organizations that reflect and shape prevailing currents of thought in society (Lievrouw 2011). Traditional media include conventional news sources that most people know about and regard as reliable. Traditional media use a diverse array of communication channels to reach a large audience, such as newspapers, TV channels, radio stations, and the Internet Lievrouw (2011). Traditional media is also commonly referred as mainstream media. On the other hand, alternative media organizations often engage in the expression of a more diverse or alternative viewpoint which may contrast traditional media (Lievrouw 2011).

In this thesis, I draw on the notion of alternative media proposed by Lievrouw (2011) to describe the appropriation of technology by social actors to frame social tragedies in ways that emphasize the need for social change, i.e., *persuasive framing*. Lievrouw (2011)'s perspective of mediation provides the analytical lens for studying the "current rise and diversity of activist media projects in the information age" (Wolfson 2012). In this section, I further expand the concept of alternative media.

According to Lievrouw (2011, p. 19), ICT enables the emergence of alternative media projects or organizations to "challenge or alter dominant, expected, or accepted ways of doing society, culture, and politics." The creators of alternative media take advantage of the networked nature of the Internet and the ubiquity and interactivity of ICT to critique and intervene in prevailing social, cultural, and political conditions. Alternative media projects seek to be faithful to a community's values and experiences and independent of the interests of political and business elites in a way that departs from most media corporations and monopolies (Atton 2004). An important aspect of alternative media projects is that they "do not only reflect or critique mainstream media and culture, they also constitute and intervene in them" Lievrouw (2011, p. 19).

Lievrouw (2011) develops a five-part typology for differentiating five genres of alternative media—culture jamming, alternative computing (hacktivism), critical journalism (which Lievrouw (2011) calls participatory journalism), mediated mobilization, and commons knowledge. Lievrouw (2011) outlines a framework based on common themes in social movements to explain features across the five genres of alternative media. At the most general level, three major themes link social movements and alternative media: the *scope* of alternative media projects; the *stance* of movements and projects relative to dominant society and culture; and the nature of projects as *action* and activists as *agents* of change. In this thesis, I focus on the critical journalism and mediated mobilization genres.

According to Lievrouw (2011), the five genres of alternative media are the product of an ongoing relationship between the reconfiguration of communication technologies and the remediation of communicative action. Communicative action is action undertaken by individuals based upon mutual deliberation and argumentation. Communicative action relates to the notion of persuasive framing as both terms promote the approach of perspectives that encourage others to engage in actions that seek to remedy a conflictive situation. Reconfiguration is the process by which people adapt ICT as needed to suit their various purposes or interests. Remediation is the process by which people construct new meanings and expressions out of existing and novel forms of interaction and social relationships. Reconfiguration and remediation relate to technology and action, respectively. However, they do not exist independently, but mutually implicate and reconstitute each other in a larger, dialectical process which Lievrouw (2011) class mediation.

In this section, I summarize the genres of critical journalism and mediated mobilization since those two genres are the most relevant for understanding how diverse social actors use social media for the persuasive framing of a social tragedy. Among all genres listed by Lievrouw (2011), only those two represent media relatable to the media groups existent in Guatemala and that engaged in the use of Twitter for sharing information about the tragedy.

3.7.1 Critical Journalism

Critical journalism consists of media groups with perspectives that are often critical of the status quo in society, culture, and politics (Atton 2004; Fuchs 2010; Lievrouw 2011). The rise of critical journalism stems from the failure of media corporations to act in service of society as a result for their “relentless, ever-expanding demands for profit and shifts away from straight news and critical analysis to entertainment and lifestyle coverage in attempts to woo younger audiences” (Lievrouw 2011, p. 122). For example, according to articles discussed in the research context section (e.g., LeBrón (2009)), activist groups in Guatemala have emerged as watchdog organizations that scrutinize government institutions, counter-attacking the censorship promoted by pro-government media monopolies.

In contrast to traditional journalism, most critical journalism projects do not adhere to a centrally approved political line (Downing 2001). The goal of critical journalism is to overcome the barriers of editorial gatekeeping by reflecting a commitment to freedom of speech in which any voice can be heard and where anyone can express their opinions (Pickard 2008). Instead of the traditional advertising-based business model, critical journalism projects tend to adopt alternative support models, including not-for-profit foundations and crowdfunding, to support their activities (Kershaw 2008).

Linking to Lievrouw (2011)’s genre framework, critical journalism with respect to *scope* tends to be produced and hosted by small teams. This feature is attributable to the fact that few activists have access to large, reliable sources of funding and staff. Regarding *stance*, critical journalism act as “other spaces” or “counter sites” for expression. Critical journalists seek to demonstrate and exemplify new, alternative values and practices for the rest of society, out of a will to create renewed communities within an increasingly thicker social network. In terms of *action and agency*, critical journalists seek to interrupt or alter existing conditions, to subvert common-sense or taken-for-granted meanings and situations in society.

To sum up, critical journalism critiques and opposes the market-driven cynicism and detachment of mainstream press, adopting practices and values of professional journalism online as a method of transforming the content and production of the news, and to renew its role as a brake on the government and corporate power (Lievrouw 2011).

3.7.2 Mediated Mobilization

Whereas critical journalism aims to change public discourse and perceptions by creating the cultural and material conditions for what activists believe will be a better society, mediated mobilization “goes a step further by using ICT as the means to mobilize social movements in which people organize and work together as active participants in social change” (Lievrouw 2011, p. 150). In the context of developing countries in Latin America, the mediated mobilization genre encompasses a growing number of social movement organizations (SMOs) with political agendas. These groups, concerned with fighting government corruption, impunity, social injustice, and violations to human rights, rely extensively on ICT, particularly social media, for advocating their causes.

Following Lievrouw (2011)'s genre framework, mediated mobilization with respect to *scope* is largely collaborative because it promotes collaboration among like-minded people. Collaboration takes a variety of forms, from interpersonal relationships and interaction to the creation and sharing of ideas, opinions, and information to participation in large-scale crowd protests. Regarding *stance*, mediated mobilization projects act as insurgent forces existing "outside" the conventional institutions and practices of power that attempt to legitimate corrective actions to those institutions and practices. In terms of *action and agency*, mediated mobilization is fundamentally interventionist in purpose. At a society-wide level, mediated mobilization helps SMOs intervene in the workings of social and political institutions, endeavoring to change norms and values and reconfiguring the distribution of power and resources.

Mediated mobilization aligns with studies on the use of ICT by SMOs for promoting causes of social and political change (Selander and Jarvenpaa 2016; Shirky 2011). Mediated mobilization speaks to the organizing of crowd protests as a mechanism for demanding political change. The table below summarizes the genres of critical journalism and mediated mobilization as described by Lievrouw (2011).

Table 3.3. Summary of critical journalism and mediated mobilization adapted from Lievrouw (2011)

	Critical Journalism	Mediated Mobilization
Scope	Small-scale	Shared effort
Stance	Counter-site for expression	Outside dominant power structures
Action & Agency	Alter existing perceptions	Exercise direct action

Table 3.4 below presents an integration of the frame types summarized in Table 3.2 with the types of media proposed by Lievrouw (2011) relevant to this thesis. Traditional media are likely to adhere to traditional journalism practices of adopting a neutral stance in their reporting. Thus, traditional media are more likely to appropriate social media for authoring informative frames. On the other hand, alternative media organizations are media projects that aim to challenge the status quo in society and politics by providing alternative perspectives to reality. For this reason, alternative media are more likely to engage in the presentation of arguments intended to persuade their audiences of the existence of problematic conditions that need to change. Thus, alternative media are more likely to appropriate social media for authoring persuasive frames.

The reader should take this distinction as a generalization of the frames expected to be created by different genres of media. The table above does not state that traditional media should not engage in the authoring of persuasive frames or alternative media should not engage in the authoring of informative frames. Instead, Table 3.4 describes the scenario where traditional media are more likely to take a more neutral stance in their reporting in comparison to alternative media and that alternative media are more likely to engage in a more persuasive rhetoric than traditional media. Hence, Table 3.4

provides the basis for integrating the media genres summarized in Table 3.3 and the frame types summarized in Table 3.2. This integration lays down a starting point for the analysis of the data in the findings and analyses chapter.

Table 3.4. Integration of Table 3.2 with the genres of media proposed by Lievrouw (2011)

Frame Type	Expected Mediator
Informative	Traditional media
Persuasive	Alternative media

Chapter 4. Research Methodology

Researchers in IS have increasingly relied upon social media as sources of digital trace data for their investigations (Agarwal and Dhar 2014; Berente et al. 2018; Sarker et al. 2018). Digital trace data include profiles, interactions, and relationships among people in online environments (Miranda 2018). Social media are primary sources of digital trace data as well as news media coverage and conventional websites (Miranda 2018). Digital trace can represent marks or indications of human action (Lindberg 2019), such as posting, liking, or sharing a message online. Digital trace data typically involve visualization and pattern identification, “which provides ample fodder for predictive modelling” (Berente et al. 2018, p. 1). However, such models, visualizations, and patterns are not theory (Berente et al. 2018), and often fail to convey an understanding of the causal processes that yield the observed outcomes (Agarwal and Dhar 2014). To unleash the potential of digital trace data in IS research, researchers have increasingly adopted a “pragmatic approach to methodology by mixing and matching quantitative and qualitative approaches” (Sarker et al. 2018, p. 755).

This thesis, likewise, adopted a pragmatic approach to research methodology. I used a mixed-methods approach to overcome the challenges involved in the use of digital trace data for conducting research in IS. I used both qualitative and quantitative research methods in this thesis, combining interpretive case study research with social analytics. Social analytics is a subfield of data analytics that deals with the collection, management, and analysis of digital trace data (Miranda 2018). I will now describe the field site, the research context and the research methods used.

4.1 Field Site

In this thesis, the author chose Twitter as the field site to conduct the research. The author took the role of an outside observer (McKenna et al. 2017) that involved the use of web-crawling software to extract digital trace data from the Twitter platform.

Twitter is a social media application that allows “sending out short, text-based messages of 140 characters or less” (Kaplan and Haenlein 2010, p. 67) known as *tweets*. Two basic technological features characterize Twitter: (1) posting: the ability to create content, i.e., *tweeting* and (2) sharing: the capacity to broadcast other users’ messages, i.e., *retweeting*. Twitter also features a non-reciprocal mechanism for creating relationships in which the connections between users do not need to be reciprocal (Kwak et al. 2010). In other words, a user can *follow* the messages of another user, without the approval of the user being followed. Twitter’s features of content-sharing and non-reciprocal relationships formation have significantly powered the decentralized production and consumption of information (Shi et al. 2013).

4.2 Qualitative Research and Context

Qualitative methods in IS research are useful for studying social issues associated with innovations in ICT (Myers 2019). According to Myers (2019), qualitative research aims to preserve the social context that is largely lost when researchers quantify data. In contrast to quantitative methods that concern the discovery of general laws, qualitative methods are more concerned with the uniqueness of each situation. Qualitative research methods aim at explaining and understanding rather than predicting and controlling.

This thesis assumes that interpretations or sense of the tragedy given by several actors exposed underlying strains in the Guatemalan society that exacerbated sentiments of dissent and rebellion against public authorities. The central question in this thesis is how can the sensegiving of a social tragedy through social media challenge the trust in public authorities. To answer the research question, I conducted a case study of the Guatemalan social tragedy.

Different historical and cultural aspects influence that each society in the world is unique and different from the others. Periods of armed conflict in many emerging democracies in Latin American have contributed to the incrustation of a culture of silence in the media towards critical voices against the government. Such a culture of censorship and submission highlights a distinctive context where innovations in ICT enable the use of social media technologies for speaking up against wrongdoings committed by those responsible for governing the country. The author engaged in a qualitative approach to explaining how social actors used Twitter to influence the interpretation of the social tragedy in the context of historical media censorship that characterizes emerging democracies like Guatemala. This context is essential for elaborating on the contribution and interestingness of this thesis.

4.3 Overview of Interpretivism and Pragmatism

Interpretivism

Myers (2009) argues that qualitative research can follow different philosophies such as positivism, interpretivism, pragmatism, or critical realism, depending upon the underlying philosophical assumptions. This thesis follows an interpretive-pragmatic philosophical perspective. Qualitative researches draw on interpretivism to develop theories that are sensitive to both context and the meanings that individuals develop to constitute their social worlds (Charmaz 2006). According to Myers (2019), interpretive research attempts to understand phenomena through the meanings that people assign to the situation at hand. The philosophical base of interpretivism is hermeneutics, i.e., interpretation of texts, and asserts that access to reality is only through social constructions such as language, consciousness, and shared meanings. Interpretive research does not predefine dependent and independent variables but focuses on the complexity of human sensemaking as the situation emerges (Myers 2019).

This thesis follows an interpretive perspective because the author is interested in studying the meanings that diverse actors in society gave to the social tragedy using Twitter as a communication platform.

Interpretive studies generally attempt to understand phenomena through the meanings that people assign to them. Furthermore, interpretive methods of research in IS aim to produce an understanding of the context of the information system, in this case Twitter, and how the information system influences and is influenced by the context (Myers 2009). To understand how the use of Twitter enabled the framing of the tragedy, the author engaged in the analysis of communications driven by diverse Twitter users through different technological features of Twitter. Drawing on the interpretive philosophical perspective, this thesis aims to understand the meanings in the messages disseminated through Twitter by diverse actors in society with the intent to influence the public's interpretation of the tragedy.

Pragmatism

Additional technological features available in Twitter enable users not only to create but also to interact with content created by other users in the platform. The retweet feature described earlier allows Twitter users to broadcast content from other users. When a user clicks the retweet button to share a message, the message appears in the user followers' timeline—an instant stream of messages from a user's following list. There are different reasons why a user may retweet a message created by someone else. The user may like the message because it is humorous, the user agrees with what the content says, or the user wishes to support what the content represents. The action of retweeting a message also feeds an indicator in the message (also visible to other users) showing how many times the message has been retweeted. Hence, the act of retweeting a message leaves behind a form of digital trace data. While the user may retweet things for different reasons, each time a retweet happens, the user completes an intentional action—clicking the mouse or tapping the screen—to communicate with another person. In general, actions such as sharing and expressing approval or disapproval of other users' content through technological features such as retweet or “like”, are *technology-enabled communicative actions* that do not involve written or verbal language.

To address new forms of communication enabled by social media technologies, this thesis incorporates the philosophical view of pragmatism. According to Lindberg (2019), under pragmatism, human beings interface with the world, not through disembodied cognition, but contextually embedded performance of actions. For pragmatists, knowledge is important to the degree to which it contributes to explaining how actors act in the world to achieve specific goals. The section below discusses more details about how pragmatism provides the philosophical foundation for deriving principles that facilitate the interpretation of technology-enabled communicative actions.

In summary, the purpose of engaging in these philosophies is to draw on interpretivism to gain knowledge based on “what people said” and pragmatism to gain knowledge based on “what people did.” In a nutshell, the author argues that a dual focus on language and action provides the philosophical basis for studying diverse forms of Twitter-mediated communications in the aftermath of the social Guatemalan tragedy.

4.4 Mixed-Methods Case Study

Following an interpretive-pragmatic epistemology, the methodology in this thesis builds on established literature on interpretive case studies to explain how diverse actors in Guatemalan society used Twitter for framing the social tragedy. An interpretive case study is an empirical inquiry designed to investigate a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Myers 2009). According to Myers (2009), interpretive case study as a research methodology is the most common qualitative method used in information systems.

In this thesis, the author followed the interpretive case study methodology as outlined by Klein and Myers (1999). The author analyzed Twitter data communications by following several key principles of interpretive case studies (Klein and Myers 1999). Klein and Myers (1999, p. 71) emphasize “that the general principles of the interpretive case study method are not like bureaucratic rules of conduct, given that the application of one or more of them requires considerable creative thought.” Their use of the word “principles” guards against the idea that their use is mandatory; rather, it is “incumbent upon authors to exercise their judgement and discretion in deciding whether, how, and which of the principles should be applied and appropriated in any given research project” (Klein and Myers 1999, p. 71). This thesis focuses two key principles of the interpretive case study method described in Klein and Myers (1999): the principles of contextualization and abstraction and generalization.

4.4.1 Principle of Contextualization (Klein and Myers 1999)

The principle of contextualization requires critical reflection of the social and historical background of the research setting so that the intended audience can see how the current situation under investigation emerged. Under this principle, one of the key tasks becomes one of seeking meaning in context. Various contexts can be explored, the choice largely depending upon the story the author wants to tell. The contextualization principle requires that the subject matter be set in its social and historical context, so that the intended audience can see how the current situation under investigation emerged.

In this thesis, the goal of applying this principle is to contextualize Twitter communications in the aftermath of the Guatemalan tragedy by situating them within a process of media emancipation in Guatemala. The capacity of diverse actors in Guatemalan society to use social media for expressing their views and reaching an audience takes a special meaning in the context of a nation where traditional media fail to fulfil their role of scrutinizing the actions of those in power.

4.4.2 Principle of Abstraction and Generalization (Klein and Myers 1999)

The principle of abstraction and generalization requires relating the ideographic details revealed by the data interpretation to theoretical, general concepts that describe the nature of human understanding and social action. When applying this principle to the interpretation of Twitter communications in the aftermath of the social tragedy, the goal is to triangulate observations with the theoretical foundations described in the literature review section.

A fundamental aspect of the abstraction and generalization principle is how the researcher draws on extant theory related to the phenomenon to claim a theoretical contribution. The literature review chapter introduces sensemaking, sensegiving and framing theories. The author draws on these theories as “an up-front guide to inform the research project” (Sarker et al. 2018, p. 761). This thesis intends to contribute to the IS literature by explaining the content created through Twitter by different types of media organizations that attempted to influence the public in their sense or interpretation of the Guatemalan social tragedy.

4.4.3 Limitations of the Interpretive Case Study Method

The principles discussed by Klein and Myers (1999) are fundamental ideas derived from classical views of interpretivism. These principles were designed to conduct “interpretive research of a hermeneutic nature”, i.e., of being interpretable text. The hermeneutic philosophy that underlies the interpretive case study method assumes that the phenomena can be described using textual data or a “text-analogues.” A text-analogue is anything that the researcher comes to understand through oral or written text (Myers 2009). The particular set of principles suggested by Klein and Myers (1999) is designed to conduct interpretive research of a hermeneutic nature. Building on hermeneutics, the interpretive case study methodology aims to understand phenomena “by iterating between considering the independent meaning of parts [in a text] and the whole that they form” (Klein and Myers 1999, p. 72). Accordingly, the interpretive case study method has traditionally relied on the interpretation of text collected using various techniques such as interviews and documentary materials (Myers 2009).

Interaction between the Researcher and the Subjects

Qualitative approaches that use the interpretive case study method may also involve the collection of data obtained via observational techniques like participant observation (Myers 2009). In these cases, the data are generated in close contact with the research participants to attain a comprehensive and in-depth understanding of the phenomenon under study. The incidence of phenomena related to contemporary online communications presents a context different from the face-to-face environment in which researchers have traditionally conducted interpretive case studies using observational techniques. Some researchers have endeavored to modernize traditional interpretive research practices by proposing what Kozinets (2010) calls “netnography”. Netnography focuses on constructs of online communities and online culture or the “cyberculture”. In netnography, empirical data manifests through the digital traces of occurring public conversations recorded by communication technologies. Netnography follows an interpretive perspective and tries to adapt the traditional, in-person participant observation techniques of anthropology to study interactions and experiences manifesting through online communications.

A fundamental difference between data obtained either through direct interaction with the participants (e.g., interviews) or observational techniques (e.g., participant observation or netnography) and a dataset scraped from social media sites using web crawler software, is the proximity (either physical or virtual) between the researcher and the research participants. Although netnography aims to deal with

the challenges involved in the interpretation of digital trace data, it assumes an intimate connection between the researcher and the research participants. In this scenario, the researcher “immerses himself or herself in the life of the social group under study” (Klein and Myers 1999, p. 69) and seek to place the phenomena studied in their social and cultural context (Myers 2009). The interpretive case study method embodies a form of interpretivism whereby interpretation is done through an immersion in the phenomenon under study. In the interpretive case study method, “the data are not just sitting there waiting to be gathered, like rocks on the seashore” (Klein and Myers 1999, p. 74). Under this view, the practice of finding meaning in context is “part and parcel of the social interaction of the researchers with the participants” (Klein and Myers 1999, p. 74). A close connection (either face-to-face or online) between the researcher and the research participants is likely to expose several aspects of the phenomenon that facilitate the conceptualization of human actions, such as retweeting or liking content, in tune with the social and cultural context of the phenomenon.

However, when using automated means for collecting data from online environments, the development of a close connection with or “immersion in the lives” of the research participants is not always possible. Indeed, such level of intimacy, regardless of its potential for revealing interesting and underlying truths, poses limitations to what researchers can learn from digital trace data. Indeed, ubiquitous information systems like social media sites provide an increasing availability of granular digital traces of human activities and new phenomena that are fertile ground for interpretive case studies. However, without the opportunity for consulting the user about the reasons for his or her actions, the researcher faces the challenge of how to understand phenomena “through the meanings that people assign to them” (Klein and Myers 1999, p. 69). The challenge becomes even more difficult when the phenomena involves technology-enabled communicative actions such as liking or retweeting that do not involve verbal or written text.

Complementing the Principles of the Interpretive Case Study Method

Social media sites enable alternative ways of communication that derive from the execution of actions through technological features that can have different interpretations. In contrast to data generated through instruments like interviews or observational techniques, digital trace data constitute empirical materials that researchers cannot directly define as the operationalization of a concept. Digital trace data are highly heterogeneous and unstructured so that researchers can manipulate, transform, and interpret them in ways not contemplated by traditional qualitative approaches (Shmueli and Koppius 2011).

The author argues that when the researcher is not able to socially interact or make acquaintance with the research participants, the current principles of the interpretive case study method are not sufficient for guiding the interpretation of actions embedded in digital trace data. As suggested by Klein and Myers (1999, p. 68), “other authors may suggest additional sets of principles.” The author of this thesis suggests adding two principles of pragmatism outlined by Lindberg (2019): constitution and consequences. The goal is to complement the interpretive case-study method and facilitate the

interpretation of digital trace data when an interaction between the researcher and the subjects is not possible.

4.4.4 Principle of Constitution (Lindberg 2019)

The constitution principle refers to the view of action becoming habitual. Human beings develop propensities to act in specific ways, thus laying the groundwork for routines and capabilities to emerge. This principle acknowledges the agency and creativity of individual actors confronting a specific situation embedded in a particular context. However, as individuals develop habits that result from the frequent repetition of their actions, the constitution principle states that digital trace data allows the crafting of accounts that show, empirically, how patterns emerge from the idiosyncrasies of agentic action.

The pragmatist view of action is different from the dominant strains of practice theory drawing upon Giddens (1979)'s structuration theory, which mostly powered various qualitative studies in IS (e.g., Orlikowski and Scott (2008) and DeSanctis and Poole (1994)) that focused on identifying generative mechanisms which produce structural patterns in organizations. Views of IS based on structuration theory have a tendency towards isomorphism between the agentic and structural levels, whereas the pragmatist outlook "strongly emphasizes the agency of individual actors confronting a specific situation embedded in a particular context" (Lindberg 2019, p. 4). The aim of a pragmatic view of digital actions is to "avoid excessively abstract, structural and over-socialized accounts of human practices, devoid of individual agency" (Lindberg 2019, p. 4). Under the pragmatic view, Twitter-enabled communications contain traces of human actions, such as the posting and sharing of content, that produce large-scale patterns emerging from idiosyncratic and habitual actions embedded in a particular context.

4.4.5 Principle of Consequences (Lindberg 2019)

The pragmatic principle of consequences states that when we try to understand how actors think about and interpret their worlds, we must also look at their actions, and see what consequences those actions have. This principle posits that understanding causality is central to understanding meaning since the meaning of human action largely resides in its consequences. Put it simple, the consequences principle speaks to the consequences of an action.

Lindberg (2019) draws special attention to context in agreement with the interpretive principle of contextualization introduced by Klein and Myers (1999). Action can only be understood in terms of its context and the associated meanings attached to various actions. This is an important insight, because "as much as pragmatism puts emphasis on causation, the concern is less with establishing general laws or patterns, and more about illustrating contextually efficacious practices" (Lindberg 2019, p. 5). The principle of consequences aligns with the philosophical basis of the interpretive case study method by considering context as central for an idiographic strategy of inquiry. The principle of consequences complements the interpretive case study method by acknowledging the practical consequences of human action as embedded socially and culturally in a particular context.

In social media-enabled communications, the interpretation communicative actions following the consequences principle involve the recognition of idiosyncratic action as consequential, since “the meaning of an action largely resides in its consequences” (Lindberg 2019, p. 5). In the Twitter communications unfolded in the aftermath of the tragedy, perceptions about government performance is a consequence that results from the creation and dissemination of content aiming to inform the public about the actions and accountability of those in power.

4.4.6 Summary

Pragmatism introduces principles to study human action and its consequences within a context. The combination of principles derived from interpretive case study and pragmatism allows us to examine context, language, and actions, to understand phenomena as they emerge from the micro- to the macro-level. Accordingly, the author proposes the term “mixed-methods case study” in this thesis to refer to Klein and Myers (1999)’s interpretive case study as a research methodology that includes principles of Lindberg (2019)’s view of pragmatism. Table 4.1 below summarizes the principles guiding the mixed-methods case study methodology applied to conduct this thesis.

The interpretive-pragmatic case study approach proposed in this thesis aims to eliminate the social interaction of the researcher with the participants as a required condition for finding meaning in context. The focus moves from understanding the meaning that individuals give to their actions and those of other people to the meaning of patterns that emerge from idiosyncrasies of agentic action. While it is hard to interpret internal emotional or cognitive states, we can clearly observe concurrent actions emerging as trends when people engage in a particular or characteristic type of behavior. It follows from this that the researcher takes on the task of interpreting patterns of action in terms of their context and the associated meaning attached to those patterns.

Table 4.1. Summary of Principles for the Mixed-Methods Case Study

Principle	Epistemology	Reference	Application in this Thesis
Constitution	Pragmatism	Lindberg (2019)	The posting and dissemination of content through social media represent idiosyncratic agentic actions that produce large-scale patterns.
Consequences	Pragmatism	Lindberg (2019)	Communicative actions mediated by social media are important to the extent in which we can understand their consequences.
Contextualization	Interpretivism and Pragmatism	Klein and Myers (1999)	The historical and social background of the social tragedy is essential for understanding the content disseminated via Twitter in the aftermath of the tragedy.

Abstraction and generalization	Interpretivism	Klein and Myers (1999)	Sensemaking theory and framing theory serve as sensitizing elements to guide the analysis and interpretation of the empirical data.
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4.5 Inductive and Abductive Analysis

Following the mixed-methods case study methodology, the analysis in this thesis follows several techniques from social analytics to analyze the Twitter communications that unfolded in the aftermath of the Guatemalan tragedy. Miranda (2018) classifies social analytics techniques into two major classes: (1) social network analysis (SNA) which is the study of who interacts with whom; and (2) text analysis which is the study of the contents of conversations and discussions, typically in textual formats. While SNA deals with the structural aspects of interactions over a network of communications, text analysis studies the content of those communications. Social analytics typically deals with: (1) data about who connects with whom and (2) data about the content of a conversation, typically textual information. The author applied social analytics for analyzing data about connections between Twitter users created using the retweet feature and textual information using the tweet feature.

4.5.1 Social Network Analysis

Social network analysis (SNA) is the process of investigating structures using social networks. The basic building blocks of a social network are nodes and ties (Miranda 2018). A node usually represents a discrete actor. A tie is a link between nodes. Usually a tie represents an actual interaction between two actors. There are two major types of networks: directed and undirected. In this thesis, the author uses a directed network to represent interactions between Twitter users via the retweet feature in the Twitter communications that unfolded in the aftermath of the Guatemalan tragedy. A directed network is one in which a tie need not be reciprocated. Interactions between users through the retweet feature instantiates a directed network of standing interactions, where user “A” retweeting the message of user “B” results in a non-reciprocal communication between “A” to all “A”’s followers. It is non-reciprocal because user “B” does not need to engage in any communication with user “A.”

4.5.2 Text Analysis

One problem with using traditional manual techniques to analyze digital trace data is that the researcher can become overwhelmed by the sheer size of the datasets (Berente et al. 2018; Lindberg 2019). Digital traces can easily comprise thousands if not millions of data points, making it quite difficult for qualitative researchers to approach it using manual coding techniques (Lindberg 2019). In this thesis, the total number of tweets collected represents an enormous volume of data, meaning that complicates the analysis in a qualitative study. Thus, quantitative approaches can be useful to filter or reduce the vast amount of content (McKenna et al. 2017).

Qualitative researchers have increasingly relied on computational tools for automating inductive analysis using quantitative approaches (Berente et al. 2018; Lindberg 2019; Vaast et al. 2017). The combination of digital traces and computational tools allows us to use unobtrusive data to discover large-scale patterns that can replace manual coding techniques (Lindberg 2019). The computational tools allow us to discover patterns across large datasets, a task which often is difficult to perform manually (Berente et al. 2018). Such tools are not necessarily associated with traditional, positivist, hypothesis-testing approaches to research, but are inductive in their approach to data (Lindberg 2019).

This thesis applies Latent Dirichlet Allocation (LDA) topic modelling technique (Blei et al. 2003) for conducting an inductive analysis of the Twitter communications that unfolded in the aftermath of the Guatemalan tragedy. Topic modelling is a computational text analysis technique designed to uncover the distribution of “topics” (or themes) in text corpus (Rai 2016). The purpose of topic modelling is to “facilitate finding needles in a haystack by shrinking the haystack” (Miranda 2018, p. 182). In contrast to other topic modelling implementations, the LDA approach “was originally developed with the purpose of validating and uncovering topic models in unstructured texts” (Miranda 2018, p. 188). Thus, “many consider LDA the preeminent technique for topic modelling” (Miranda 2018, p. 188). Studies in the IS literature have used this technique to discover topics underlying customer service e-mails (Müller et al. 2016b) and video game reviews (Müller et al. 2016a).

According to Müller et al. (2016a, p. 293), computational text analysis techniques like topic modelling LDA “permit researchers to work with much larger samples, enable the discovery of subtle patterns in texts, and allow mixed method studies.” The goal of applying topic modelling in this thesis was to explore underlying topics in the tweets related to the Guatemalan tragedy and automatically classify the tweets into those topics. The author later uses the resulting scheme of classification and the corresponding themes as the basis for engaging in a deeper understanding of the meanings governing the purpose of each tweet.

Several computational packages include SNA and topic modelling implementations useful for describing and visualizing patterns in the retweet network derived from the Twitter communications in the aftermath of the tragedy. The challenge is interpreting those patterns to convey an understanding of the processes driving the observed outcomes. To understand patterns obtained from the SNA and topic modelling, the author engaged in an abductive mode of analysis that facilitated the integration of the principles of the mixed-approach case study method. Table 4.2 below presents a summary of the computational analysis techniques used in this thesis.

Table 4.2. Summary of computational analysis techniques

Technique	Application in this Thesis
Social Network Analysis	Visualize the prominence of social actors in the Twitter communications.
Text Analysis: Topic modelling	Uncover underlying topics in the Twitter communications and classify the data according to those topics.

4.5.3 Abductive Inquiry as Discovery and Justification

Abduction consists of an “iterative alternation between discovery and justification” (Lindberg 2019, p. 7). Furthermore, abduction is about generating hypothesis, that if true, makes sense of the data at hand. The purpose of abduction as a mode of analysis is to transform an indeterminate situation into one that is determinant. According to (Lindberg 2019), abduction is a process that involves two phases: discovery and justification. Abduction starts with the discovery of patterns rather than the a priori formulation of working hypotheses. These working hypothesis are “reasonable inferences tempered by theoretical experience and intimacy with the data under scrutiny” (Lindberg 2019, p. 6). For example, the goal is to use SNA to discover large-scale patterns and structures in the retweet network. The goal of topic modelling is to discover underlying topics in vast number of tweets covering the social tragedy.

Such patterns then can lead to the formulation of working hypothesis that would justify those patterns. Such reasonable inferences are drawn from analysis of data but are not seen to be inductively or deductively true. Rather, they should be assessed based on whether a conclusion drawn from evidence is reasonable, meaning that it probably follows from the data analysis. As the researcher identifies reasonable working hypotheses, it follows the task to justify them against other forms of data through “human pattern recognition”, i.e., using the human mind to discern patterns in data. This amounts to a process of constant comparison between different forms of data and patterns, a process which also leads to the continuous “theoretical resampling of data” (Lindberg 2019, p. 7).

Alongside the iterations of discovery and justification, the empirical patterns are then compared to extant theory. To the degree to which the identification and justification of patterns are consistent with each other, but shows discrepancies with extant theory, the need for new, emergence theory grows (Lindberg 2019). According to Lindberg (2019, p. 8), such theory is “a way to craft an account or tell a story that makes sense of the data at hand by shaping a new theoretical account that is consistent with the findings which have been identified and triangulated, whether such a new theory represents an incremental improvement upon extant theory or a rupturing break with extant theory.”

Figure 4.1 below illustrated the analytic process of discovery and justification described in this section adapted from Lindberg (2019).

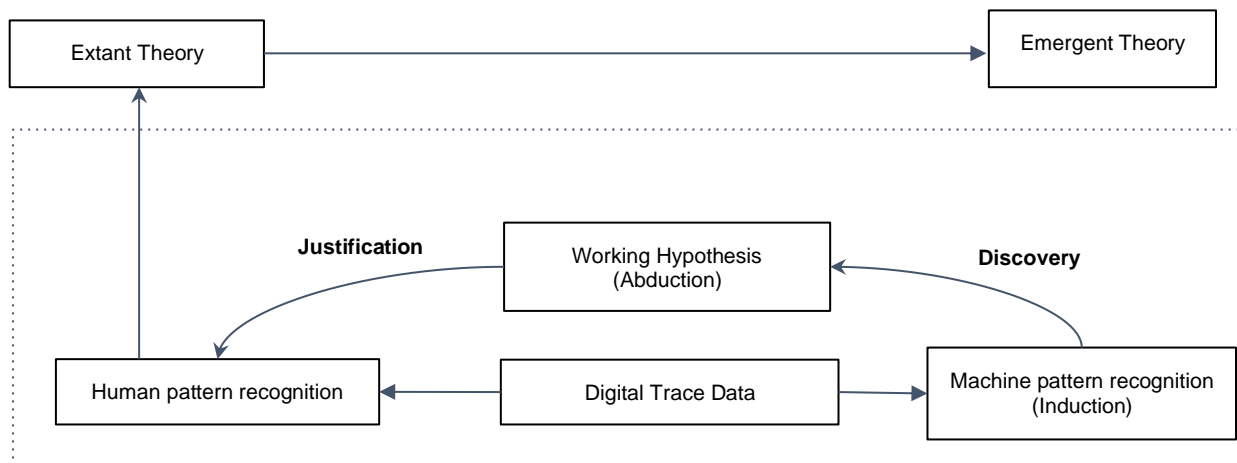


Figure 4.1. Analytics process of discovery and justification adapted from Lindberg (2019)

According to Lindberg (2019), the imaginative faculties of humans are therefore, essential for the act of generating working hypothesis. The next section provides the rationale for inferring patterns of influence from the retweet network. The notion of influence in sensegiving and framing is essential for inferring the existence of influential social actors in the Twitter communications that unfolded in the aftermath of the tragedy. Furthermore, the characterization of influential voices in framing the social tragedy allows us to discuss the political impact of Twitter when it affords diverse actors in society to reach large audiences.

4.5.4 Influence in Sensegiving

Weick et al. (2005, p. 418) discuss the issue of influence in sensegiving in which discussions “tend to assume that meanings survive as a result of voting” where some perspectives become more influential than others. In Twitter networks, users make use of different features, such as retweeting and direct replies, to express their opinions and viewpoints on content available to them through the Twittersphere. Accordingly, retweeting is not just a mechanism for spreading others’ tweet but also a way of participating in a discussion (Boyd and Ellison 2007; Oh et al. 2012). Thus, the frequency of shares that a given message receives (e.g., number of retweets) is representative of a measure of popularity or influence for the message’s content (Kwak et al. 2010; Oh et al. 2012).

This notion of popularity or influence, known as the rich-get-richer model (Easley and Kleinberg 2010, p. 479), has been applied in several studies to identify the existence of influential entities in online environments (Barabási and Albert 1999; Jackson and Rogers 2007), including Twitter networks (Kwak et al. 2010; Oh et al. 2012). The underlying notion is that as users are exposed to vast amounts of content in social media, they apply the heuristic of popularity or influence in deciding to whom or what content they should attend (Miranda et al. 2016). In this way, while social media broadens the participation of civil society in providing perspectives about issues of public concern (Castells 2007; Shirky 2011), social media users’ attention tends to be directed toward common ground—“to discuss

shared rather than unique perspectives” (Miranda et al. 2016, p. 321). In other words, whereas social media enables the involvement of a wide range of individuals in the discussion of public issues, the content created tends to converge towards a lower range of perspectives and opinions.

Using this perspective, the author proposes that in sensegiving, the frequency of shared messages acts as a proxy for inferring a message’s influence. Accordingly, messages with a high frequency of sharing contain high informational and interpretive values given the attention that these messages draw from other social media users (Kwak et al. 2010; Oh et al. 2012; Suh et al. 2010). Appendix 2 presents a short study that elaborates on the technicalities involved in social network analysis and processes of network formation that give rise to influential nodes in a social network.

4.6 Data Collection

Twitter provides an Application Program Interface (API) for retrieving tweets. However, the Twitter’s API imposes limitations that constrain the number of tweets that can be obtained (Jürgens and Jungherr 2016; Weng et al. 2010). To overcome the API’s limitations, tweets can be crawled directly from the Twitter’s website (Weng et al. 2010). Using the Python programming language, the author developed a Web crawler to collect tweets directly from the Twitter’s site using the advanced search functionality provided by the website and under Twitter’s privacy policy (Twitter 2018).

The author collected the data using an iterative sampling approach. Twitter’s search functionality allows keyword searches to retrieve historical data given a range of dates. The author first searched for tweets containing the Spanish keywords for “virgen asunción,” “safe home,” and seven Spanish hashtags reported by newspapers in Guatemala as trends on Twitter related to the tragedy (#ItWasTheState, #NotOneMore, #GuatelnMourning, #WeAreAll40, #WeAreMissing38, #TheGirlsOfGuatemala, #ForTheGirls). In the results of the first search, the author identified two additional hashtags that were also widely used (#SafeHome and #TragedySafeHome) and performed a second search with these hashtags. Since the author was interested in analyzing content in the aftermath of the tragedy, the author only considered tweets posted from March 07 to March 20, 2017. In total, the author collected 11,682 tweets adding a total of 74,586 retweets.

Chapter 5. Findings and Analysis

5.1 Identifying Patterns of Influence

The figure below depicts the retweet network built from the Twitter communications in the aftermath of the Guatemalan tragedy. The nodes represent authors of tweets (tweeters), the edges represent retweets where an edge from authors “A” to “B” symbolizes “A” retweeted “B”’s tweet. The node’s size represents the total number of retweets received by each author’s tweets. In social network analysis, the retweet network represents a “directed network” (Miranda 2018, p. 36) where I regard the frequency of retweeted messages as a measure of “centrality” or prominence of each author. In directed networks in general, “in-degree centrality assesses a node’s popularity” (Miranda 2018, p. 46). In the data, authors with higher values of in-degree centrality captures the notion that some authors have information values or “influential voices in the online community” in that their messages draw public attention from other Twitter users to be retweeted (Oh et al. 2012, p. 5).

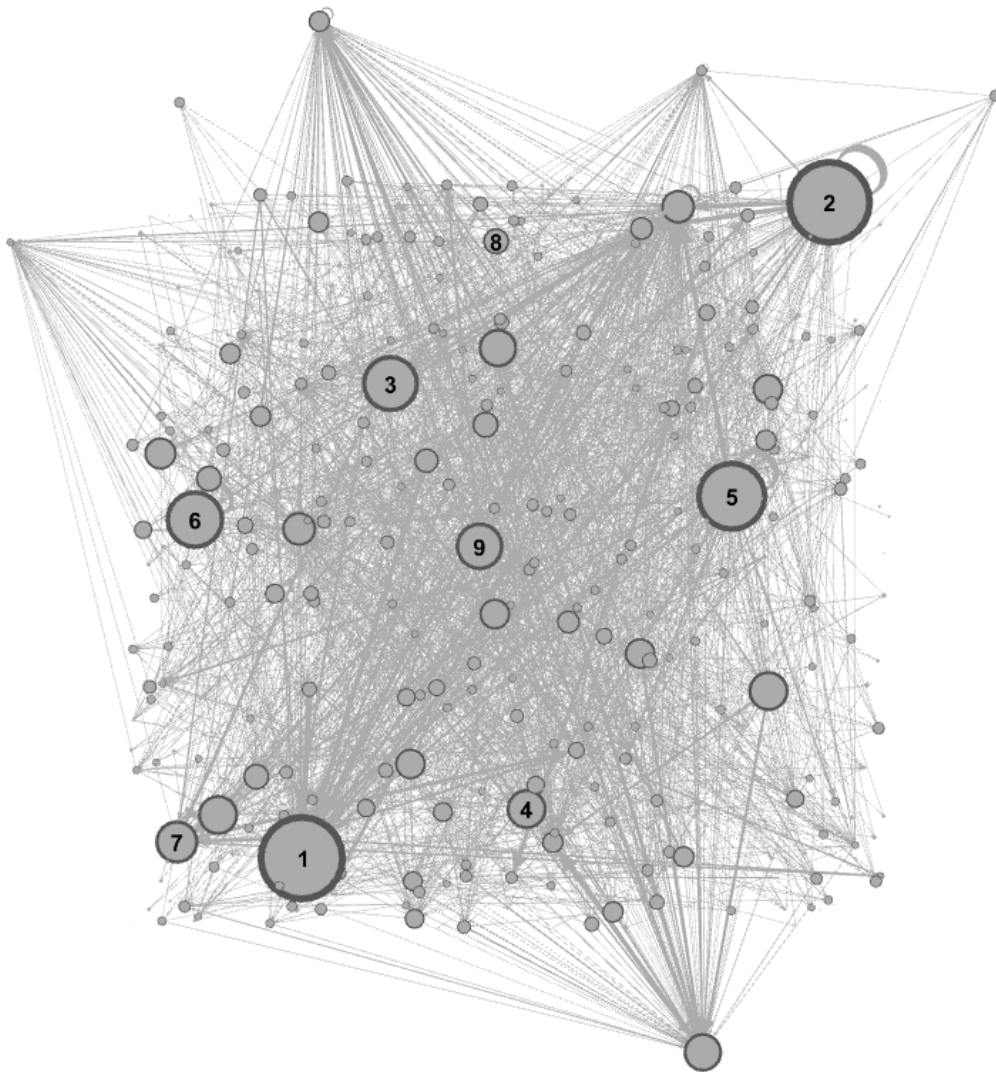


Figure 5.1. Retweet Network

The figure above hints to a scenario in which a few highly influential authors drew most of the attention of the Twitter communications during the aftermath of the tragedy. An examination of the Twitter's profiles of the most influential users in the data reveals that they represent diverse types of local media organizations and activist groups in Guatemala.

Appendixes 3 and 4 present an alternate mechanism for identifying influential authors using unsupervised machine learning techniques and fitting the data to a power-law distribution respectively. In both ways, the identification of influential tweets and who created them also depicts a scenario where diverse media organizations and activist groups took over the most influential roles in the dataset.

Table 5.1. Most Influential Authors

Node in Figure 5.1	Twitter User	# Retweets Received	Number of Twitter Followers (March 14, 2017)	Description
1	Free Press	1,461	1,063,395	Nationwide distributed newspaper and one of the most circulated in Guatemala.
2	Justice Now	747	30,929	Social movement organization concerned with causes of social justice.
3	I Am 502	693	220,926	News media organization.
4	Nomad	592	46,977	News media organization focused in political and social issues.
5	Community Press	436	9,634	News media organization focused in human rights and indigenous people in Guatemala.
6	The Time GT	399	137,615	News media organization.
7	Antigua Channel	327	308,411	TV channel news.
8	United Stations	315	Unknown	Radio channel news.
9	We Are GT	268	Unknown	Political organization.

From this analysis, we can notice the presence of influential users in the Twitter communications that unfolded in the aftermath of the tragedy. Thus, we can infer from the number of retweets that each user received, that few highly influential users drew most of the public's attention in Twitter. The identity of these influential authors is the most interesting aspect of this finding. Free Press is a local newspaper and it is one of the most circulated in Guatemala. In this analysis, the most salient characteristics of Free Press are its high number of retweets and number of Twitter followers. Evidently, Free Press was the most influential actor and had the greatest number of followers as per March 2017.

⁵ <https://www.prensalibre.com/>

Following Free Press, Justice Now⁶ and Nomad⁷ also exhibited high levels of influence. Justice Now is a social movement organization with a political agenda in Guatemala who advocates for causes of social justice. Nomad is a local media organization specializing in the coverage of political and social issues in Guatemala. Justice Now and Nomad are media groups with perspectives that are often critical of the status quo in Guatemalan society, culture, and politics. These media organizations depend solely on ICT, such as social media, for the diffusion of their content. In contrast to Free Press, both Justice Now and Nomad are relatively new in Guatemala and rely only on ICT for reaching and interacting with their audiences. An interesting characteristic of these organizations in the analysis is that their low number of followers in comparison to Free Press.

However, comparable levels of influence exhibited by Free Press, Justice Now, and Nomad allow us to portray these media groups as authors of content that drew significant attention from their audiences in Twitter. Based on these findings, we can infer that *Twitter mediated a space for different types of media organizations to reach an audience and offer diverse types of content and perspectives about the conditions surrounding the tragedy*. This statement is a reasonable inference, that “if true, makes sense of the data at hand” (Lindberg 2019, p. 5). It follows from this the finding of additional patterns that justify the existence of different interpretations of the tragedy facilitated by different types of media organizations.

5.2 Discovering underlying Topics

Social network analysis helped to identify *who* posted the most influential content in the Twitter communications that unfolded during the aftermath of the Guatemalan tragedy. I then turned to understand *what* content was posted with the aim of identifying key concepts emphasized in the Twitter discussions. To do so, I applied diverse approaches of text analysis.

Before applying any text analysis approach to the corpus, I conducted several preprocessing tasks. Preprocessing is a key step in text analysis. Without preprocessing “we are unlikely to detect anything interesting in the corpus” (Miranda 2018, p. 120). I developed a collection of scripts in both Python and R assembled in a pipeline fashion for the implementation of several preprocessing tasks required for the identification of relevant and meaningful terms in the corpus. The table below summarizes the most relevant preprocessing tasks implemented before conducting text analysis.

The first text analysis technique that I applied was word count-based analysis following guidelines from Miranda (2018). Word count-based analysis is useful for understanding “the relative salience of different concepts to a community of authors” (Miranda 2018, p. 98). For the word count-based analysis, I used

⁶ <https://twitter.com/justiciayagt>

⁷ <https://nomada.gt/>

two R packages for text analytics: Text Mining (tm⁸) and Snowball (SnowballC⁹). Word count-based analysis is useful for identifying key concepts emphasized in a text and understanding the “relative salience of different concepts to an author or community of authors” (Miranda 2018, p. 100).

Table 5.2. Main Preprocessing Tasks

1. Transformation of all text to lowercase.
2. Removal of all accents used in the Spanish language.
3. Removal of all references to images.
4. Removal of all references to external websites.
5. Removal of common words and phrases related to the tragedy and that are irrelevant for the exploration of key terms.
6. Removal of punctuation marks.
7. Removal of stop words, i.e., most common words in the Spanish language such as pronouns and articles.
8. Removal of empty spaces such as blank spaces and tabulation.
9. Removal of sparse terms, i.e., terms contained in most tweets.

I begin with a graphic representation (word cloud) of the frequency with which terms (in Spanish) appear in the Twitter data. The word cloud presents different terms carrying different sentiments. The biggest word at the middle, which stands for “it was the state” has a stronger sentiment than other more neutral terms like “tragedy” or “the girls of Guatemala.” While social network analysis techniques were useful for analyzing the structure of the Twitter communications that unfolded in the aftermath of the tragedy, text analysis approaches, such as word clouds, were useful for analyzing the content of those communications.



Figure 5.2. Word Cloud

⁸ Tm: Text Mining Package. A framework for text mining applications within R. <https://cran.r-project.org/web/packages/tm/index.html>.

⁹ SnowballC: Snowball Stemmers Based on the C 'libstemmer' UTF-8 Library. An R interface to the C 'libstemmer' library that implements Porter's word stemming algorithm for collapsing words to a common root to aid comparison of vocabulary. <https://cran.r-project.org/web/packages/SnowballC/index.html>.

Using R for examining the frequency of all words in the corpus, the table below depicts the most frequent words and their frequencies.

Table 5.3. Key Terms in the Twitter Communications about the Tragedy

Word	Frequency	Word	Frequency
#ItWasTheState	2500	Minors	407
#TheGirlsOfGuatemala	1317	#NotOneLess	295
Girls	1074	Death	271
#NotOneMore	664	#ForTheGirls	270
#Guateln Mourning	630	@jimmymoralesgt	265
Tragedy	610	President	199
Justice	540	Adolescents	197
#TragedyHogarSeguro	432	Children	181
Fire	429	Case	169
Victims	415	Women	162

We can observe that several hashtags appear as key terms in the Twitter communications about the tragedy. Hashtags such as #ItWasTheState, #NotOneMore, and #NotOneLess express an intense sentiment. #ItWasTheState clearly points out at the Guatemalan state as culprit of the tragedy whereas #NotOneLess and #NotOneMore signals intolerance towards the death of the girls. Based on these hashtags, we can distinguish the prevalence of tweets expressing explicit accusations about those responsible for the tragedy and tweets emphasizing the incidence of an unjust act in the entire corpus. The hashtag #ForTheGirls is also indicative of motivational content that aims at incentivizing the public to act in defense of the girls.

Word frequency approaches give us a broader understanding of popular terms in the corpus but fall short of describing how terms relate to each other and underlying topics or key themes that dominated the Twitter communications. Thus, I applied the LDA topic modelling approach following guidelines from Miranda (2018) for discovering underlying topics that occur in the corpus. Topic modelling is a more complex approach for finding semantic structures in a body of text (Miranda 2018).

When applying this approach to the Twitter data, the outcome are clusters of tweets that contain similar terms where each cluster corresponds to a topic. The table below shows the results of applying topic modelling to the corpus using the “LDA approach” (Miranda 2018, p. 182), which consist of four topics. This table also displays the most frequent and representative terms under each topic. Furthermore, topic modelling is not only useful for discovering underlying topics in the tweets, but it also serves as a classification technique to group tweets into a single topic (Miranda 2018).

Table 5.4. Output of LDA Topic Modelling

Topic 1	Topic 2	Topic 3	Topic 4
virg�n	#TheGirlsOfGuatemala	#ItWasTheState	#SafeHome
asunci�n	#NotOneMore	#Guatemala	girls
safe home	Guatemala	#TragedySafeHome	#MourningGuate
home	justice	#ForTheGirls	death
tragedy	more	@jimmymoralesgt ¹⁰	via ¹¹
fire	girls	president	adolescents
minors	#NotOneLess	#MourningGuatemala	children
victims	today	government	#TragedySafeHome
deceased	front	#GuatemalaIsInMourning	case
house	women	social	@pdhgt ¹²

According to Miranda (2018), topic modelling provides a mechanism for summarizing text in a large corpus. The table above describing the output of the LDA topic modelling approach allow us to interpret the tweets in the corpus as follows:

The tweets related to the tragedy can be classified into four topics according to the terms used in each tweet. The tweets classified under topic 1 used terms like “virg n”, “asunci n”, “safe home”, and “tragedy” more frequently than tweets classified under the other topics. In a similar fashion, tweets classified under topic 2 used terms like #TheGirlsOfGuatemala and #NotOneMore more often. Tweets classified under topic 3 used terms like #ItWasTheState and #ForTheGirls more frequently. Finally, tweets classified under topic 4 used terms like #SafeHome and #MourningGuate more often.

Also, topic modelling allows the association of the same term to more than one topic (Miranda 2018). For example, the term “girls” appears as a frequent term in topics 2 and 4. Such feature of topic modelling allows the association of terms that could be used in different ways in different topics. Therefore, the interpretation of the results of topic modelling depends on the meanings of all the terms in the list of frequent terms in each topic and a close examination of the documents or messages carrying those terms.

The grouping of tweets by topic modelling according to the most frequent terms used in each tweet can be used to identify underlying or hidden semantic structures in the corpus. This approach builds on the intuition that if a message or document is about a particular topic, then it is expected that particular terms will appear in the document more frequently (Miranda 2018). For example, the terms “president” and “government” will appear more often in messages about the president, the terms “girls” and

¹⁰ @jimmymoralesgt is a reference to the president of Guatemala at the time.

¹¹ The term “via” is commonly used to cite the author or source of the information presented in the tweet

¹² Reference to the Human Rights Office in Guatemala.

“women” will appear more often in messages about the girls, and the terms “the” and “is” will appear equally in both. In the next paragraphs, I discuss more in detail the outcome of the topic modelling and the interpretation of the topics revealed by this approach.

Table 5.5 Exemplary tweets under Topic 1

Topic 1
Now, a lot of tension between the minors of the care home "virg�n de la asunci�n" and riot agents
According to the police, dozens of girls escaped from the care home "virg�n de la asunci�n", but they still have to quantify
Minors report abuse in care home "virg�n de la asunci�n"
The police confirms the escape of several girls from the care home "virg�n de la asunci�n"
Fifty teenagers escape from the care home "virg�n de la asunci�n"
Now, increases to 22 the number of children killed in the care home "virg�n de la asunci�n"
A young woman lights a candle in homage to the 21 deceased girls in the care home "virg�n de la asunci�n"
Relatives wait for information in front of the care home "virg�n de la asunci�n"
19 minors die in the care home "virg�n de la asunci�n" and 12 die in hospitals leaving a balance of 31 fatalities
Author of Harry Potter gives her regret and writes a column for the tragedy of the care home "virg�n de la asunci�n"

Topics 1 and 4 exhibit a variety of terms describing general aspects of the tragedy. The table above contains 10 exemplary tweets classified under topic 1. The tweets in this table contain several of the most frequent terms of topic 1, such as “virg n”, “asunci n”, and “tragedy.” A close examination of the tweets classified under topic 1 reveals these messages concerned with reporting on what happened in the care home and during the aftermath. For example, some of these tweets report on the number of victims and police statements about the incident. Also, many of the tweets belonging to topic 1 are factual, i.e., consist of what happened during or after the fire, rather than interpretations or subjective claims about the tragedy.

The table below contains 10 exemplary tweets classified under topic 4. Like topic 1, tweets classified under topic 4 seem to be also factual messages about the tragedy. However, by looking at some of the most frequent terms of topic 4 (e.g., #SafeHome and #TragedySafeHome) and after a close examination of the tweets under this topic, these tweets report on the tragedy in a slightly different way. The tweets in topic 4 used hashtags more frequently than tweets under topic 1. Semantically, the tweets in topic 4 are similar to the tweets in topic 1. However, the frequent use of hashtags affected the way in which the topic modelling LDA algorithm performed the classification of tweets into two distinct topics. A preprocessing task that transforms hashtag terms like #SafeHome into standard written human language like “safe home” could yield an even more accurate representation of underlying topics in the corpus. However, as discussed later, some hashtags in the data carry interesting meanings that are lost when breaking the hashtag into its constituent terms. For this reason, I decided to preserve all hashtags in the input to the topic modelling approach. Future research could explore the implementation of more sophisticated preprocessing tasks that could enhance the accuracy of the topic modelling approach in these cases.

Table 5.6. Exemplary tweets under Topic 4

Topic 4
#NowFP ¹³ @pdhgt verifies situation in care home "virgén de la asunción". They talk with children, adolescents, and authorities of the place.
The number of girls and adolescents killed today by the fire rises to 21 in the #SafeHome. News at 9 pm.
#NowFP. Commemorative events in the #InternationalWomensDay call for justice and punishment for the girls of #SafeHome
Prosecutors of femicide, crimes against life, childhood, and adolescence work in #SafeHome
#SafeHome Some minors, who are in a state of pregnancy, are transferred to health centers
#TragedySafeHome Disavowal for the deaths of teenagers in care home is widespread
#CommunityGT under the motto #ItWasTheState will protest for the tragedy in #SafeHome
Hospital directors warn that girls in treatment are 80% more likely to die #TragedySafeHome
The Latin American and Caribbean network for the defense of children said that the #TragedySafeHome was avoidable
Groups carry out marches in #Xela ¹⁴ for the death of children in the home #TragedySafeHome

The meaning of the frequent terms under topics 1 and 4 and the close examination of tweets under topics 1 and 4 suggest the underlying topic or theme under these tweets relates to facts about the tragedy. In other words, tweets under topics 1 and 4 aim to present factual descriptions of the events surrounding the tragedy. Additionally, the difference between the tweets under topics 1 and 4 is the use of hashtags. Under topic 4, tweets tend to include more hashtags than tweets under topic 1. For this reason, I label topic 1 as “tragedy reporting” and topic 4 as “tragedy reporting with hashtags.”

Following with the interpretation of the topics revealed by the topic modelling approach, terms under topic 2, such as “#TheGirlsOfGuatemala”, “#NotOneMore”, “justice”, and “#NotOneLess” seem to converge into a theme that centers on the victim girls who died as consequence of the fire. The table below presents 10 exemplary tweets classified under topic 2. These tweets exhibit a focus on the girls as victims of the incident. In contrast to topics 1 and 4, topic 2 tweets hardly convey a sense of objectivity. Unlike topics 1 and 4 which centered on factual descriptions of the tragedy, topic 2 is highly loaded with sentiments of outrage and solidarity. The underlying theme of the tweets under topic 2 emphasizes the girls as victims of a dreadful incident. For this reason, I label topic 2 as “victims of the tragedy.”

¹³ “NowFP” stands for “Now Free Press.”

¹⁴ Xela is the name of the second largest city in Guatemala.

Table 5.7. Exemplary tweets under Topic 2

Topic 2
The one who calls to dialogue and asks for a voice, but at the same time attacks and sexualizes, deserves disapproval and rejection. #NotOneMore
It hurts each of the 37 #TheGirlsfGuatemala #ItWasTheState
#TheGirlsfGuatemala #ItWasTheState We mourn our 31 dead little sisters of Guatemala
#TheGirlsfGuatemala 37 dead are all valuable lives. #ItWasTheState
How the soul of a society that has been outraged since its inception is cured? #GuatelsInMourning #TheGirlsfGuatemala
#TheGirlsfGuatemala Infinite solidarity. Total repudiation. #NotOneMore
What were you doing at 11 12 13 14 15 or 16 years old? Join the action. #TheGirlsfGuatemala #WeAreAll40
#TheGirlsfGuatemala Women supporting other women. A group of women supporting families in hard times.
When I was 13, I was a girl who was fortunate to not be deprived of just being a girl. #WeAreAll40 #TheGirlsfGuatemala
At 16 years old, I graduated from high school. I was lucky. But we could all be they. #TheGirlsfGuatemala #WeAreAll40

Finally, Topic 3 groups terms such as “Guatemala”, “president”, and “government” referring to the Guatemalan government in different ways. The hashtag “#ItWasTheState” was the most frequent term in topic 3, and conveys a strong sense of accountability by pointing out at the Guatemalan state as culpable of the tragedy. The table below presents 10 exemplary tweets classified under topic 3. These tweets exhibit a focus on the government and government officials as culprits of the incident. In contrast to topics 1 and 4, and like topic 2, topic 3 tweets tend to be subjective. Furthermore, topic 3 engages in a more extreme view of the tragedy, inciting defiant attitudes against the Guatemalan government. The underlying theme of the tweets under topic 3 focus on the government as responsible for the tragedy. For this reason, I label topic 3 as “Responsible for the Tragedy.”

Table 5.8. Exemplary tweets under Topic 3

Topic 3
They weren't quiet, they didn't like that. They defended their rights and the state burned them. #ItWasTheState
The case care home "virg�n de la asunci�n" is a sign that the ineptitude of the president is not a reason for jokes, is costing lives. #JusticeNow
The government can't wash their hands with the #TragedySafeHome. They were supposed to protect those girls and adolescents.
#ItWasTheState The people here have no president. Failed state you're a murderer. It wasn't an accident, it was an execution
Guatemala you hurt me in the soul. You kill your people. You repress the poor and praise the rich. #ItWasTheState
The lack of clarity of @jimmymoralesgt. #ItWasTheState
34 were the victims that resulted from a state that guarantees absolutely nothing. Jimmy is inept. #ItWasTheState
It was not an accident. It was not negligence. #ItWasTheState @jimmymoralesgt, get out killer
It is the fault and responsibility of the state. No one else. #ItWasTheState #GuatemalaInMourning
An absent president. A president without answers. #SafeHome #GuatelsInMourning

The table below presents the output of the topic modelling approach where each topic is labelled with a descriptive name according to meaning of the tweets under the topic and most frequent terms. The labels reflect different themes in the data suggesting different types of content governing the Twitter

communications in the aftermath of the tragedy. Also, for illustration purposes, I colored topics 1 and 4 with a grey color, topic 2 with a light red color, and topic 3 with an intense red color. The existence of different underlying topics in the tweets is important, because at this point, the interpretation of the data starts to point at the existence of different types of content carrying diverse meanings disseminated through the Twittersphere. The meanings of the tweets under topics 1 and 4 align with a neutral depiction of the tragedy based on factual statements. Tweets under topics 2 and 3 align more with a subjective account based on the victimization of the girls and accusations against the Guatemalan government.

Table 5.9. Topics Identified from Topic Modelling

Topic 1: Tragedy Reporting	Topic 2: Victims of the Tragedy	Topic 3: Responsible for the Tragedy	Topic 4: Tragedy Reporting using Hashtags
virgén	#TheGirlsGuatemala	#ItWasTheState	#SafeHome
asunción	#NotOneMore	#Guatemala	girls
safe home	Guatemala	#TragedySafeHome	#MourningGuate
home	justice	#ForTheGirls	death
tragedy	more	@jimmymoralesgt	via
fire	girls	president	adolescents
minors	#NotOneLess	#MourningGuatemala	children
victims	today	government	#TragedySafeHome
deceased	front	#GuatemalaIsInMourning	case
house	women	social	@pdhgt

Next, I combined the results of topic modelling with the results of the social network analysis to develop a better understanding of the role of the most influential actors by looking at the content they created. The figure below illustrates the combination of the outcome of the topic modelling with the results of the social network analysis. To generate this figure, I applied the heuristic of labelling and coloring each author with the type of content that dominated all the tweets created by the author. For example, most of the tweets created by Justice Now (node identified with number 2 in Figure 5.3) were classified under topic 3, thus, this author appears in Figure 5.3 as authoring content belonging to topic 3 (i.e., Justice Now is colored with an intense red color). However, it is important to note that this does not mean that all tweets by this user belong to topic 3.

The most interesting insight revealed by Figure 5.3 is the quality of the data of being divisible into different themes that broadly describe diverse communicative goals. Figure 5.3 shows the existence of three wide-ranging types of content dominating the Twitter communications in the aftermath of the tragedy that focused on objective reporting of the tragedy and subjective claims about the victims of the tragedy and those allegedly responsible for the tragedy.

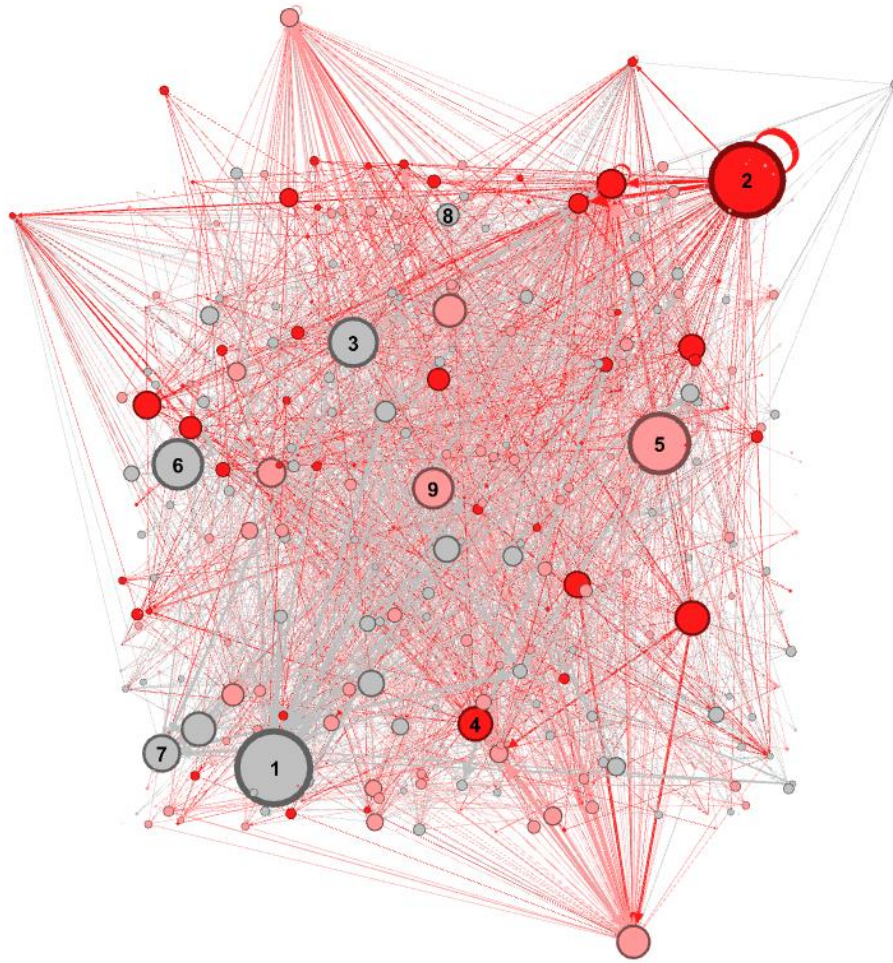


Figure 5.3. Topical Influential Actors

Table 5.10. Most Influential Authors

Node in Figure 5.3	Twitter User	Media Channel	Media Type	Dominant Topic
1	Free Press	Newspaper	Traditional	Tragedy Reporting
2	Justice Now	Social Media	Alternative	Responsible for the Tragedy
3	I Am 502	Website	Traditional	Tragedy Reporting
4	Nomad	Website	Alternative	Responsible for the Tragedy
5	Community Press	Newspaper	Alternative	Victims of the Tragedy
6	The Time GT	Newspaper	Traditional	Tragedy Reporting
7	Antigua Channel	Television channel	Traditional	Tragedy Reporting
8	United Stations	Radio station	Traditional	Tragedy Reporting
9	We Are GT	Website	N/A	Victims of the Tragedy

The table above includes the media channel or medium used in reaching an audience of the most influential users, and whether the media channel is traditional or alternative. As mentioned before, different media organizations exhibited similar levels of influence. *Based on the results of the topic modelling approach, I argue that several media organizations engaged in the production of different types of content and meanings of the tragedy.* More importantly, such analysis reveals the capacity of social media, Twitter in this case, for creating a space for new forms of media, relying exclusively on online means for reaching an audience, to offer different types of content from traditional media. Appendix 5 offers a complementary analysis showing how Twitter's features (e.g., tweets, retweets, links, and hashtags) were used in the Twitter communications that unfolded in the aftermath of the tragedy.

5.3 Classification of Influential Authors

Based on the salient features of the Twitter communications that unfolded in the aftermath of the tragedy revealed by social network analysis and topic modelling, I classified the identity of influential authors into classes of either traditional media or an alternative media genre.

Free Press, I Am 502, The Time GT, Antigua Channel, and United Stations are examples of traditional media organizations. Justice Now, Nomad, and Community Press represent what Lievrouw (2011) calls alternative media. Furthermore, these alternative media outlets represent different genres of alternative media. Justice Now is a social movement organization that aligns with the genre of mediated mobilization because it uses ICT for promoting causes of political change. Justice Now is an active group in Guatemala who often calls for crowd protests as means for demanding political change. On the other hand, Nomad and Community Press align with the genre of critical journalism because they often engage in perspectives that are critical of power elites and the political class in Guatemala. Both Nomad and Community Press adopt practices of professional journalism to produce articles that often discuss social issues in Guatemalan society considered taboo or controversial in Guatemalan society.

The table below summarizes the classification of influential authors into a class representing their media genre according to Lievrouw (2011)'s topology of alternative media and the traditional media type. In the table below, I have excluded the author We Are GT. We Are GT is a political organization that does not exhibit the features of any form of alternative media. Furthermore, We Are GT as a political organization, may have partisan views of the events in Guatemala. Therefore, the content created by We Are GT does not align with the conceptual basis of this thesis which focuses on media organizations as authors of content about the tragedy.

Table 5.11. Classification of Influential Media Organizations

Twitter User	Media Type
Free Press	Traditional
Justice Now	Mediated Mobilization
I Am 502	Traditional
Nomad	Critical Journalism
Community Press	Critical Journalism
The Time GT	Traditional
Antigua Channel	Traditional
United Stations	Traditional

The application of different social analytics techniques to the Twitter data was useful for discovering general semantic structures governing the data. Although the topic modelling approach revealed interesting patterns in the data that were useful for differentiating the content created by different types media organizations, it fails to convey an explanation of the meanings in each tweet. Indeed, when using topic modelling, and machine-learning algorithms in general, “a dedicated explanatory phase is therefore vital for ensuring the interpretability of predictive models” (Müller et al. 2016a, p. 294). To gain a deeper understanding of the meanings disseminated in the aftermath of the tragedy via Twitter, I manually analyzed and coded (i.e., human pattern recognition) a total of 65 tweets created by three influential media organizations: Free Press (traditional media), Nomad (critical journalism genre of alternative media), and Justice Now (mediated mobilization genre of alternative media). I limited the manual analysis to the content created by these three organizations because they are the most influential authors who represent different types of media organizations and created different types of content.

In the manual analysis, I excluded the authors I am 502, The Time GT, Antigua Channel, United Stations, and Community Press. I Am 502 is a traditional media organization that provides news around a wide range of topics including sports, technology, shows, and culture in Guatemala. Furthermore, a close reading of the tweets created by this author, and as Figure 5.3 shows, I Am 502 engaged in the creation of content similar to Free Press and did not provided new insights or meanings around the tragedy. Furthermore, the content created by I Am 502 does contain new information relevant to the aim of this thesis which is to develop a better understanding of the political role of social media in emerging democracies. Thus, despite the high levels of influence exhibited by the content authored by I Am 502, I have decided to exclude this author from further analysis. Likewise, I also excluded the authors The Time GT, Antigua Channel, and United Stations because their content echoed the messaging authored by Free Press. In a similar fashion, I also excluded Community Press because the content created by this organization echoed some of the views authored by Nomad and Justice Now.

5.4 Abstraction and Generalization of Influential Tweets

The goal of the manual analysis was to gain a deeper understanding of the tweets authored by Free Press, Nomad, and Justice Now. This analysis consisted of explaining the meaning of each of these tweets using the concept of frame, i.e., the interpretation of the tweet as a message that emphasized some aspects of the tragedy and downplayed or ignored others. The wide-spanning themes identified by the topic modelling approach paved the way for the manual analysis of the tweets authored by these three media organizations. Figure 5.4 (a) below expands on the data presented in Table 5.10 and shows in more detail the topics of the tweets authored by Free Press, Nomad, and Justice Now that resulted from the topic modelling analysis.

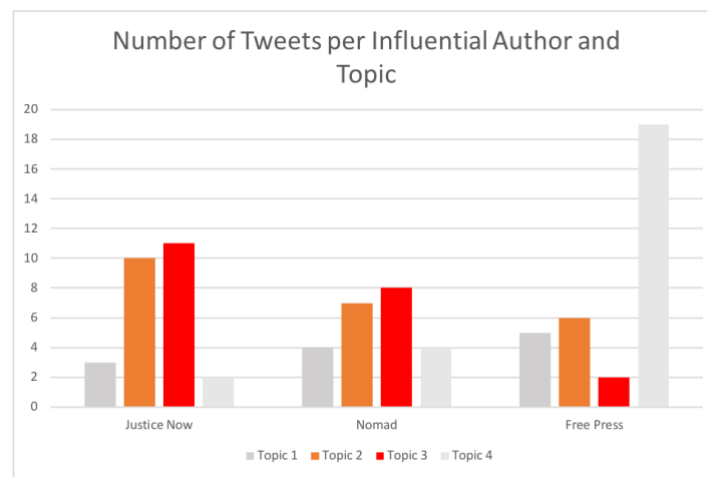


Figure 5.4 (a). Topics by Influential Author

5.4.1 Manual Analysis of Tweets by Influential Authors

Free Press

First, I performed a tweet-by-tweet examination of the tweets authored by Free Press. Based on the topic modelling analysis, Figure 5.4 (a) shows that the dominant topic in the tweets authored by Free Press is topic 4 (tragedy reporting with hashtags). The most frequent terms under the tragedy reporting topic (Tables 5.4 and 5.9) exhibit a variety of terms used for the reporting of the tragedy. These terms and the exemplary tweets examined under topic 4 (Table 5.6) suggest that tweets authored by Free Press consisted of factual messages informing about conditions and events surrounding the tragedy.

To achieve the goal of explaining each tweet authored by Free Press using the concept of frame, I proceed to explain the use of the most frequent terms shown in Tables 5.4 and 5.9 for topic 4. The tweets authored by Free Press included purely descriptive terms like “#SafeHome”, “girls”, “#MourningGuate”, “death”, “via”, “adolescents”, “children”, “#TragedySafeHome”, and “case” because these tweets fulfilled the communicative goal of constructing an impartial understanding of the tragedy. The reason why these tweets denote an impartial or neutral stance is that they aimed at informing the public about the tragedy. Drawing on the description of informative frames discussed in section 3.5.1,

tweets authored by Free Press performed the role of informing the public about the tragedy by following a logical structure that is independent of the opinions or viewpoints. The tweet in example 1 presented in section 3.5.1 and the tweets shown in Figures 5.5 and 5.6 represent content authored by Free Press that maintain objectivity and lack any opinion or viewpoint in its messaging.

In addition to the communicative goal of constructing an impartial understanding of the tragedy, these tweets also helped to reduce rumoring and the spread of fake news by exhibiting properties of source reliability, i.e., author's reputability and verifiable sources (Table 3.2). Free Press is one of the most popular newspapers in Guatemala and most Guatemalan people regard it as a reliable source of news. Therefore, I regarded tweets authored by Free Press as exhibiting author's reputability. Also, many tweets authored by Free Press included visual content to support the messaging in the tweets that I regarded as verifiable sources.

Based on the communicative goal of the tweets authored by Free Press of constructing an impartial understanding of the tragedy and their properties to reduce rumoring and the spread of fake news, I conceptualized these tweets as informative frames (Table 3.2). Informative frames comprised descriptions of the events that unfolded in the aftermath of the tragedy and reports explaining the background of the care home. Also, informative frames resembled news reports that summarized the events without making judgments on those responsible or expressing sentiments of dissent.

Nomad and Justice Now

Then, I performed a close examination of the tweets authored by Nomad and Justice Now. Based on the topic modelling analysis, Figure 5.4 (a) shows that the dominant topic in the tweets authored by Nomad and Justice Now is topic 3 (responsible for the tragedy) closely followed by topic 2 (victims of the tragedy). The most frequent terms under these topics (Tables 5.4 and 5.9) include hashtags making argumentative claims such as "it was the state", "for the girls", "Guatemala is in mourning", "not one more", "justice", and "not one less." These terms and the exemplary tweets examined under the topics 2 and 3 (Tables 5.7 and 5.8) suggest that content authored by Nomad and Justice Now aimed at persuading the reader that the tragedy was not an accident but the outcome of an outrageous and deliberate act.

To fulfill the same goal of explaining each tweet authored by Nomad and Justice Now using the concept of frame, I proceed to explain the use of the most frequent terms shown in Tables 5.4 and 5.9 for topics 2 and 3. The tweets authored by Nomad and Justice Now included these terms because these tweets attempted to persuade the public to believe that the tragedy represented a problematic and unacceptable condition in society that cannot be left unsolved. In contrast to the tweets authored by Free Press, the reason why these tweets engaged in a persuasive stance is that they made moral judgments by evaluating causal agents and the effects of their actions. Also, drawing on the description of persuasive frames discussed in section 3.5.1, tweets authored by Nomad and Justice Now performed the role of persuading the public about who were the culprits and victims of the tragedy by expressing feelings, attitudes, and opinions. The tweet in example 3 presented in section 3.5.1, the tweets in Figure

5.9, and the tweets in examples 1 to 5 in subsections 5.4.4 and 5.4.5 represent content authored by Nomad and Justice that express subjectivity in its messaging.

Based on the communicative goal of the tweets authored by Nomad and Justice Now of persuading the public to believe that the tragedy embodied a dreadful condition, I conceptualized these tweets as persuasive frames (Table 3.2). Persuasive frames comprised argumentative claims about the victims and culprits of the tragedy. Furthermore, persuasive frames simplified aspects of the tragedy in ways that were comprehensible and relevant for people that were not related to the tragedy. In this way, persuasive frames enabled individuals to identify and connect the tragedy within their daily life experiences. Subsections 5.4.4 and 5.4.5 explain more in detail the properties of centrality regarding beliefs and values, experiential commensurability, and empirical credibility (Table 3.2) exhibited by the persuasive frames authored by Nomad and Justice Now.

In a second round of analysis focusing on persuasive tweets revealed that these frames exhibit two dimensions: (1) *victimization*: the girls as victims of an injustice and (2) *causality*: the culprits of the incident. Tweets that focused on the girls as victims claim that an injustice has been committed. Thus, I refer to this type of tweet as *injustice* frames. The second dimension stressed by the *persuasive* frames referred to explicit accusations about those responsible for the tragedy. Thus, I refer to this type of tweets as *accusatory* frames.

In summary, the analysis in this section describes tweets authored by Free Press informative frames that aimed to inform the public about the tragedy by revealing specific aspects of the tragedy. This analysis also describes tweets authored by Nomad and Justice Now as persuasive tweets that aimed to persuade the public about the victims and culprits of the tragedy. The analysis discussed in this section provided the basis for constructing the theoretical framework (Table 3.2) presented in the literature review chapter.

5.4.2 Summary of Manual Analysis

Figure 5.4 (b) below summarizes the results of the manual analysis and quantifies the number of tweets authored by each influential author and its associated media genre. Appendix 6 contains a sample of 30 tweets with the results of the coding used to derive the charts in the figure. In contrast to Figure 5.4 (a), Figure 5.4 (b) shows a more nuanced account of the meanings revealed through the manual analysis of the tweets authored by Free Press, Nomad, and Justice Now.

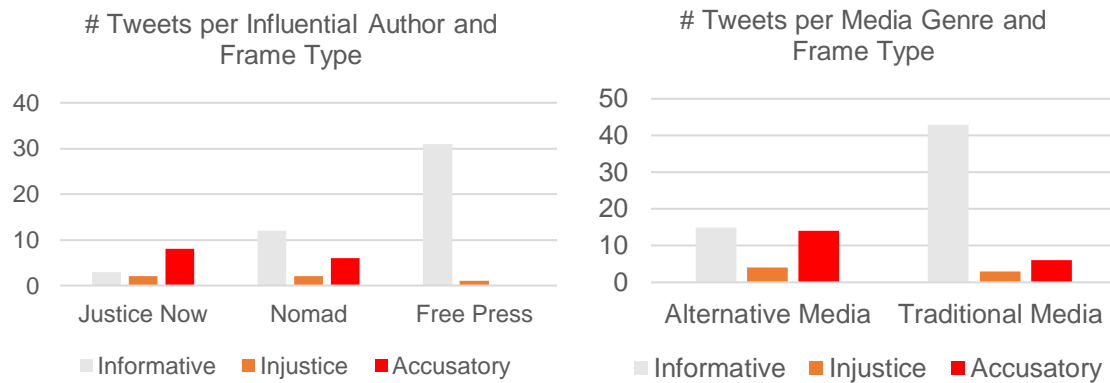


Figure 5.4 (b). Frame Types by Influential Author and Media Genre

The authoring of *accusatory* frames by alternative media organizations expresses oppositional standpoints that question the legitimacy of public authorities. The journalistic production of accusatory frames causes insights that allow the general public to challenge “the current system of governance” (Fuchs 2010) and paves the way for collective action that aims to “change prevailing political conditions” (Lievrouw 2011, p. 149). Similarly, the production of informative frames by alternative media attempts to transcend the filtering and censorship of news stories by information monopolies that “prevent critical views of the current political system” (Downing 2001, p. v). The traumatic story described later in Figure 5.8 is an excellent example of an informative frame authored by an alternative media organization that established the empirical referents for further frames that conveyed sharp criticism of public authorities. In the following subsections, I provide examples that describe in detail the different types of frames derived from the manual analysis described in this section.

5.4.3 Informative Frames

In this subsection, I focus on informative frames. Informative *tweets* represent frames aimed at informing the general population about the tragedy by providing content based on facts. Informative tweets were the first messages to spread through the Twittersphere, emerging before the appearance of any other form of content. These tweets were posted by news media immediately after the fire in the care home.

Mujer hace serios señalamientos en contra del personal a cargo del cuidado de los menores en el Hogar Seguro Virgen de la Asunción.



9:15 AM - 8 Mar 2017

38 Retweets 37 Likes

Hasta el momento se confirman 19 personas sin vida en el interior del Hogar Seguro Virgen de la Asunción en San José Pinula.



8:57 AM - 8 Mar 2017

39 Retweets 20 Likes

“Woman makes serious accusations against the personnel in charge of the care of the minors in the home Virgen de la Asunción.”

Traditional media organization

“So far, 19 people without life have been confirmed inside the home Virgen de la Asunción in San José Pinula (location of the home).”

Traditional media organization

Figure 5.5. Example of *informative* tweets

The figure above presents two *informative* tweets posted just a few moments after the fire. The author of these tweets corresponds to United Stations, a popular radio station in Guatemala. The tweet to the left plays a video describing the ill-treatment that girls received in the center by one of the mothers of the victims. The tweet to the right reports the number of casualties, showing photographs of the home after the fire, including the room where the fire happened. The evidence provided in these messages in the form of photographs and videos of eyewitnesses’ testimonies is an excellent example of how media organizations tap into the features of Twitter for augmenting the veracity of their tweets while avoiding rumoring and the spread of fake news.

The figure below depicts an informative tweet posted by Free Press five hours after the firefighters extinguished the fire. This tweet contains a video that describes the main details of the tragedy. In a similar vein to the previous tweets, this tweet carries content aimed at explaining what happened by describing the background of the care home and the causes of the fire.

The tweets depicted in the two figures above are examples of news stories that fulfil the function of informing the civil society that something unexpected and tragic has happened. These tweets also highlight abnormalities in the circumstances surrounding the fire. They contribute to fulfilling the goal informing by providing impartial explanations of the incident.

¿Qué pasó en el Hogar Virgen de la Asunción? ¿Cuál fue la causa? ¿Qué antecedente tenía el lugar? A continuación se lo detallamos:



Traditional media organization

English translation:

Tweet text: *“What happened in Hogar Virgen de la Asunción? What was the cause? What background did the place have? We will detail it below.”*

Text appearing in the video:

“More than 600 girls and adolescents were under the tutelage of the State.”

“The Secretariat of Social Welfare received children and adolescents from 0 to 18 years old, victims of violence.”

“The girls who lived in the home were not guilty, and did not arrive there to fulfil a corrective sentence.”

“Since 2015, the household has begun to become notorious for the mistreatment, overcrowding, and recruitment of minors for sex trafficking.”

“The girl victims raised their voices, and others decided to flee.”

“60 women escaped on Tuesday, and this Wednesday 19 died after a tragic fire.”

Figure 5.6. Example of an *informative* tweet

As information continued to flow through the Twittersphere, news stories started to emerge making accusations against the managers of the care home and government officials, including the President of Guatemala. Since the care home is directed by the Secretary of Social Welfare of the Presidency, the Human Rights Office in Guatemala accused both the authorities of the care home and the Secretary of Social Welfare for failing to take the necessary measures to secure the life of the minors living at the center. As a response, the managers responsible for operating the care home blamed the girls for being conflictive and initiating a riot at the center. Several news stories circulated through the Twittersphere reproducing statements from the Guatemalan President about the tragedy. According to these statements, the President called on the public conscience to accept the tragedy as the inevitable result of the problems that plague the country.

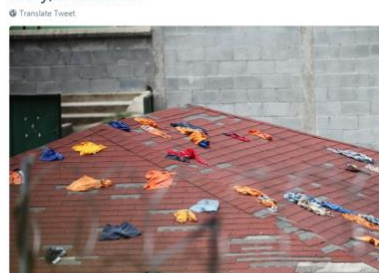
#GuateDeLuto | Unicef y PDH habían denunciado la situación del #HogarSeguro ▶ bit.ly/2m3flcS



6:53 AM - 9 Mar 2017

53 Retweets 45 Likes

#GuateDeLuto | #HogarSeguro tenía a las niñas bajo llave, según la PHD ▶ bit.ly/2mnYNUb



3:10 PM - 9 Mar 2017

6 Retweets 6 Likes

"The President Hands Out Responsibilities"

"The President said that all Guatemalans have responsibility of the nation we have built, and I believe that we must all take seriously what happened and the extremes that have to happen for us to react and pay attention to the serious problems."

"The United Nations Children's Emergency Fund and the Human Rights Office had denounced the situation at #SafeHome."

Traditional media organization

Users' Comments:

"I do not understand how the Human Rights Office argues that with a recommendation they wash their hands."

"The Human Rights Office always denounces but nothing effective; There is never a follow-up."

"#SafeHome had the girls locked, according to the Human Rights Office."

Traditional media organization

Users' Comments:

"In this tragedy, all the politicians who have to deal with these institutions are responsible."

"How is that we are all responsible? I do not accept that responsibility as a citizen. The incapable government is responsible."

Figure 5.7. Example of two *informative* tweets and users' comments

The figure above contains two *informative* tweets, authored by the same local newspaper of the tweet in Figure 5.5, including links to more extensive news articles that inform the public about the statements spoken by public authorities in Guatemala. The article also includes comments made by the Guatemalan President about the tragedy (shown to the right). The texts at the bottom of each tweet include users' comments expressing dissent and rejection of the attitudes taken by public authorities.

At the same time, more information regarding the living conditions of the girls at the care home came to light. Some informative frames presented a more in-depth story about the possible causes and background of the tragedy. The figure below shows a tweet linking to an article¹⁵ explaining the causes of the revolt that preceded the fire. The tweet was authored by Nomad, the media group considered previously in this section as an alternative media organization who specializes in the coverage of political and social issues in Guatemala. The linked article is strategically divided into two parts. The first part presents harrowing testimonies of sexual abuse against the minors living in the care home committed by teachers and personnel working in the center. The victims' testimonies are accompanied

¹⁵ <https://nomada.gt/politica/las-razones-del-amenoramiento-de-las-ninas-del-hogar-seguro/>

by details of investigations carried out by the prosecutor’s office in Guatemala that led to convictions for sexual assault against minors. The testimonies and criminal complaints described in the article go back to the year 2010, and since then, 28 charges have been filed against abuse and mistreatment of children and adolescents living in the center. The article attributes the evils in those centers to lack of budget and the little importance that the government gives to them. The second part of the article quotes the director of the Secretary of Social Welfare of the Presidency speaking at a press conference on the same day of the tragedy. In the figure below, the text to the right presents an English translation of the director’s statements included in the original article.

Pueden leer el artículo de las razones del amotinamiento de las niñas del Hogar Seguro aquí: buff.ly/2mpawU3

Translate Tweet



6:20 AM - 9 Mar 2017

104 Retweets 52 Likes

English translation of some statements in the linked article stated during the press conference offered by the Guatemalan government:

“The teenagers were sanctioned for extortion. The girls had sharp objects hidden in their hair. We exhausted the dialogue with the girls. We cannot accept a report that says that place is a pigsty where we torture the children. I consider the cause of the revolt, because they did not like the food, was not valid. There was no negligence. I will not present my resignation as Secretary of the Social Welfare Office. The problem is that judge mixes children who have committed crimes with children abandoned by their families. We ask the prosecutor’s office to investigate, but we do not directly hold anyone responsible. The President did not come to participate in the conference because he is attending urgent matters of the nation.”

“You can read the article of the reasons for the revolt of the girls at the care home here.” (Alternative media organization)

Figure 5.8. Example of an *informative* tweet referencing an article explaining the reasons of the revolt

Informative tweets illustrate diverse forms of content delivered through Twitter networks, in which interpretability was unambiguous, came from reliable authors, and included verifiable sources. However, these tweets left a big question unanswered: Why were the girls protesting? Elaborating on the possible reasons behind the riot is vital for making sense of the tragedy. Understanding the reasons that drove the girls to engage in actions that ultimately ended their lives is critical for determining how to respond to the tragedy. In this regard, Figure 5.7 depicts the most compelling story that answers that question. An additional factor of the story is the time it was published. The story appeared on Twitter on March 9, 2017, at 6:20 AM, less than 24 hours after the fire, setting the tone for further discussions on March 09. The public extensively commented on this story on Nomad’s website, and it was also published on Facebook and cited by other media outlets, both national and international.

A significant implication of informative frames in the framing of the tragedy is that it provides the evidence for supporting the plausibility of future stories. As noted by Weick et al. (2005, p. 415), “stories tend to be seen as plausible when they tap into an ongoing sense of current climate and are consistent with other data.” Informative tweets provided the empirical credibility for forthcoming frames because the stories they described served as empirical referents for further claims to be read as valid (Benford

and Snow 2000). These messages were produced mostly by newspapers and other reputable media organizations in Guatemala. Hence, the involvement of recognized media organizations in reporting facts accounted for the elaboration of “more plausible and resonant framings” (Benford and Snow 2000, p. 621).

Informative frames enabled an early state of awareness by providing information about the tragedy, in this case, a cue that something unfortunate has happened. As such, the discussions and commentary triggered by informative frames is the result of what Weick (1993) describes as sensing anomalies and efforts for labelling and categorizing the circumstances surrounding the tragedy. Stories told by informative frames highlighted the young age of the girls and the role of the government in operating the care home. During the days following the tragedy, *informative* messages included updates about the survivor girls under medical care and the prosecution of the managers that were responsible for operating the center.

Informative frames denote a phase that begins to make sense of the ongoing circumstances. At this stage, the framing of the tragedy consists of giving an interpretation to something that has already occurred but “does not yet have a name” (Magala 1997, p. 324). In other words, this form of framing involves endeavors by media organizations to provide an interpretation that turned the circumstances surrounding the fire into a situation that can be comprehended. Nonetheless, the stories do not yet articulate how this event relates to the everyday life of Guatemalans. As the process of framing unfolds, comments expressing feelings of dissent and indignation stemming from the informative stories started to frame the tragic incident as the outcome of serious wrongdoings committed at the care home.

5.4.4 Injustice Frames

Assertions of injustice are a mode of interpretation that fosters collective noncompliance, protest or rebellion (Gamson 1995). The figure below contains three tweets as examples of injustice tweets that identify the girls as victims in different ways.

The tweet to the left states that the victims of the tragedy were innocent. The author of the tweet seeks to accentuate her grievance by sharing a news article that describes the ill-treatment that the girls received at the center. The first hashtag *#GuateDeLuto* stands for “Guatemala is mourning” and elevates the scale of the tragedy as a national issue. The second hashtag *#NiUnaMenos* stands for “not one less” and signifies the intolerance to the death of women. I will discuss the role of hashtags as frame amplifiers shortly. These injustice tweets attempt to sensitize a general audience by disclosing the faces and names of some of the victims. By bringing their identities out of anonymity, these tweets aim to increase the awareness of the general population to the tragedy. The tweet to the right reveals that one of the girls was once part of a children’s brigade of firefighters. This tweet, thus, tries to give a reason to the civil society to care about the tragedy by portraying one of the victims not only as a young girl but also as an individual that was once in the service of society.

Mi solidaridad con los familiares de las víctimas inocentes de esta tragedia. 🖤 😔
 #GuateDeLuto #NiUnaMenos

The New York Times @nytimes
 "She told me that they treated her badly and gave them food with worms"
 nyti.ms/2m66eOJ

9:38 AM - 9 Mar 2017

56 Retweets 145 Likes

"My solidarity with the families of the innocent victims of this tragedy."

Alternative media organization



10:31 AM - 9 Mar 2017

46 Retweets 19 Likes

"They had a name and a story."

Alt. media organization



9:52 AM - 9 Mar 2017

58 Retweets 39 Likes

"One of the girls slaughtered in the home Virgin of the Asunción."

Alternative media organization

Figure 5.9. Example of *injustice* tweets

The recognition of the girls as victims by highlighting their innocence through injustice frames resonates deeply with the civil society because it renders the tragedy as a violation of the universal right of life. Hence, injustice tweets tell a story that is central to the beliefs and values of the Guatemalan society by highlighting that the girls who lived in the care home were children who deserved the right to life.

5.4.5 Accusatory Frames

Accusatory frames are persuasive frames stating explicit accusations about those responsible for the tragedy. Many of the messages interpreted as *accusatory* did not necessarily point out specific persons, but general entities like the government or the state. In contrast to the victimization dimension, frames making accusations tend to be less graphic, including only text and hashtags. For example:

(1) *"When 33 girls die in custody of public authorities, it is no longer an accident. It is a state crime. #FueElEstado."*

2:31 PM, 9 March 2017. 50 Retweets. Alternative media organization.

And,

(2) *"Failed state, you are a murderer #FueElEstado."*

4:51 PM, 9 March 2017. 63 Retweets. Alternative media organization.

The hashtag in the examples above stands for "it was the state," alluding to the state of Guatemala as the responsible for the death of the girls. The hashtag #FueElEstado was one of the most recurrent ones, and I will discuss it in a separate round of analysis. Other tweets targeted specifically the Guatemalan president. For example:

(3) *"It was not an accident, it was an execution. The only accident is this president. #FueElEstado."*

6:35 PM, 9 March 2017. 254 Retweets. Alternative media organization.

And,

(4) *"Do not deceive us: if in the face of a tragedy the president blames society and the past, it is that he did not fulfil his obligation #FueElEstado."*

6:20 PM, 9 March 2017. 39 Retweets. Alternative media organization.

The identification of public authorities as culpable agents through accusatory frames resonates with the civil society because it portrays a dysfunctional government institution. The ongoing and intricate process of improving the judiciary system in Guatemala has uncovered a large number of cases of high-level corruption in the Guatemalan government (HRW 2018). Alongside the investigations, several media organizations have kept the public well-informed about the wrongdoings of government officials. Thus, accusatory tweets tell a story that is congruent with current perceptions of Guatemalans about the functioning of public institutions.

Following the framing of the tragedy, persuasive frames reinforce the notion that framing that is driven by plausibility rather than accuracy. Although there was no investigation by the general prosecutor office that involved the president of Guatemala, the fact that a government agency operated the care home provided enough plausibility for many people to blame the government and the Guatemalan president. Furthermore, the accusatory tweet above refers to the President's statements reported by some informative frames. This tweet selects some aspects of the President's response to stress the responsibility of the Guatemalan government. Likewise, the tweet below frames the antecedents of abuse in the care home as an attempt to legitimize the riot and accuses the authorities of using the fire to silence the group of protesting girls.

(5) *"They were not quiet, they did not like that, they defended their rights and the state burned them. #NotOneMore #ItWasTheState"*

1:24 PM, 11 March 2017. 101 Retweets. Alternative media organization.

In a similar vein, injustice tweets exert their influence through the selective description of the victims of the tragedy. As injustice and accusatory frames illustrate, diagnostic frames determine how people understand and remember a problem by "selecting and calling attention to particular aspects of the reality described" (Entman 1993). Taken together, injustice frames attempting to amplify the victimization of the girls and *accusatory* frames identifying the culprits (or both in some cases), account for the construction of meaning—meaning that not only provides a plausible explanation but also renders the tragedy as relevant for any Guatemalan citizen that cares about violence against children or the actions of the government.

In contrast to the informative frames, persuasive frames are social constructions of reality that constitute a broader interpretive answer to “what is going on” or “should be going on” (Benford and Snow 2000). In the analysis, persuasive frames tell the story of a group of innocent girls that lost their lives due to the negligence of the government. Since the government was the responsible for the welfare of the girls, this tragedy represents a significant conflict with the norms and values of Guatemalan society. As a response, several actors engaged in framing the tragic incident as a problematic situation that needs to change.

The five accusatory tweets above illustrate the attributional component of diagnostic framing that focuses on blame or responsibility (Benford and Snow 2000; Gamson et al. 1982; Snow and Benford 1988). Identification of the source of causality, blame or culpable agents is essential for directing a course of action that seeks to remedy a problematic situation or issue (Benford and Snow 2000; Ferree and Miller 1985; Turner and Killian 1987).

5.4.6 Summary of Frame Types

The table below summarizes the frames types that resulted from the abstraction and generalization of the topics revealed by the topic modelling approach applied to the Twitter communications in the aftermath of the tragedy.

Table 5.12. Summary of Frame Types

Frame Type	General Frame Type	Description	Example and Author
Factual	Informing	Inform about the events surrounding the tragedy.	“So far 19 people are confirmed to have perished inside the Home Virgen de la Asunción.” Traditional media organization
Injustice	Persuasive	Stress victimization.	“We read the name of each girl victim, her age and we shout justice. #ForTheGirls #ItWasTheState.” Alternative media organization
Accusatory	Persuasive	Blame those perceived as responsible.	“#ItWasTheState. For the negligence of the President and the authorities of the Secretary of Social Welfare. #NationalMourning.” Alternative media organization

5.5 Frame Amplifiers

The close examination of persuasive tweets reveals the presence of elements that strengthened and intensified the messages carried by the frames. I think these intensifiers or *frame amplifiers* are interesting because they represent a mechanism by which frame articulators exploited Twitter’s

functional features to create content that resonated with Guatemalan culture. I identified two technological features in Twitter that enabled frame amplification: visual content in the form of images and hashtags.



“For the Victims of the Virgen de la Asunción home!”

Figure 5.10. Example of a tweet containing frame amplifiers

The figure above shows an injustice tweet containing a powerful image that I can further analyze through the use of semiotics (Myers 1997). The image comprises three main symbols: a woman, the Guatemalan flag, and a hashtag. The woman is a female characterization of Jesus Christ with the crown of thorns signifying the suffering and pain of the girls before dying. The depiction of Jesus Christ conveys a pragmatic meaning within the Guatemalan culture since most Guatemalans are Christians. The Guatemalan flag elevates the scope of the tragedy as a national grievance. The hashtag stands for “Guatemala is in mourning” and reinforces the meaning of the flag alongside the dark background of the image. The tweet was posted by a blogger on the day of the fire on March 08. Altogether, the image conveys the message that the girls were innocent, they were unjustly tortured and condemned to death by the authorities, but the authority, in this case, was the Guatemalan government (not Pilate). Hence the death of the girls was a Guatemalan tragedy.

The image in the figure above is an excellent example of narrative fidelity (Fisher 1984) which refers to the extent to which frames are culturally resonant. Benford and Snow (2000) assert that the higher the narrative fidelity of the proffered framings, the higher their salience and the higher the prospect of mobilization. Religion is an important part of Guatemalan culture. The presence of religious elements like the image of Jesus Christ and references to the practice of mourning were abundant on Twitter, playing an essential role in establishing a connection between the tragedy and the Guatemalan people.

Hashtags also played a significant role in amplifying the meaning of the proffered frames. I found two hashtags to be the most dominant across all content analyzed: #FueEIEstado and #GuateDeLuto.

The hashtag #FueElEstado stands for “it was the state,” and it is not unique to the Guatemalan tragedy. This hashtag was first widely-used during a mass kidnapping in Mexico in 2014 where 43 students went missing and presumably killed in unclear circumstances. Since then, this hashtag has become a symbol in Spanish-speaking countries to blame public authorities for the death of innocent people.

The other hashtag #GuateDeLuto stands for “Guatemala is mourning” using “Guate,” which is a shorter term used colloquially in the region for referring to the name of the country. Like the hashtag described in Figure 5.12, this hashtag references the religious practice of mourning in Guatemala. In contrast to #FueElEstado, this hashtag was first widely-used in the Guatemalan tragedy, and since then it has been used in different contexts.

The use of these two hashtags are essential elements of the frame amplification process described by Benford and Snow (2000) because they provide a mechanism for highlighting some beliefs and issues as being more salient than others. #GuateDeLuto raises feelings of grief at a broader national level, and #FueElEstado claims the state is the culprit of the tragedy. In this fashion, these hashtags function like shorthand, symbolizing principles and opinions of the frames of which they are a part (Benford and Snow 2000).

An intriguing aspect of these hashtags is their generality. Despite their general application, they were more popular than hashtags that were more specific to the tragedy such as #TodosSomosLas40 which stands for “we are all the 40” or #TragediaHogarSeguro which stands for “tragedy Hogar Seguro.” The analysis reveals a tendency for adopting simpler hashtags that are easy to write and mention while preserving the meaning of the enclosing frames, reinforcing Weick et al. (2005)’s notion that plausibility rather than accuracy drives sensegiving.

The tweets in the figure below, containing photographs taken during some of the protests, are examples of tweets that fulfil more than one purpose. The tweet to the left shows an array of candles put in front of the presidential house. This use of candles, which characterized the first protest on March 09, is traditional in many Latin American countries during vigil ceremonies before a funeral. The tweet at the center shows a sign with one of the most popular slogans during the crowd protests: “*Girls are not to be touched, raped, burned, nor killed.*” The tweet to the right shows different images of the massive crowd protest on March 11. The text in the tweet reads: “*This is how we meet again in the square to demand justice*” referencing the historical protests in 2015 for the resignation of the Guatemalan president at that time.

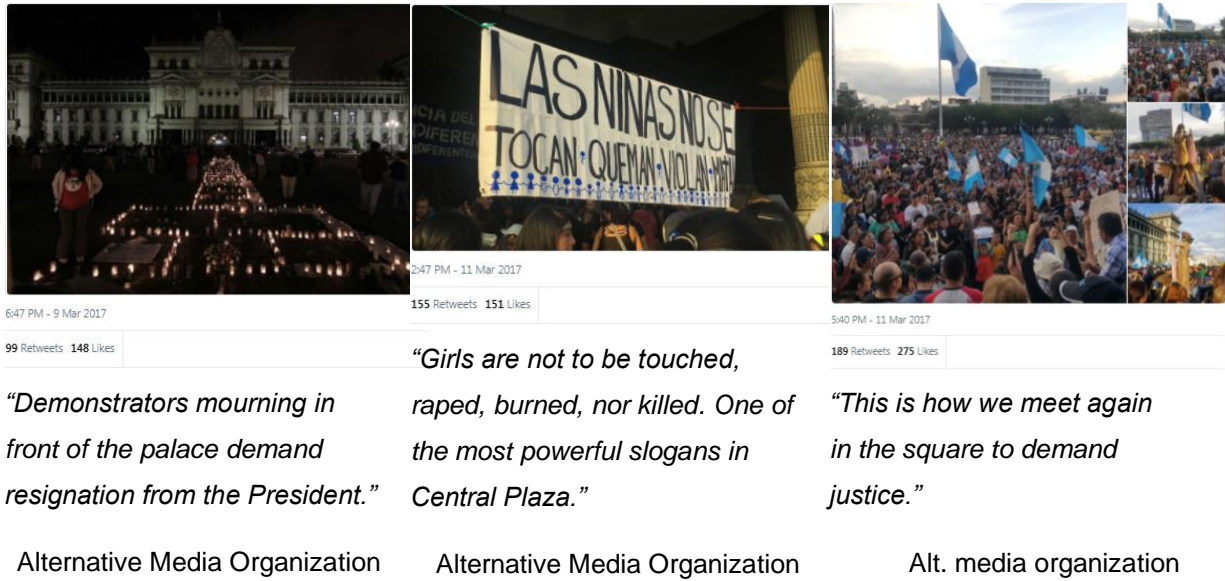


Figure 5.11. Examples of tweets containing photographs of different acts of protest

By using these photographs, the tweets act as *frame amplifiers* by using symbols used in the protests such as the candles and the Guatemala flag. These tweets also inspire the civil society to join the demonstrations. Hence, tweets can sometimes perform more than one function.

In the way that the protests became part of the events surrounding the tragedy, I observe once again the production of informative frames as outcome of the framing process of informing. The production of persuasive frames attaching meaning and interpreting the crowd protests go together with the production of informative frames in a cycle of sensegiving that repeats over time.

Chapter 6. Discussion

In the aftermath of a social tragedy, people in society search for meaning, settle for plausibility, and if necessary, engage in actions for bringing orderliness to their expected view of the world. The Guatemalan social tragedy involved several communicational efforts to disseminate meanings that constructed a shared understanding of the conditions surrounding the death of the girls. The Twitter communications that unfolded in the aftermath of the tragedy represent an example of a sensegiving process by which several social actors framed and directed meanings to the public. In this instance, traditional and alternative media organizations used Twitter to disseminate frames with the intent to inform and persuade the public in their understanding of the tragic incident.

The findings and analysis of the Twitter data describe how different media organizations aimed to influence the interpretation of the tragedy through the dissemination of the types of frames described in Tables 3.1 and 3.2. As the analysis has shown, the type of frames varied depending upon the social actor authoring the framing content. Tables 3.3 and 3.4 describe the different types of media organizations and their correspondence with the different types of frames. Immediately after the tragic death of the Guatemalan girls, informative frames created by traditional media organizations flooded the Twittersphere in the form of tweets informing the general population that something terrible has just happened. These informative frames were intertwined with persuasive frames created by alternative media organizations who attempted to make a deeper sense of the tragic incident.

Figure 6.1 below illustrates the different types of frames identified in the data as the outcome of a sensegiving process driven by traditional and alternative media. Based on the analysis of the Twitter data discussed earlier, the figure presents a taxonomy of the content created through Twitter by different types of media organizations that influenced the public in their interpretation of the Guatemalan tragedy. This taxonomy will now be explained.

6.1 Traditional Media and Informative Frames

As is shown on the left-hand side of Figure 6.1, traditional media tend to use informative frames with a focus on verifiable sources. Traditional media are media organizations that reflect and shape prevailing currents of thought in society (Lievrouw 2011). In the analysis, Free Press appeared as the most influential traditional media organization in the dataset. Free Press is a conventional news source that most Guatemalan people know about and regard as reliable. Informative frames authored by Free Press aimed at constructing an impartial understanding of the tragedy through factual descriptions of the background of the care home and events that unfolded in the aftermath of the tragedy. Traditional media organizations like Free Press used the Twitter technological feature of text-based posting for creating text in the informative frames. Also, Twitter technological features for creating visual content, such as photographs and videos, allowed Free Press to add verifiable sources in their content. As shown in Table 3.2, verifiable sources contributed to the source reliability of the informative frames and the reduction of fake news and rumoring.

6.2 Alternative Media and Persuasive Frames

As is shown on the right-hand side of Figure 6.1, alternative media tend to use persuasive frames with frame amplifiers. In contrast to traditional media, alternative media organizations often engage in the expression of a more diverse or alternative viewpoints (Lievrouw 2011). In the analysis, Nomad (critical journalism) and Justice Now (mediated mobilization) appeared as the most influential alternative media organizations in the data. Persuasive frames authored by Nomad and Justice Now intended to convince the public that the tragedy was the result of a dysfunctional government. Persuasive frames served its communicative goal by identifying the victims of tragedy through injustice frames and the culprits through accusatory frames. Injustice frames claimed that an injustice has been committed by focusing on the girls as victims of the tragedy. At the same time, accusatory frames accused the Guatemalan government as responsible for the tragedy.

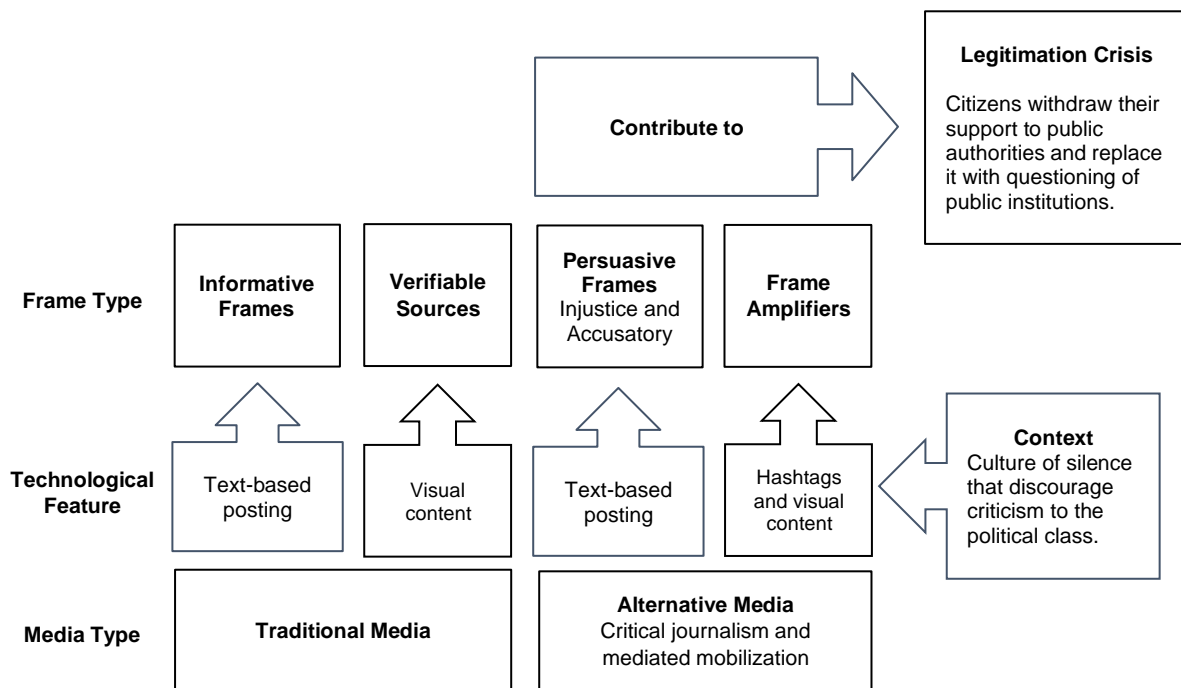


Figure 6.1. Taxonomic theory of sensegiving via framing of tragedies through social media

6.3 Technological Feature

Figure 6.1 shows the technological features of Twitter that the traditional media and alternative media used. Both the traditional media and alternative media organizations like Nomad and Justice Now used the Twitter technological feature of text-based posting. However, only alternative media tended to use Twitter's technological features for creating hashtags and visual content as frame amplifiers. Frame amplifiers strengthened and intensified the meanings disseminated through persuasive frames. For example, the hashtag "#ItWasTheState" acted as a frame amplifier. By explicitly referring to the state

as the culprit of the tragedy, this hashtag acted as a frame amplifier by throwing blame on public authorities. Also, in numerous instances, persuasive frames carried images containing religious elements that amplified the meaning in the frame by establishing a connection between the tragedy and religious beliefs of the Guatemalan people.

The amplification of meanings in persuasive frames identifying the victims and culprits helped the public to relate the tragedy to their everyday life experiences and beliefs. Alongside informative and persuasive frames, frame amplifiers exemplify the use of Twitter's technological features by alternative media organizations to create content that resonated with Guatemalan culture.

6.4 Legitimation Crisis

This in-depth qualitative study of a tragedy in Guatemala looked at how social media, and specifically Twitter, facilitated the sensegiving of the social tragedy. Extant theories of social movements recognize that when a critical mass of individuals sharing the same desire for change come together, the mobilization of individuals to support causes of social change is more likely to occur (Kendall 2012; Turner and Killian 1987). The analysis of social media communications sheds light on the processes of reality construction that depict the political effect of social media by funneling sentiments against the Guatemalan political class. Persuasive frames authored by alternative media influenced the understanding of the tragedy as an unprecedented injustice committed by public authorities. This unjust act, in turn, contributed to a legitimation crisis for the Guatemalan government. Legitimation crises have been part of human history long before the invention of social media technologies. Nonetheless, this thesis aligns with a growing body of literature asserting that social media play an important role in speeding up the incidence of legitimation crises, that in many cases, have led to the removal of heads of state in several countries worldwide (Oh et al. 2015; Shirky 2011; Tilly 2004).

Of course, not all legitimation crisis end up overthrowing a president. However, when the framing of a tragic event enable people to identify with a cause, these events leave their marks on society. The legitimation crisis in Guatemala that sought justice for the death of the girls gradually vanished in the following weeks. However, the perceptions of a failed public institution and a neglectful government have persisted and will likely have long-standing effects on the political and democratic processes in Guatemala.

6.5 Context of the Tragedy and The Political Role of Twitter

Twitter could play a political role because, in Guatemala, the concentration of media ownership in the television and radio industries by pro-government monopolies often prevent traditional media to exercise its role as a guardian of the "public sphere" (Shirky 2011). In this case, social media as a new form of media, permitted "new voices and new frames" (Miranda et al. 2016, p. 323). Furthermore, I argue the "culture of silence" that characterizes the context of this thesis was the main reason why alternative media organizations equaled the influence of traditional media. Guatemala, as an emerging democracy, went through a brutal civil war that demolished democratic principles in the country,

including the journalistic practice of scrutinizing the activities of business and political elites. In contrast to developed countries in the Western hemisphere, the television and radio media in Guatemala are highly dysfunctional by failing to promote public debate on issues of public interest that could challenge the authority and legitimacy of public institutions. This thesis responds to the call of to “what extent can social media relax structural constraints and content restrictions by permitting new voices and new frames.” I argue that social media can play a political role in emerging democracies like Guatemala by enabling new forms of media to disseminate meanings that serve the public role of the media of commenting and scrutinizing the actions of the governing class.

The analysis revealed the presence of several alternative media organizations that framed the tragedy as an injustice and accused the government as responsible. In the context of Guatemala, the existence and support to media organizations that are critical of the government is unprecedented. Guatemala went through 36 years of civil war from 1960 to 1996. That civil war destroyed every democratic principle that existed in the country. Now, Guatemala, as many other Latin American nations that share a similar past, is trying to restore a democratic regime. This thesis also helps to explain how Internet technologies are influencing that democratization process by facilitating independent and critical media.

6.6 A Taxonomic Model

This thesis proposes a taxonomy of the different frames and their authors derived from the Twitter communications that unfolded in the aftermath of the Guatemalan tragedy (Figure 6,1). This taxonomy contributes to the IS literature by describing the sensegiving of the tragedy through Twitter by different types of media organizations. These media organizations include different genres of alternative media that attempted to influence the interpretation of the social tragedy by disseminating content carrying meanings that challenged the legitimacy of public institutions in Guatemala. The use of Twitter by alternative media in Guatemala to influence the public in their interpretation of the tragedy is an empirical example of the political role of social media in the dissemination of views that were critical of the government.

This type of theoretical contribution represents an analytic or *descriptive theory* (Gregor 2006) that analyzes “what is” as opposed to explaining causality or attempting predictive generalizations. According to Gregor (2006), a descriptive theory is the most basic type of theory, valuable when little is known about some phenomena. Accordingly, the model below is a descriptive or taxonomic theory that describes and classifies characteristics of media organizations and social media content by summarizing the commonalities found in discrete observations. They state *what content* and *who created* that content.

This taxonomy or classification schema goes beyond basic description in “analyzing or summarizing salient attributes of phenomena and relationships among phenomena” (Gregor 2006, p. 623). The relationships specified in this theory are classificatory and compositional, not explicitly causal. The goal of this thesis in regards of achieving a theoretical contribution is to propose a taxonomy that breaks

down and typifies content created in social media for framing the social tragedy in the context of a culture of silence towards critical voices against the public authorities. I have developed this taxonomic model based on data from one tragic event. I hope that future studies will show whether this model has more general applicability.

Chapter 7. Conclusions

The aim of this thesis is to develop a better understanding of the political role of social media in emerging democracies. The social tragedy that took place in Guatemala is the specific empirical example used in this thesis to develop this better understanding. I am now able to return to the original research question viz. how can the sensegiving of a social tragedy through social media challenge the trust in public authorities?

To answer the question, I propose a taxonomic model in Figure 6.1 to explain the sensegiving of the social tragedy through Twitter. The main component of this model consists of the classification of tweets authored by diverse types of media organizations into informative and persuasive frames. The taxonomic model also identifies two types of media: traditional media and alternative media. Traditional media tended to adopt a neutral stance and engaged mostly in the production of informative frames. Informative frames created by traditional media consisted in the reporting of the tragedy based on factual statements without making judgments on those responsible or expressing sentiments of dissent.

On the other hand, alternative media engaged mostly in the authoring of persuasive frames. In contrast to traditional media, alternative media engaged in a more contentious posture by highlighting the identity of the victims and those responsible for the tragedy. The taxonomic model also describes two types of persuasive frames: injustice frames and accusatory frames. Injustice frames consisted of claims focusing on the victims of the tragedy whereas accusatory frames focused on the culprits. Injustice frames rendered the tragedy as an unjust act by highlighting the identity of the victims and their innocence.

Accusatory frames also authored mostly by alternative media denounced the government as responsible for the tragic incident. The fact that social media represents the main mechanism used by these alternative media to spread views that questioned the political class in Guatemala is an example of the political role of social media in an emerging democracy. The identification of accusatory frames and the alternative media groups authoring those frames helps to explain the potential of social media for enabling new forms of media to reach an audience and express critical views on activities associated to the governance of a country.

The theoretical framework presented in Chapter 3 builds on Weick et al. (2005)'s argument that "sensemaking is incomplete unless there is sensegiving" (p. 416). Sensegiving is a complement to sensemaking in which meanings are framed and disseminated to an audience (Fiss and Zajac 2006). Using the theories of sensemaking, sensegiving and framing as a lens, Tables 3.1 and 3.2 summarize the framing properties of centrality and experiential commensurability and their relationship with the sensemaking property of identity in persuasive frames. Injustice frames center on values and beliefs regarding the universal right of life. By stressing the identity and innocence of the girls that lost their lives, injustice frames amplify their victimization by portraying the tragic incident as an unjust and irretrievable act. The girls were not only residents of a state home that rebelled against their caregivers, but they were innocent children who deserved the right to live like any other child. In this fashion, the

centrality of injustice frames on the right of life drew the attention of people unrelated to the tragedy by connecting to their beliefs and values. In the way that injustice frames relate to the identity of the public by reflecting on their beliefs and values, these frames become a source of motivation for further action. In this case, actions consisting of calls to bring those responsible for the tragedy to justice.

Accusatory frames took a stance on the causes of the tragedy by laying the blame on government authorities. By identifying government authorities as guilty, accusatory frames fostered in the public a sense of failure in the government to fulfill their duties. The accusation of misbehavior in the government resonated with a Guatemalan society that has protested illegal and immoral acts committed by government officials in the past. Like injustice frames, accusatory frames relate to the identity of the civil society by echoing past events involving massive street protests and campaigns to tackle impunity in the Guatemalan political system. In the way that accusatory frames reflect on life experiences in citizenship related to their fight against impunity in Guatemala, these frames encourage calls for a change in the government.

Tables 3.1 and 3.2 also summarize the framing property empirical credibility and its relationship with the sensemaking property of plausibility in persuasive frames. Reports describing the care home as an institution managed by the Guatemalan government and the age of the victims served as empirical referents that reinforced the plausibility of the persuasive frames. More significantly, the story published through social media by alternative media unveiling testimonies of sexual abuse against the minors living in the care home contributed to the depiction of the care home as a dysfunctional government institution. This story became a strong empirical referent that also funneled the plausibility of claims emphasizing the innocence of the girls and accusing the Guatemalan government as responsible for the tragedy.

The taxonomic model shown in Figure 6.1 explains the dissemination of the frames as a process of sensegiving undertaken by traditional and alternative media. The dissemination of informative and persuasive frames on Twitter gave rise to a process of sensegiving through which diverse media groups attempted to influence the public in their sense or interpretation of the tragedy. Traditional media provided an understanding of the tragedy through the dissemination of informative frames that focused on salient aspects of the tragedy. For example, the fact that the victims of the fire were all minors and the care home was operated by the Guatemalan government. Informative frames exhibited the properties of interpretive unambiguity and source reliability preventing the spread of fake news and rumoring.

On the other hand, alternative media contributed to the interpretation of the tragedy as a problematic condition through the dissemination of persuasive frames that emphasized the innocence of the victims and accountability of the government. While traditional media engaged in delivering a factual description of the tragedy, alternative media engaged in providing the public with moral judgements by highlighting the identity of the victims and the culpability of the government. In this fashion, the taxonomic model explains a process of sensegiving delivered via the dissemination of different types of frames by different media organizations.

Studies on sensemaking and sensegiving generally focus on how people cope with uncertainty and how their interpretations of an unexpected event lead them to take different actions or to react in different ways (Fiss and Zajac 2006; Oh et al. 2015; Weick 1993; Weick et al. 2005). A study by Oh et al. (2015) explains how social media enabled processes of “collective sensemaking” through the creation of hashtags that functioned as symbols of the 2011 revolution in Egypt. According to Oh et al. (2015, p. 221), the broadcasting of hashtags through Twitter networks mediated “large-scale technosocial collective sensemaking with unprecedented speed and scale.” Oh et al. (2015) focused on a macro-level time series analysis of hashtags production, offering little explanation on how other forms of content contribute to the dissemination of meanings during periods of social unrest. The taxonomic model contributes to the IS literature by identifying the different types of frames disseminated through Twitter that attempted to influence the public in their interpretation of the Guatemalan social tragedy. The dissemination of injustice and accusatory frames contributed to a legitimation crisis for the Guatemalan government.

The novelty in the proposed taxonomic model is the characterization of the use of social media by alternative media to make accusations against the government in the context of a nation that has historically censored and prevented the media from criticizing the government. The problem of media censorship and the historical and social factors that have contributed to such a “culture of silence” in emerging democracies have been well studied in the literature (Fox and Waisbord 2002; Rockwell 2007; Rockwell and Janus 2001). However, the literature has not yet investigated the potential of ICT for restoring the role of the media as a state institution that works in service of the citizenry. By identifying the diverse genres of alternative media and their framing of the tragedy, this thesis also sheds light into the potential of social media for enabling new forms of media capable of breaking with media censorship.

From a methodological perspective, this thesis contributes to the IS literature by advancing the notion of “second-generation qualitative approaches” in IS research (Sarker et al. 2018, p. 755). This second-generation of qualitative approaches is an emerging trend in the IS field that aims to adopt a “pragmatic approach” to methodology by mixing and matching quantitative and qualitative approaches (Sarker et al. 2018, p. 755). This trend emphasizes the use of computational approaches, such as machine learning and text mining techniques, for studying digital trace data. Chapter 4 proposes a pragmatic approach to research methodology based on a mixed-methods approach that combines interpretive case study research with computational techniques derived from social analytics.

The methodological contribution of this thesis addresses concerns of using computational data-centric approaches in IS research (Agarwal and Dhar 2014; Berente et al. 2018; Rai 2016; Sarker et al. 2018). Computational approaches consist of algorithmic repeatable processes that enable researchers to incorporate large amounts of data and mine patterns that can be easily visualized (Sarker et al. 2018). The problem is that, in many cases, the outcomes of computational approaches do not convey an “understanding of the causal processes that are yielding the observed outcomes” (Agarwal and Dhar 2014, p. 446). In other words, those patterns and visualizations “are not theory” (Berente et al. 2018, p. 1). Researchers have signaled that computational data-centric approaches needs to be integrated with

interpretation-centric work (Sarker et al. 2018) to generate richer and more accurate understandings of the phenomena under study (Berente et al. 2018). Chapter 4 proposes the integration of several principles of the interpretive case study methodology (i.e., contextualization, abstraction and generalization) with principles of pragmatism (i.e., constitution and consequences) as a methodology for assessing the “meaningfulness” (Rai 2016, p. 8) of the patterns in the data revealed by computational tools (i.e., social network analysis and topic modelling).

Now, I discuss the implications of the findings of this thesis. On the positive side, this thesis can encourage individuals and groups concerned with freedom of the speech in emerging democracies to engage in the use social media, and ICT in general, for promoting public discourse. This call is relevant for universities and groups concerned with breaking a culture of media censorship. I think universities in emerging democracies like Guatemala can play an important role in society by leveraging ICT to advance initiatives that promote debate and the understanding of social issues.

Furthermore, the high levels of influence in social media exhibited in the content created by alternative media suggests the existence of a public receptive to content that challenges the status quo in politics and society. The alternative media organizations described in this study rely exclusive on ICT, particularly social media, for growing and reaching their audiences demonstrating the operation of new business models for conducting journalism. Instead of the traditional advertising-based business model, the alternative media projects identified in this thesis adopt alternative support models, including not-for-profit foundations and crowdfunding, to support their activities. For these media projects, social media and ICT are essential channels for maintaining a growing number of readers, which is critical for attracting donors. A significant and rising number of readers or followers is crucial for these organizations to be regarded valuable in society and deemed worthy of donations by groups interested in supporting independent media.

Another implication of this thesis relates to policies on social media regarding the recommendations of content made by social media sites like Twitter and Facebook. This thesis highlights the diversity of content created by alternative media organizations that offered different ways of interpreting the social tragedy. Affecting the exposure that social media users have by prioritizing those that can pay a fee or are willing to buy visibility in social media creates a big problem for media organizations relying on a small budget. This is especially important in cases where strong media monopolies have the power to crush any competition. In these cases, social media becomes more part of the problem than of the solution.

Along these lines, and on a more negative side, the findings in this thesis can also motivate those supporting undemocratic regimes to thwart public discourse. Efforts made by business and political elites to crush critical voices in social media against their interests have been documented (e.g., The Intercept (2018), Freedom House (2017)). In Guatemala, there has been cases of dedicated groups sponsored by the government that use social media “routinely and relentlessly to harass and intimidate opponents of Guatemala’s entrenched elite” (The Intercept 2018). The use of social media by the political class to squash critical views against them is not unique to Guatemala. “Armies of ‘opinion

shapers' are now used on social media by the governments of 30 countries to support their agendas and attack detractors" (The Intercept 2018). This scenario depicts a dark side of the use of ICT in which a nation's elite groups deploy ICT in ways that are only beneficial to their members but detrimental to society at large. To the detriment of society, social media and ICT can also be used to promote extreme views that lack the common ground necessary for collaboration within diverse groups and the building of a progressive society (Lee et al. 2014).

Now, I acknowledge the limitations of this thesis and directions for future research. First, I have studied the role of social media in the development of independent media in emerging democracies in a single country. The computational approaches used in this thesis for data collection and analysis can be extended to collect and analyze data from other nations. Although Guatemala is an excellent example of how ICT enables the emergence of alternative media organizations, the strengthening the media as an independent state institution is a phenomenon hardly exclusive to Guatemala. Currently, countries such as Honduras and Nicaragua are undergoing periods of violent social unrest where ICTs are increasingly used by alternative media organizations to stand up to authoritarian regimes.

Second, public concern derived from the Guatemalan social tragedy as evidenced by crowd protests lasted for a short time only. The data gathered and analyzed in the Guatemalan case study corresponds to a relatively short period of time. Future studies could look at processes of sensegiving over a more extended period. This line of research could also investigate how tragic events create opportunities for alternative media to fill the informational gap left by traditional media organizations. Such direction could shed light on the emergence of alternative media and how actors in alternative media gain influence in public opinion. Such direction could shed light on how ICT serves as a platform for citizens in emerging democracies to become more engaged in their societies to affect change in the status quo.

Furthermore, as I mentioned before, Twitter's technological features for creating hashtags and visual content enabled the amplification of framing content that were resonant with Guatemalan culture. As various users rely distinctly upon different social media features in a particular social context, technological features have the potential to intertwine with social processes and affect societal transformation (Zheng and Yu 2016). Zheng and Yu (2016) advanced the concept of "affordances for practice" to explain technological features of social media as embedded in and emergent from social processes within and beyond organizational boundaries. Affordances for practice emphasize the social, institutional, and historical environment use of social media. Following this line of research, future studies could build upon the taxonomy proposed in Figure 6.1 to study affordances of social media for practice.

Another direction would be to study how different levels of engagement relate to content types. For example, I observed a tendency in framing tweets identifying the culprits of the tragedy to have higher retweet counts than the rest of the tweets. A quantitative study could formulate hypotheses that could predict the popularity of a tweet based on the different classes or purposes of its content.

The social tragedy in this thesis relates to only one of the many social problems in emerging democracies like Guatemala. Emerging democracies also suffer from many of other social issues, such

as corruption, income inequality, and extreme poverty, just to mention a few. All these problems are complex, hence the framing of these issues in ways that can be discussed and understood by the public is vital for empowering the civil society to make better decisions when electing their leaders. Emerging democracies account for most of the world's population. A further reason to care about the progress of emerging democracies from a business and policy perspective is "that the world is becoming increasingly interconnected in economic, social, and cultural terms" (Walsham et al. 2007). There is no question on whether ICT is relevant to social development, "the question has now become how ICTs can benefit development" (Walsham et al. 2007, p. 317). By broadening our understanding of the political role of social in emerging democracies, this thesis also sheds light into the potential of social media for enabling new forms of media free of government control in emerging democracies.

Appendixes

Appendix 1: Studying Semantic and Pragmatic Relations¹⁶

Following the main topic of this thesis regarding the political role of social media in emerging democracies, I suggest that the emergence of different groups concerned with social justice in Guatemala create content in social media with different perspectives and motivations that play an essential role in enabling the citizenry to understand how dysfunctional state institutions affect their everyday life. Moreover, the various forms of social interaction afforded by social media (e.g., posting and sharing) enable a space for discussing and judging wrongdoings committed by public authorities. Hence the research question I seek to answer in this section is: How social media strengthens the public sphere in Guatemala by expanding shared awareness on situations that arise due to the malfunctioning of public institutions?

To answer this question, I engaged in a quantitative study based on linguistic properties in the Twitter communications that followed the Guatemalan tragedy in which 41 girls lost their lives. Understanding a discourse can be regarded as the construction of a mental *representation* of the discourse by the reader (Sanders et al. 1992). According to Sanders et al. (1992, pp. 1,2), an acceptable discourse *representation* “has a property that distinguishes it from the representation a reader might make of an arbitrary set of utterances: the *representation* of the segments in the discourse are linked coherently.” For example, the text below comes from a tweet created in the context of a tragic accident in which 41 girls lost their lives while living in a government-run center. We can infer a coherence relation of the form “argument-claim” (Sanders et al. 1992, p. 11) between the segments of this message as it allows us to experience it as a connected discourse.

(1) *“Do not deceive us: If the President blames the society and the past for the tragedy is because he did not fulfil his obligation.”*

The argument that the President does not take responsibility but instead attributes the tragedy to social issues and historical reasons is used as evidence by the author of the tweet to claim that the President did not fulfil his duties.

Furthermore, the way these coherence links are established “transcends the linguistic aspects of a discourse and that is of a cognitive nature” (Sanders et al. 1992, p. 2). This implies that lexical markers like *but*, *on the other hand*, and *because* are not mandatory for a coherence relation to exist (Sanders 1997). This aspect is important in social media communications since it enables the consideration of elements such as hashtags that are often not connected lexically to other text. For example, in the message below, a coherence relation of the form “condition-consequence” (Sanders et al. 1992, p. 11) exists between the hashtag and the remaining text.

¹⁶ Work included in Ortiz, J. 2018. “Facts or Opinions? Making Sense through Social Media,” *Proceedings of the Twenty-fourth Americas Conference on Information Systems (AMCIS)*.

(2) *“For the Victims of the Home Virgen de la Asunción! #GuatemalaIsInMourning.”*

In this example, the death of the girls at the care home creates the condition for the entire country to be in mourning.

Thus, a coherence relation is an aspect of the meaning of two or more discourse segments that cannot be described in terms of the meaning of the segments in isolation (Sanders et al. 1992). The theory of coherence relations introduced by Sanders et al. (1992) proposes a taxonomy for describing the whole set of coherence relations (e.g., argument-claim and condition-consequence) in terms of four basic notions or primitives. In this study, I am interested in the primitive of source of coherence, which can have two values: pragmatic and semantic.

According to Sanders et al. (1992), if the discourse segments are related because of their propositional content (i.e., they follow a logic that is independent of the context), then the source of coherence is semantic and reflects a semantic relation. In this case, the writer refers to the relatable meanings of the segments. For example, the text below contains messages extracted from a video embedded in a tweet aimed at explaining the antecedents of the tragedy.

(3) *“More than 600 girls and adolescents were under the tutelage of the State. The Secretariat of Social Welfare received children and adolescents from 0 to 18 years old, victims of violence.”*

The text above comprises two sentences related by their propositional content. The expression of meaning in this sentence is coherent because it is part of our knowledge that welfare organizations operated by the government exist to take care of children who have suffered hardships in life.

On the other hand, a relation is pragmatic if the discourse segments are related because of the writer's intention of one or both segments. In pragmatic relations, the coherence relation concerns the speech act status of the segments. In other words, the coherence exists because of the writer's goal-oriented communicative (speech) acts. For example, the tweet below illustrates a pragmatic relation between the sentences.

(4) *“When 33 girls die in custody of public authorities, it is no longer an accident. It is a state crime.”*

The text in this tweet exhibits a pragmatic relation because the state of affairs in the first sentence is not the cause of the state of affairs in the second sentence, but the justification for making that utterance. This tweet attempts to persuade the reader that the tragedy was not the result of an unexpected event, but the outcome of deviant actions perpetrated by the state. In the same way, the tweets presented in (1) and (2) are also examples of pragmatic relations.

I draw on the notion of source of coherence and text types to classify content created social media during processes of sensemaking. Text types or genres refer to the author's communicative goal which can be: informative, expressive and persuasive (Brewer 1980). A study by Sanders (1997) proposes a set of relationships between the source of coherence and the text type that distinguish the mechanisms by which authors achieve their communicative goals. According to Sanders (1997), the structure of informative content “in which the writer's goal is to inform the reader about something” is dominated by

semantic relations (Sanders 1997, p. 136). On the other hand, persuasive and expressive content is governed by pragmatic relations.

The reason for using discourse analysis for understanding content produced during processes of sensemaking is due to the cognitive nature underlying the notion of source of coherence. I argue that the question of understanding how people connect segments within a single message (pragmatically or semantically) offers an interesting insight into the mechanisms by which messages with different purposes (inform, comment or persuade) fulfil their goal.

In the next section, I draw on Sanders et al. (1992)'s notion of source of coherence as a method for classifying content in Twitter created during situations involving high levels of informational uncertainty and situational ambiguity – in our case, the decease of the 41 girls in a state-run care home.

A.1.1 Analysis

In this section, I am interested in examining the role of social media in strengthening the public sphere in Guatemala by expanding shared awareness on situations that arise due to the malfunctioning of public institutions. I focused on messages authored on Twitter related to a tragic incident in Guatemala where 41 girls died because of a fire in a children's care home operated by the government.

I analyzed the Twitter data in two iterations. In the first iteration, I classified the data following Brewer (1980)'s taxonomy of text types and Sanders et al. (1992)'s notion of source of coherence. In the first iteration, I performed a qualitative analysis to understand the meaning conveyed by the tweets under the expressive and persuasive types. In the second iteration, I focused the analysis on the informative type of tweets. In the next subsections, I present the research context, as well as the data collection, filtering, coding scheme, and analysis.

Coding Scheme

I coded each tweet according to the source of coherence governing the relation of its segments (semantic or pragmatic) and text type (informative, expressive and persuasive). For determining the source of coherence, I followed the paraphrase test proposed by Sanders (1997). The table below depicts a summary of the criteria that I used for coding the data.

Code	Description	Source
Semantic	Segments are related because of their propositional content.	Sanders et al. (1992).
Pragmatic	Segments are related because of the writer's goal-oriented communicative acts.	Sanders et al. (1992).
Informative	The writer's goal is to inform.	Brewer (1980).

Expressive	The writer's goal is to express his or her feelings and attitudes.	Brewer (1980).
Persuasive	The writer's goal is to persuade the reader of something.	Brewer (1980).

Table A.1.1. Coding Scheme

Analysis

In the first iteration, I classified the tweets following Brewer (1980)'s taxonomy of text types and Sanders et al. (1992)'s notion of source of coherence. The table below shows the contingency table for the distribution of the four levels in the two categorical variables that resulted from the coding task. The figure below displays a visualization of the distributions in the table below. The findings agree with Sanders (1997) in which semantic relations dominate informative texts whereas pragmatic relations dominate expressive and persuasive texts.

	Expressive	Persuasive	Informative
Semantic	0	0	47
Pragmatic	68	18	36

Table A.1.2. Distribution of Source of Coherence and Text Type

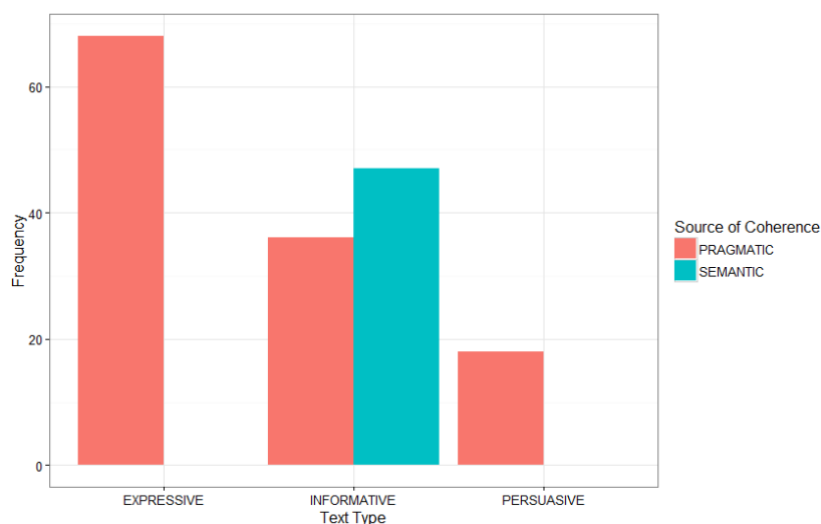


Figure A.1.1. Clustered Bar Chart for Distributions in Table A.1.2

In the first iteration, I performed a qualitative analysis of the tweets under the expressive and persuasive categories to interpret the meaning conveyed by these types of tweets (Klein and Myers 1999). The analysis revealed that tweets under the expressive category, aimed at either commenting on the victims or the perpetrators of the tragedy. Specifically, expressive tweets focusing on the girls as victims seek to claim an injustice by amplifying their victimization. For example:

(5) *"We are missing 33 girls, do not forget them. #ItWasTheState. #NotOneLess."*

The author's goal of the tweet in Example 5 is expressive in identifying the girls as victims of an injustice. The tweet tries to influence the audience at remembering that the girls have died. In doing so, the segments in the tweet cast a performative function (speech act) because is asking us to do something and therefore it exhibits a pragmatic relation. On the other hand, expressive tweets focusing on the perpetrators of the tragedy refer to explicit accusations about those responsible. For example:

(6) *"We do not want morals we want justice. Who killed the girls? #ItWasTheState."*

The tweet in Example 8 expresses the idea that the President has some accountability for the death of the girls. The first segment identifies the Guatemalan President by referring to a television show called "Morals" in which the President starred before his candidacy. The question in the second segment tries to imply the girls were in fact murdered. In a similar vein to Example 5, the coherence relation between the two segments is pragmatic because of the author's goal-oriented communicative act—it is trying to convince us that the President is responsible for the tragedy.

Furthermore, persuasive tweets represent explicit calls for demonstrations at different locations in Guatemala City. For example, the tweet in figure below reads: "We feel together. Grieve, anger, and pain. 6 PM presidential house. Let's share silence and mourning. Come with family." This tweet is a persuasive tweet because its purpose is to motivate the public to attend a public gathering as a way of protesting the injustice committed against the girls.



Figure A.1.2. Example of a Persuasive Tweet

In the second iteration, I focused on the tweets under the informative category. Unlike the expressive and persuasive types, informative tweets are dominated by both semantic and pragmatic relations which make tweets under this type the most interesting in the dataset. A close reading of informative tweets shows that they comprise descriptions of the causes and events related to the tragedy. In contrast to expressive tweets, informative tweets resemble news reports on the tragic incident without explicitly pointing out a culprit or expressing sentiments of dissent against the authorities. An important characteristic of informative tweets is that they were authored mostly by media organizations. Additionally, informative tweets included links to external web pages, videos or images as evidence

supporting the reports they communicate. For example, the two sentences below illustrate two tweets coded as semantic and informative.

(7) “@HRooseveltGT informs that it does not request supplies to serve patients of the Seguro Hogar Virgen de la Asunción. We have enough supplies.”

(8) “With the hashtag #FueElEstado, [social media users] call for a demonstration next Saturday to demand justice in the case of the death of 32 girls.”

In both cases, the segments of the tweet form a semantic relation because they provide the logic to construct a meaning that is independent of the context of the tragedy. Both tweets are informative because of the authors’ goal was to provide an update on the events surrounding the tragedy. Conversely, the tweets below illustrate examples of pragmatic-informative tweets.



Figure A.1.3. Example of a Pragmatic-Informative Tweet

The tweet in the figure above reads: “Today, Guatemala demands justice for the 33 girls who died due to the negligence of a State that turned its back on them. #ItWasTheState.” In this message, the writer’s goal is to inform its audience that people have come together to protest and claim justice for the girls. However, the second segment attempts to provide a reason for the death of the girls by highlighting the neglect of the Guatemalan state – a reason derived from the fact that the girls were in charge of a government dependency. Thus, the presence of a segment that draws on context rather than on the state of affairs of the other segment forms a pragmatic relation between the two segments.



Figure A.1.4. Example of a Pragmatic-Informative Tweet

Similarly, the tweet in the figure above reads: *“Water from the fountain in the central square is red for the girls who died in the Care Home. #ItWasTheState.”* This tweet illustrates a segment that seeks to highlight the suffering of victims of the tragedy by associating the red color of the fountain (caused by a colorant) to the deceased girls.

The tweets in the figure above and Example 5 were authored by a media organization that engaged in the production of several articles published through Twitter, Facebook and their website. These articles unveiled antecedents of child abuse in the care home and the neglect of the authorities of the center on addressing those issues (Nomada 2018). The tweets authored by this organization were amongst the most influential in the dataset (according to the number of retweets they obtained). I observed that many of these tweets were classified under the informative-pragmatic and expressive categories. The themes behind most of these tweets claimed the government was the main culprit of the tragedy— claims in full resonance with the conclusions of their journalistic work.

I discuss the implications of these findings in the next section.

A.1.2 Conclusion

This study aligns with the “environmental” view of social media suggested by Shirky (2011). Accordingly, social media is not a mere instrument for accessing information but an ecosystem for strengthening the public sphere through the freedom of personal and social communication among a state’s population. In this study, I regarded content created on Twitter after the Guatemalan tragedy as part of a process of sensemaking undertaken by the civil society (Oh et al. 2015). In the aftermath, many people turned to social media channels to find out what happened, express their opinions, and indignation in attempts to make sense of the situation. During this period, content in social media was created with different purposes, such as informing and commenting, in efforts to turn the circumstances into a situation that is comprehended explicitly in words by the public.

The movement that emerged in the days following the tragedy depict the case of how social media enables processes of collective sensemaking where tragic incidents are interpreted as unjust and punishable acts. The meanings and reality constructed from such process illustrate the interpretation of a tragic event caused by the malfunctioning of a state-run care home into a nationwide tragedy that concerned everyone in Guatemala.

In linking back to the theoretical foundations, the findings point to a process of sensemaking driven by pragmatic content in social media. In contrast to semantic content, the argumentative nature inherent to pragmatic relations gives rise to stories that rely more on plausibility than accuracy to convey meaning. This observation echoes Weick et al. (2005)’s theory of sensemaking which predicts sensemaking is driven by plausibility rather than accuracy. According to Weick, when the story is a sufficiently plausible account of “what is happening out there?”, it can serve as a landscape within which others might be able to make commitments and to act in ways that serve to establish new patterns of behavior. Under this light, the large number of “pragmatic” tweets framing the tragedy as a crime

perpetrated by the government contributed to the development of a story plausible enough to mobilize thousands of individuals to the streets to claim justice.

Regarding the research question on the role of social media on strengthening the public sphere in Guatemala by expanding shared awareness on situations that arise due to the malfunctioning of public institutions – the presence of informative messages governed by pragmatic relations reflect the production of stories with a higher interpretive value than solely descriptive reports of the tragedy. In this way, coverage in social media by different media groups expanded shared awareness on the failure of the home to fulfil its responsibilities by highlighting the causes and culprits of the tragedy.

Appendix 2: Structural Properties of Social Networking Sites

In recent decades, information and communication technology (ICT) has been recognized as an enabler of social transformation and national progress (Majchrzak et al. 2012). Social movements have relied on ICT to increase user (volunteer) participation across the world (Majchrzak et al. 2012) as part of their repertoire of tactics to bring about social change (Staggenborg 2011). The increasing popularity of ICT and its efficiency for diffusing information creates an advantageous choice for social movements for spreading their messaging (Lerman and Ghosh 2010) and extend their base of supporters (Selander and Jarvenpaa 2016).

For instance, in the battle against international financial institutions driven by the global justice movement, the Internet has functioned as a bridge for civil society organizations to “network transnationally” (Ayres 2005, p. 17). As a result, the Internet has enabled multiple non-governmental organizations (NGOs) around the world to share information and “expand the movement geographically” (Tarrow 2005, p. 32). The reliance on electronic forms of communication has also helped transnational social movement networks to become more closely connected with the “everyday routines of greater numbers of people” (Smith 2008, p. 126). Forms of online activism that range from online petitions (Selander and Jarvenpaa 2013) to more extreme campaigns such as netstrikes (Della Porta and Mosca 2005) have also used the Internet as means to support policy change efforts.

Furthermore, social media technologies have also played a pivotal role in recent social uprisings. Several studies explain the role of social media in the wave of revolutions that unfolded during the Arab Spring in 2011 (Ghonim 2012; Howard et al. 2011; Lotan et al. 2011; Oh et al. 2015; Oh et al. 2012). Ghonim (2012) in his book *Revolution 2.0*, attributes the overthrow of the Egypt President in 2011 to a multitude of individuals who collaborated online towards a “unified revolutionary goal” (Oh et al. 2012, p. 2). In line with Ghonim’s claims, Oh et al. (2012) explains how Twitter functioned as an engine for translating collective discomfort into collective action that led to the demise of President Mubarak in 2011. In addition to the democratic uprisings of the Arab Spring, the role of social media has also been studied during the 2009 Moldovan parliamentary elections protests (Mungiu-Pippidi and Munteanu 2009), the 2009 Iranian Green Movement (Burns and Eltham 2009; Khonsari et al. 2010) and online political activism against Australian security policies in 2013 (Chatfield et al. 2015) and against abuses to human rights (Selander and Jarvenpaa 2016).

The literature recognizes the potential of social media as an alternative channel for promoting the causes of social movements, but little is known about the factors that act on the endeavors by social movement organizations to expand their base of followers in social media environments. This study examines how the presence of influential and popular actors in social networks, relates to the acquisition process and the number of new followers gained by a social movement organization. I collected Twitter data from a major social movement organization in the global justice movement and found evidence suggesting a relationship exists between the presence of popular figures and the audience acquired by the social movement organization.

A.2.1 Resource Mobilization Theory: Building the Theoretical Framework

Resource Mobilization Theory (RMT) is one of the most popular theories for understanding the importance of resource acquisition in the attempts of social movements for “succeeding social change” (Klandermans and Staggenborg 2002, p. ix). Traditional collective perspectives of 1950s paid particular attention to the psychological state of the participants, regarding social movements as spontaneous bursts of action amid common grievances and perceptions of fraudulent systems of governance (Hannigan 1985). Conversely, RMT asserts the rise and success of social movements depend on the acquisition of resources by actors who engage with the causes of the movement through formal organization (McCarthy and Zald 1977; Tilly 1978).

RMT argues that social movements rely on strategies and structures shaped by cycles of mobilization to diffuse sentiments of dissent and raise public awareness (Jenkins 1983). “Cycles of mobilization” are processes whereby groups that share grievances gain access to resources (Tilly 1978, p. 54), increasing the “readiness of movements to act collectively” (Edwards and McCarthy 2004, p. 116). RMT emphasizes that resources available for social movements are not only material like financial capital or physical equipment, but they also include “immaterial assets” such as the commitment, time or the social networks around the participants (Edwards and McCarthy 2004, p. 125). Accordingly, RMT introduces the concept of “social-organizational resources” (Edwards and McCarthy 2004, p. 127) built on top of theories of social capital developed by James Coleman and Pierre Bourdieu in the 1980s. Social-organization resources can take the form of formal organizations created for purposes of the movement goals such as social movement organizations (McCarthy and Zald 1977), or informal networks maintained around the actors of the movement such as “their social circles or friendship networks” (Edwards and McCarthy 2004, p. 127).

Resource mobilization theorists further discern the concept of mobilizing structures as special social movement organizations or vehicles which movements use to recruit participants and organize action campaigns (McAdam et al. 1996). Mobilizing structures, in turn, interact with social-organizational resources to access larger networks of individuals with the objective to promote the motives of the movement. Concisely, RMT argues that movements arise out of the outcome of mobilization processes and highlights the importance of social movement organizations (SMOs) for the acquisition of resources (Jenkins 1983). Furthermore, the presence of different forms of social-organizational resources increase the overall likelihood of mobilization processes for succeeding collective action (Edwards and McCarthy 2004; Staggenborg 2011).

Triadic Closure: A Principle for Network Formation

According to RMT, social-organizational resources ease opportunities for social movements to increase awareness of their messaging and recruit a larger number of participants during cycles of mobilization. From a social network perspective, the social structures embedded in social-organizational resources enable social movements to connect with the grievances felt by larger networks of individuals, facilitating the formation of linkages to new followers. This conception is reinforced by the principle of

triadic closure from social network theory. This principle posits that if two actors in a social network have a common friend, then there is an increased likelihood that they become friends themselves at some point in the future (Rapoport 1953). The principle of triadic closure highlights opportunities for the “creation of new social relationships that result from existent linkages to a common friend” that acts as a mediator (Easley and Kleinberg 2010, p. 48). Figure A.2.1 illustrates the principle of triadic closure: If we take two snapshots of a network at different points in time t and t' ($t' > t$), we will see the formation of new linkages in time t' that result from two actors who are connected to a common actor in time t . In this case, we observe new linkages formed between a_8 and f that resulted from both actors having a_6 as a common neighbor in the network. The same condition applies to the linkage formed between a_2 and f through a_4 and a_5 .

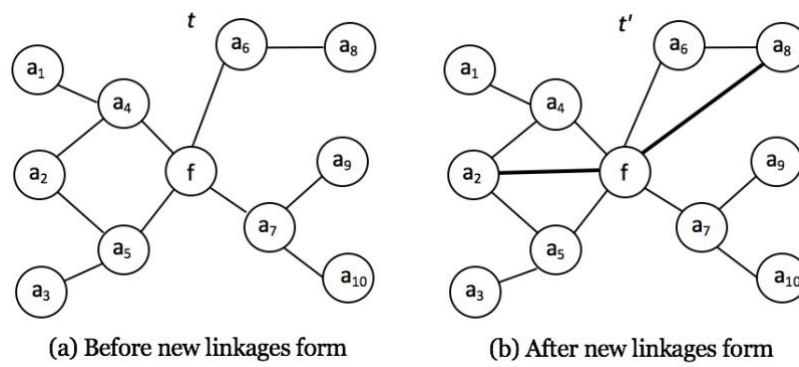


Figure A.2.1. Formation of linkages under the principle of triadic closure

In the context of resource mobilization, I contend actors of social-organizational resources play the role of mediators in the creation of linkages between new followers and social movement organizations (SMOs). As the SMO gains new followers during cycles of mobilization, the principle of triadic closure provides the basis for understanding the role of social-organizational resources in the acquisition of new participants. As illustrated in Figure A.2.1, we can regard the node f as a mobilizing structure positioned at the center of a social network. Respectively, this organization connects to other actors who, in turn, act as mediators that create opportunities to the organization for developing linkages with a greater number of individuals.

Easley and Kleinberg (2010) explains some fundamental reasons behind the formation of linkages under the principle of triadic closure that we can apply to the context of resource mobilization. During the process of linkage formation to the organization represented by f , the fact that there is a former connection between a_8 and a_6 and that a_6 also connects to f gives a_8 the basis for trusting f other than joining an arbitrary organization. From a simpler perspective, the existent relationship from a_6 to f and from a_8 to a_6 prompts an increased chance for a_8 to know about f .

The prevalence of the principle of triadic closure in social networks motivates the formulation of network measures that attempt to explain the role of “pre-existent structures in the formation of new linkages” (Easley and Kleinberg 2010, p. 49). During cycles of mobilization, as members of social-organizational resources acting as mediators facilitate the creation of linkages to new followers, we should detect the incidence of triangles or triplets formed between SMOs, the new followers, and the mediators. In this way, by examining the frequency of these triplets over a cycle of mobilization, we can analyze the relevance of social-organizational resources in their role of facilitators for the acquisition of new followers by social movement groups.

In addition to the principle of triadic closure, social network theory also encompasses the study of heavy-tailed or power-law distributions to explain the emergence of influential actors in social networks (Barabási and Albert 1999; Jackson and Rogers 2007). Under this view, social networks are the result of processes of preferential attachment where new members in a population connect preferentially to already well-connected members (Jackson and Rogers 2007). The first study that developed the concept of heavy tails to identify influential actors in social networks comes from Price (1976) on his work on citation networks. Based on Price (1976)’s work, Barabási and Albert (1999) were the first to study the existence of highly connected figures in online services as the outcome of processes of preferential attachment examined through the detection of power-law distributions. Since then, processes of preferential attachment have been traditionally adopted by Social Network Theory to explain the emergence of actors with a relative high number of connections with the potential to “influence a significant number of members in a social network” (Easley and Kleinberg 2010, p. 479).

The principles of triadic closure and power-law structures provide the rational basis for quantifying the impact of social-organizational resources in enabling opportunities for social movements to grow a greater audience. If the principle of triadic closure is a prevalent phenomenon in the creation of new linkages in social networks, then the presence of influential actors should exert an effect in the number of new followers acquired by the social movement when they play the role of members of social-organizational resources.

Resource Mobilization in Online Social Networks

Social media allows the creation of online social networks that have profoundly transformed the way we interact with each other and cultivate new social relations (Ellison et al. 2007). Online social networks (OSNs) are Internet-based services that allow individuals to construct a profile and articulate a list of users whom they share an interest (Boyd and Ellison 2007). As for 2016, analysis on the Internet traffic has ranked Twitter among the most popular online social networks alongside Facebook, LinkedIn, and Sina Weibo (Alexa 2016).

Twitter is, in essence, a microblogging service with the features of an online social network (Myers et al. 2014). Unlike other popular online social networks, the relationships among users do not need to be reciprocal (Kwak et al. 2010). In other words, a user can “follow” the updates or messages (tweets) of another user, without the approval of the user being followed. This non-reciprocal mechanism of relationships formation allows information to flow faster compared to other online social networks

(Lerman and Ghosh 2010). The popularity of Twitter and its efficiency for diffusing information creates an advantageous choice for mobilizing structures to use Twitter as a tool for raising awareness and mobilizing new participants (Lerman and Ghosh 2010). Furthermore, the goal of many contemporaneous social movements for “developing a global audience” (Tarrow 2005, p. 32), posits Twitter as an effective platform for attracting a large number of participants worldwide.

Few studies have applied RMT for studying the affordances provided by online social networks to support the mobilization efforts undertaken by social movements. Leong et al. (2015) studied how grassroots movements relied on online social networks as a resource to mobilize members of communities in Malaysia by raising environmental awareness and protesting against an industry feared to have caused environment degradation. Selander and Jarvenpaa (2016) describes how a social movement organization fighting against human rights abuses uses online social networks for mobilizing large numbers of supporters by creating new forms of interaction that deepen the involvement of its followers. As pointed out by Selander and Jarvenpaa (2016) and Leong et al. (2015), I assert online social networks play an essential role as social-organizational resources in expanding the base of participants of social movements. In this study, I am interested in establishing a significant relationship between influential actors and the acquisition of new followers by a social movement organization that could acknowledge influential actors as members of social-organizational resources that promote the acquisition of a greater audience.

Identifying Influential Actors in Twitter Networks

The identification of influential actors in online environments has been an important area of research since the advent of social media technologies (Nandi and Das 2013). Approaches based on structural measures have largely dominated the identification of influential actors in online social networks (Guille et al. 2013; Nandi and Das 2013). In Twitter networks, different studies point to different emphases, and their usefulness depends on the nature of the domain being studied. For instance, in the context of information diffusion, Brown and Feng (2011) proposes a method based on the k-cores decomposition algorithm to identify a set of users located within the core of the network as the most efficient spreaders of information. Cataldi et al. (2010) applied the well-known PageRank algorithm (Page et al. 1999) to assess the authority of users in their approach to detect emergent topics in the Twitter network. Likewise, several studies have also identified the existence of highly influential actors through the examination of power-law distributions (Kwak et al. 2010; Myers et al. 2014; Oh et al. 2012). Myers et al. (2014) further asserts these accounts do not belong to ordinary people but rather to celebrities or entities representing organizations. In the context of online mobilization, Oh et al. (2012) proposes a model based on power-law distributions to assert the existence of a large base of supporters following a pool of few opinion leaders during the Egypt Revolution in 2011. Based on previous studies on influential actors in Twitter networks, I draw on the concept of power-law distributions explained in the previous subsection, to assess the role of influential actors on connecting social movement organizations with a broader audience. The reason for choosing this method is that the high connectivity of influential actors described by power-law distributions lays an interesting setting for formulating

hypotheses that regard influence as a potential for mediating new linkages to larger populations in the network.

In this study, I hypothesize that if an online social network exhibits the presence of influential actors or network users with a high number of connections, then these users when following a SMO, should yield better chances for the SMO to acquire new followers.

A.2.2 Research Method

Background of the Global Justice Movement

The global justice movement is deemed as a “movement of movements” to protest neoliberal economic policies promoted by global financial institutions (Staggenborg 2011, p. 149). According to Staggenborg (2011), the targets of the global justice movement are international financial institutions and their policies as activists regard them as the cause for income inequality, environmental destruction and lowering labor standards. Under the frame of RMT, the World Social Forum (WSF) has become the most critical mobilizing structure for the global justice movement in recruiting participants and “providing educational space for people to learn about global issues” (Smith 2008, p. 224). The WSF has also facilitated transnational coalitions that have attracted a large number of participants and “expanded the “movement geographically (Tarrow 2005, p. 32). According to the WSF, their goal is to attract “tens of thousands of people from groups in the civil society, organizations and social movements who want to build a sustainable and inclusive world” (WSF 2016).

Data Collection: Building an Ego Network

Ego-centered networks or ego networks consist of a focal node, known as the ego, and the nodes to whom ego is connected. According to Wasserman and Faust (1994, p. 42), ego networks “have been used to study the effects of the social environment surrounding a single actor.” Based on the notion of ego networks, I am interested in examining how the sociotechnical environment comprised by the followers of the WSF in Twitter influences the formation of linkages to the WSF.

I have developed a Web crawler using the Python programming language to build an ego network with the WSF as its focal actor based on data collected from the Twitter API. I implemented the breadth-first search algorithm (Easley and Kleinberg 2010) with two levels using the WSF’s account as the starting node. I rely on the distinction of direct relations from one actor to another to represent the ego network as a directed graph (Scott 2012). Under these guidelines, I built directed graph representations of the WSF ego-network corresponding to 54 days from July 08, 2016 to August 31, 2016, as part of a mobilization cycle orchestrated by the WSF for their campaign at Montreal, Canada on August 2016 (WSF 2016). I performed measurements daily and for each measurement day, I crawled the entire ego network running my implementation of the breadth-first search algorithm. I stored the ego network for each measurement day in a document-oriented (NoSQL) database and used the R programming language for further analysis. In the first measurement, I crawled the accounts of 976 followers of the

WSF, and for the last day, I crawled 2,085 followers. At the end of the measurement period, I collected a total of 97,281,234 linkages for the analysis.

Analysis I

Since my implementation of the breadth-first-search algorithm includes two levels, I could detect at a given time, the followers of the WSF (level 1) and the followers of each follower of the WSF (level 2). In this way, for any two consecutive measurements at times t and t' , I was able to identify new followers gained by the WSF at time t' . By looking at the second level of the ego networks, I was able also to determine whether these new followers were followers of a follower of the WSF at time t . Consequently, I identified actors gained by the WSF that existed in the ego network before they become followers of the WSF.

Figure A.2.2 shows a time series for the followers acquired by the WSF across the measurement period. The solid line represents new followers that existed in the ego network before they become followers of the WSF (existent group with mean = 20.88). The dashed line denotes new followers that did not exist in the ego network, and therefore, no relationship was detected between these new followers (non-existent group with mean = 3.35) and any follower of the WSF. Figure A.2.2 also shows a spike in the number of followers gained by the WSF during the first two weeks of August that coincides with the gathering of the WSF from the 9th to 14th of August 2016. The difference between the two groups ($p < 0.01$) with a greater mean for the existent group motivated the examination of factors on existent followers that could predict increments in the number of followers gained by the WSF.

Using the data from the directed graph representations of the WSF ego-networks, I first generated the in-degree distribution of the actors following the WSF using the *powerLaw* statistical package for R (Gillespie 2015). The in-degree of an actor refers to the number of followers she or he has. The x-axis in Figure A.2.3 represents the in-degree of the actors following the WSF, and the y-axis represents the cumulative distribution function (CDF). The tail of the distribution in Figure A.2.3 shows the existence of users with a high number of followers suggesting a power-law distribution. To verify this presumption, I fit the in-degree distribution to a power-law distribution as illustrated in the straight line in Figure A.2.3. To test the fit, I performed a hypothesis test ($p = 0.54$) following the bootstrap procedure in which the null hypothesis asserts that the data in Figure A.2.3 is generated from a power-law distribution (Clauset et al. 2009; Gillespie 2015). The vertical line at 1,222 represents the value estimated for the parameter x_{\min} that denotes the value after which the distribution exhibits the properties of a power law structure i.e. the beginning of the tail (Clauset et al. 2009).

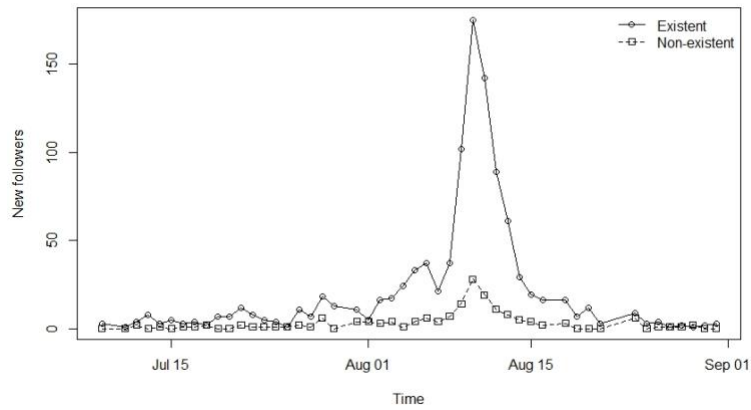


Figure A.2.2. Time series for followers acquired by the WSF

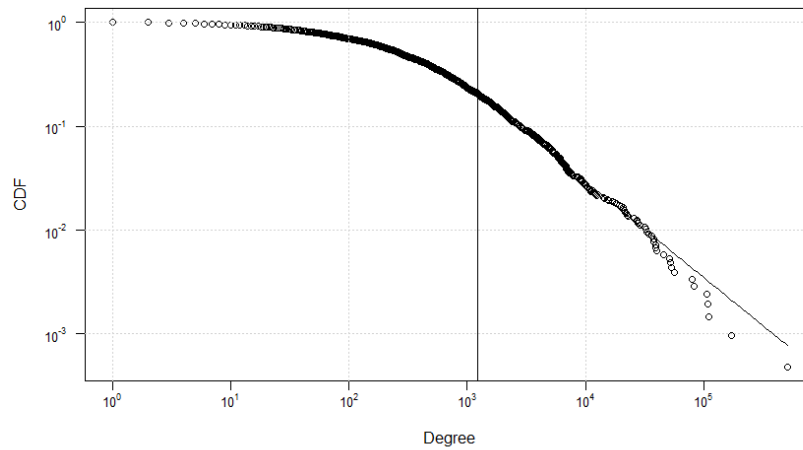


Figure A.2.3. In-degree distribution and power law fit

I am interested in determining if the popularity reported by users with high in-degree following the WSF depicted in Figure A.2.3 has any prediction capabilities on the number of followers gained across time by the WSF. Using data from the ego-networks at two consecutive measurements times t and t' , I identified followers of the WSF that had a direct linkage with new followers of the WSF at time t' . From a network point of view, each of these identified followers creates a three-vertex structure or triplet between the WSF, the new follower at time t' and the existent follower at time t . Thus, drawing on the concept of triadic closure explained in the previous section, I propose the hypothesis that followers of

the WSF with higher in-degree form a greater number of triplets as the WSF gains new followers. I propose to test the hypothesis with the following simple regression model:

$$Num_Triplets_i = \beta_0 + \beta_1 \log(\ln_degree_i) + \varepsilon \quad (1)$$

The dependent variable is the total number of times in which a follower i of the WSF formed a triplet during the full length of the measurement period. The independent variable is the in-degree associated with each follower.

Table A.2.1. Results of the regression model in Equation 1.				
Variable	Estimate	Std. Error	t value	Pr(> t)
Intercept	-40.8002	4.2543	-9.59	< 2e-16 ***
Log(ln_degree)	8.4312	0.6111	13.80	< 2e-16 ***

The results of the final model presented in Table A.2.1 indicates a significant logarithmic relationship exists between the in-degree and the number of triplets with $R_2 = 0.2543$ and adjusted $R_2 = 0.253$ at $p < 0.05$. The plot in Figure A.2.4 illustrates the model in Equation 1. The vertical line corresponds to the x_{min} parameter estimated from the power-law test and shows that many of the followers that participated in the formation of triplets are influential under the criteria of power-law structures.

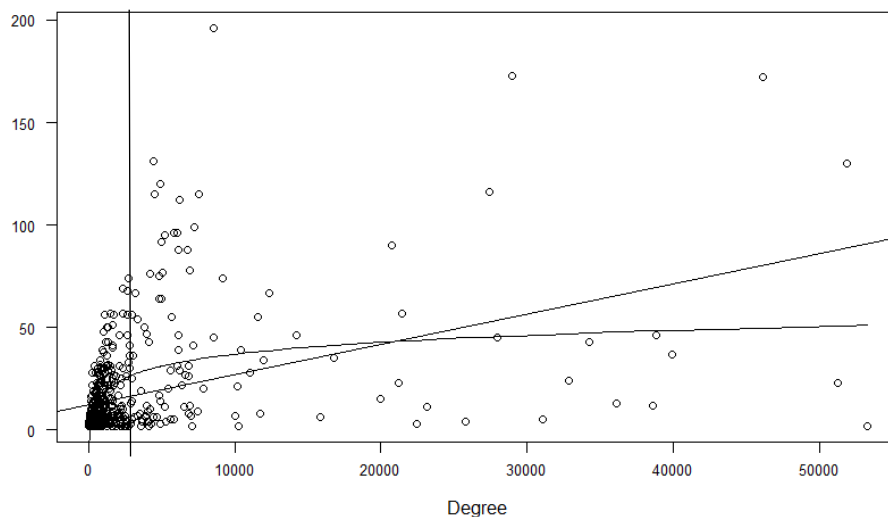


Figure A.2.4. Plot of the general model in Equation 1

Interpreting Curvilinear Effects

The plot in Figure A.2.4 also shows a linear correlation between the in-degree and the number of triplets with $R_2 = 0.1619$ and adjusted $R_2 = 0.1604$ at $p < 0.05$. However, I obtained a greater coefficient of determination ($R_2 = 0.253$) when taking the logarithm of the in-degree variable. When using variable transformations, increments in the coefficient of determination should be assessed to determine if “curvilinear effects” can improve the associations between the variables in the model (Hair et al. 2010, p. 176). The gain in the adjusted R_2 obtained by taking the logarithm of the in-degree variable suggests a curvilinear relationship between the in-degree and the number of triplets offers a better fit.

The transformation of variables is a common practice in the specification of regression models in situations “where nonlinear relationships between the dependent and independent variables are detected” (Hair et al. 2010, p. 173). The plot in Figure A.2.4 shows the number of triplets does not increase in the same ratio as the in-degree variable. In this case, a logarithmic transformation is suitable for capturing this type of relationship since the logarithm has the effect of bringing large values closer together and spreading out small values. In other words, the logarithm of the in-degree variable preserves the correlation between the number of triplets and smaller values of in-degree while it prevents larger values of in-degree to become widely dispersed as the number of triplets stay relatively unchanged.

The statistical significance obtained for the in-degree variable confirms the hypothesis that followers of the WSF with higher in-degree form greater number of triplets as the WSF gains new followers. Under the lens of the theoretical framework, the model suggests that highly connected users behave as actors of social-organizational resources that influenced, to some extent, the audience acquired by the WSF during the mobilization cycle captured in the measurement period. However, the logarithmic correlation suggests this relationship dwindles as the in-degree reaches extreme large values. Therefore, the model shows the process of audience acquisition captured in the measurement period was insensitive to the presence of users with a relative high follower count. Despite the primacy of power-law distributions in the literature for characterizing influence in social networks (Easley and Kleinberg 2010), and especially in Twitter networks (Kwak et al. 2010; Myers et al. 2014; Oh et al. 2012), the model shows that the high connectivity of influential actors did not translate into a significant greater audience acquired by the WSF.

Regarding practical significance, the low coefficient of determination ($R_2 = 0.2543$) obtained from Equation 1 accounts for about 25% of the variation in the number of triplets formed. It is known that human behavior in online environments exhibits high levels of heterogeneity (Li and Lai 2007). In Twitter networks, the literature numbers a broad range of factors that drive the formation of new linkages such as having connections in common (Gupta et al. 2013), shared interests (Weng et al. 2010), the desire for accessing information (Kwak et al. 2010), formation and maintenance of social capital (Ellison et al. 2007), and geographical proximity (Stephens and Poorthuis 2015) among others. Although the model shows a significant correlation exists between the popularity of current followers and the number of followers acquired over time, the findings open the way for exploring other factors that could lead to

models with higher explanatory power in predicting the elements that drive audience acquisition in online environments. For example, the time series presented in Figure A.2.2 could be further analyzed to understand how the dynamics of audience acquisition are not endogenous to the social network but bounded by external events. Otherwise, I could incorporate geospatial features to explain the incidence of geographical processes in the formation of new linkages (Liben-Nowell et al. 2005; Stephens and Poorthuis 2015) during cycles of online mobilization. In this line, we could measure the extent to which populations at specific regions follow ideologies promoted worldwide by social movement organizations or other social figures.

Analysis II

In a second analysis, I tested the hypothesis that followers of the WSF with higher in-degree form a greater number of triplets as the WSF gains new followers with the following regression model:

$$Num_Triplets_i = \beta_0 + \beta_1 \log(In_degree_i) + \beta_2 Location_i + \varepsilon \quad (2)$$

In this model, I also included the location of each follower, outlined by the longitude and longitude, as a moderator. The coordinates obtained from the geocoding process were not always accurate as users not always report a valid location in their profiles. I filtered out actors with invalid conversions resulting in a final working sample of 560 followers. I included the geographic coordinates of each follower in Equation 1 as qualitative (dummy) variables. For this purpose, I performed a cluster analysis to group together followers that are geographically close to each other. Since geographic coordinates are a type spatial data, I used the DBSCAN clustering algorithm (Ester et al. 1996). As a result, I obtained four clusters corresponding to four areas worldwide: western coast of North America, central part of Canada, eastern coast of Canada and Western Europe. I included these clusters as qualitative variables in Equation 3 leading to the following model:

$$Num_Triplets_i = \beta_0 + \beta_1 \log(In_degree_i) + \sum_{j=1}^4 \beta_j Cluster_{i,j} + \varepsilon \quad (3)$$

Variable	Estimate	Std. Error	t value	Pr(> t)
Intercept	-62.8824	6.5586	-9.588	< 2e-16 ***
Log(In_degree)	9.1353	0.5962	15.321	< 2e-16 ***
Cluster 1: Western coast of North America	7.8748	5.2676	1.495	0.135
Cluster 2: Eastern part of Canada	20.5309	4.9306	4.164	3.63e-05 ***
Cluster 3: Central part of Canada	-1.6859	8.0526	-0.209	0.834
Cluster 4: Western Europe	11.7009	8.6896	1.347	0.179

Figure A.2.3. Results of the general model in Equation 3.

The results of the final model presented in Figure A.2.3 indicates a significant logarithmic relationship exists between the in-degree and the number of triplets with $R_2 = 0.31$ and $F(5, 554) = 51.48$ at $p < 0.05$. Amongst the qualitative variables, only the cluster that corresponds to the eastern part of Canada was found significant. The plot in Figure A.2.4 illustrates the model in Equation 3 with cluster 2 labelled as “Major cluster” and the remaining clusters labelled altogether as “Others.” The vertical line corresponds to the x_{min} parameter estimated from the power-law test and shows that many of the followers that participated in the formation of triplets are influential under the criteria of power-law structures.

Interpreting the Results

The statistical significance attained for the in-degree variable confirms the hypothesis that followers of the WSF with higher in-degree form a greater number of triplets as the WSF gains new followers. However, the logarithmic correlation suggests this relationship dwindles as the in-degree reaches extreme large values.

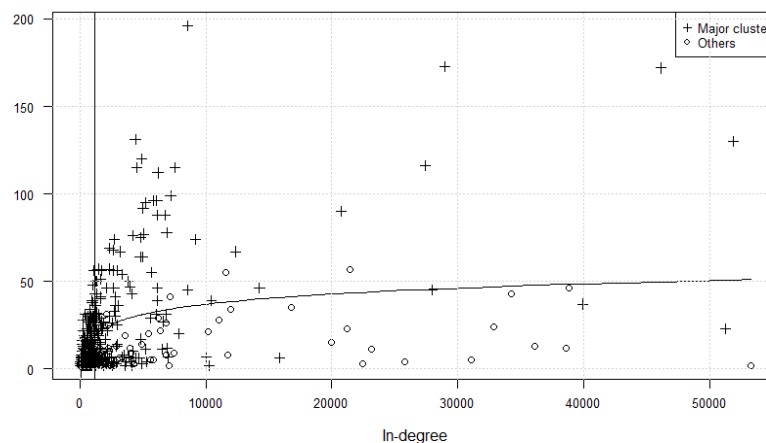


Figure A.2.4. Plot of the general model in Equation 3.

Under the lens of the theoretical foundation, the model suggests that highly connected users behave as actors of social-organizational resources that influenced, to some extent, the audience acquired by the WSF during the mobilization cycled captured in the measurement period. The model shows that the geographic location moderates this relationship as influential actors whose coordinates correspond to the eastern coast of Canada had a greater impact on the number of triplets they formed. This effect suggests that geographical aspects largely dominated the process of audience acquisition taken on by the WSF. This finding aligns with previous studies in which geographical proximity impacts processes of network formation (Liben-Nowell et al. 2005; Stephens and Poorthuis 2015). In the context of resource mobilization, I found interesting this effect given the global coverage of the WSF on its depiction as an important mobilizing structure for the global justice movement portrayed by several authors (Smith 2008; Staggenborg 2011; Tarrow 2005). Although the results of the cluster analysis reveal the acquisition of followers worldwide, the findings suggest that influential actors became

influential only for a geographically proximate population in terms of facilitating the WSF access to a broader audience.

A.2.3 Limitations and Future Work

In this study, I draw on theories of resource mobilization and social networks to build a framework for studying the role of online social networks as social-organizational resources available for social movements to expand their base of supporters.

This research has limitations which give direction for future study. The first limitation is that I focus solely on structural properties of social networks. Future work could include diffusion metrics, e.g. retweets, to explain the mechanisms employed by influential actors to spread the messaging of the global social movement. In this way, we could also assess how many of the followers acquired by a social movement organization indeed contribute to the promotion and support of its causes. Furthermore, the dwindling effect of users' popularity in predicting the formation of new linkages during processes of audience acquisition evidences the need for alternative measures of influence that pay less attention to the high values of followers count exhibited by popular figures. In this line, we could apply different measures of influence that involve actor's features and the way they disseminate information (Guille et al. 2013). For instance, metrics that capture the consistent creation and dissemination of content that is relevant (Pal and Counts 2011) to the ideologies advocated by a social movement. In this way, this study lays the groundwork for addressing a wider question concerning the factors that drive the propagation of ideologies in social media environments raised by actors of social movements and other social figures in their efforts for bringing about social change.

Appendix 3: Identifying Influential Authors in Microblogs¹⁷

In recent decades, information and communication technology (ICT) has profoundly transformed the way we interact with each other and access information (Ellison et al. 2007). Users of widespread ICT such as social media play the role of both consumers and producers of content (Ritzer et al. 2012) leveraging computer-mediated communication for spreading information in a variety of settings. At the same time, social media technologies like microblogging services enable users not only to create content but also to evaluate whether somebody else's contribution is worthy of attention (Boyd et al. 2010). In this manner, the ability of microblogging services for supporting a variety of communicative practices, and their efficiency for diffusing information to a large and diverse audience (Lerman and Ghosh 2010) afford efficient mechanisms for spreading situational information in periods of uncertainty (Oh et al. 2013; Oh et al. 2015; Starbird and Palen 2010).

For instance, Oh et al. (2015) explain how social media functioned as an engine for translating collective discomfort into collective action that led to the demise of the Egyptian president in 2011. In addition to the democratic uprisings of the Egyptian revolution, the role of social media has also been studied during the 2009 Moldovan parliamentary elections protests (Mungiu-Pippidi and Munteanu 2009), and the 2009 Iranian Green Movement (Burns and Eltham 2009). In these cases, social media acted as a platform for empowering individuals to take the role of social actors capable of moving forward ideas and transmitting messages with high informational values to large audiences (Plant 2004). Concisely, social media plays a major role in the way people "make of, cope with, and adapt to situational and informational uncertainties" (Oh et al. 2013).

The literature recognizes the potential of social media as an alternative channel for communicating situational information, but little is known about how the production and evaluation of online content lead to the emergence of influential authors that provide relevant and consistent information during the incidence of equivocal situations. Previous studies of influence in online environments have traditionally identified influential authors as those who have high network centrality scores (Johnson et al. 2015; Levina and Arriaga 2014). Although measures of network centrality when combined with textual properties capture important aspects of influence in online environments, these approaches tend to favor overly popular authors (e.g., celebrities) that are typically highly visible in the network (Pal and Counts 2011). In this study, I assert that during periods of turmoil and information uncertainty, traditional approaches for measuring user influence tend to overlook authors providing high informational values.

Drawing from organizational literature on processes of sensemaking and the perspective of technology affordances, I present a framework for distinguishing influential authors in microblogging sites. I present this framework as a design science artefact to answer the question: How to identify influential authors during periods governed by informational uncertainty? At the heart of the artefact, a model based on probabilistic clustering takes as input features for describing participants in microblogging sites to

¹⁷ This work was nominated by the Information Systems Department of the University of Auckland, Business School for participation in the Doctoral Consortium of the *International Conference on Information Systems (ICIS)* 2018.

demarcate a group of users that are more likely to be influential authors in contexts of situational ambiguity. As a first step for validating the artefact, I conducted a preliminary analysis using Twitter data collected in the aftermath of a blaze that caused the death of forty-one girls in Guatemala on March 2017. The design of the artefact contributes to the literature on the use of IT in social information processing by outlining an innovating approach for characterizing influence in online environments during periods of high uncertainty and societal breakdowns.

Theoretical Framework

Drawing from Gregor and Hevner (2013), I divide the literature review and theoretical framework underlying the design of the artefact in descriptive and prescriptive knowledge. In this fashion, I first draw on the conceptualization of sensemaking by Weick et al. (2005) to describe human behavior in the presence of information uncertainty (descriptive knowledge). Secondly, I describe current approaches in the literature for identifying influential users in the domain of microblogging services (prescriptive knowledge).

Sensemaking in Online Environments

Different sources of literature have directly discussed the notion of sensemaking to explain human behavior in the presence of information uncertainty and situational ambiguity (Aguirre et al. 1998; Oh et al. 2013; Weick et al. 2005). Sensemaking describes the process in which uncertainty drives people to search for meanings that allow them to make sense of reality (Mills 2003, p. 44). Efforts at sensemaking occur “whenever the current state of the world is perceived to be different from the expected state of the world” (Weick et al. 2005, p. 414). Whether in the context of formal organizations or at a broader societal level, the motivation for studying sensemaking stems from the inquiry of factors that precede and determine human action. When the course of reality feels different from what it should be, people first seek to construct a plausible sense to resume any interrupted activity (Weick et al. 2005), or if necessary, create a course of action to resolve the discrepancies and normalize the breach (Aguirre et al. 1998). When referring to sensemaking as an antecedent for human action, the core phenomenon is the interplay of interpretation and action and not the of evaluation of choice (Laroche 1995). In other words, the analysis moves beyond evaluating the outcome of decisions at the individual level to a point where context and individual action overlap. Shifting from decision-making to sensemaking makes possible the exploration of “potential powerful contextual features” (Weick et al. 2005, p. 410) that influence action.

Communication plays a crucial role in sensemaking as people rely on different media to engage in ongoing circumstances from which they extract cues to construct meaning and reduce uncertainty. Thus, sensemaking is, essentially, an issue of language, talk, and communication (Weick et al. 2005). Furthermore, the reliance on electronic forms of communication for accessing information enables a unique context for the development of sensemaking. In detail, Oh et al. (2015) studied how content created collectively on Twitter by the crowds enabled the emergence of symbols that funneled users’ attention to the social uprisings that sparked in Tunisia and then moved to Egypt and Libya (dubbed the spread of the 2011 Arab Spring). Oh et al. (2015) posits the first quantitative study that shows how the

collective production of online content shapes the production of meaning and sensemaking. In this fashion, collective sensemaking through ICT is understood as the result of the confluence of technology features and attributes that characterize human behavior (Oh et al. 2015). In the context of microblogs, users make use of technology features (Majchrzak and Markus 2012) such as user interfaces for creating, sharing and browsing content as part of their actions to search for meaning and make sense of equivocal inputs.

The Enactment-Selection-Retention Sequence

To explain how sensemaking develops in online environments, we first need to take a closer look at the underlying activities that comprise processes of sensemaking. The basic process assumed by sensemaking is one in which interpretations of circumstances build during interdependent interaction (Weick et al. 2005). Based on enactment theory (Jennings and Greenwood 2003) from the field of organization studies, Weick et al. (2005) conceptualizes sensemaking as reciprocal exchanges between actors (enactment) and their environments (ecological change) that are made meaningful (selection) and preserved (retention). Figure A.3.1 illustrates the sequence of ecological change-enactment-selection-retention (ESR) as part of the theoretical framework. The next paragraph summarizes the ESR sequence described by Weick et al. (2005).

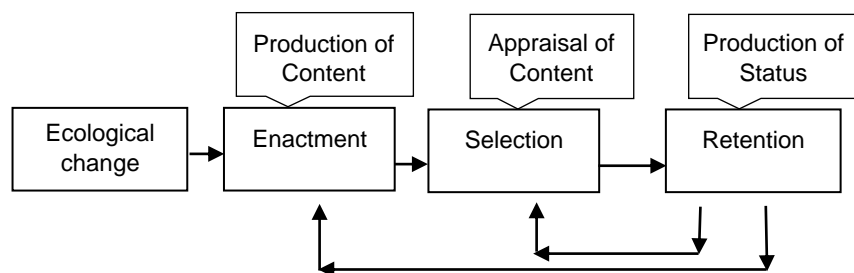


Figure A.3.1. Affordances for Sensemaking by Microblogging Services. Adapted from Weick et al. (2005)

Sensemaking starts with chaos (ecological change). Discrepancies and equivocality in ongoing circumstances trigger an early state of sensemaking. In this phase, people concerned with the current flow of events engage in the production of new meanings (interpretation) for something that has already occurred. This endeavor is marked by attempts for turning circumstances into a situation that can be comprehended explicitly in words (enactment). Activities of enactment may result in data that can mean several things. The number of possible meanings gets then reduced in the phase of selection. Here, communication takes place in the form of interactions by which knowledge is made more explicit or usable. During these exchanges, people evaluate different perspectives while identifying an account of the situation that would align with their values and norms. What is especially interesting here is that people try to “make sense of how other people make sense of things” (Weick et al. 2005, p. 413). As a result, a combination of attention and mental models based on life experience and normative frameworks perform a reduction of the produced material in the enactment phase that generates plausible stories. Though plausible, the stories that are selected are also tentative and provisional. Stories gain further solidity in the phase of retention. When an accepted story is retained, it ends to

become more substantial because it is connected to significant identities, and used as a source of guidance for interpretation in further activities of selection and enactment.

Social Media Affordances for Sensemaking

The emerging epistemology of technology affordances (Majchrzak and Markus 2012) in the information systems literature permits the consideration of action potentials that result from the intertwining of technology features and human attributes. In this study, I draw on the perspective of technology affordances as a frame for explaining how functionalities built into microblogging services enable processes of sensemaking.

This study takes the ESR sequence as a framework for dissecting sensemaking into specific activities that we can employ for explaining the development of sensemaking in online contexts at a broader societal level. On the side of describing technology features, I focus on two features that characterize microblogging services: the ability to create content that can be shared with other users of the system and the capacity to value existent content. In the presence of ecological change, the ability to create content enables the users to articulate their views on the ongoing circumstances and share their interpretations with other users. This functionality relates to the phase of enactment in the way that online content allows “lifting equivocal knowledge out of the tacit, private, complex, random, and past to make it explicit, public simple, ordered, and relevant to the situation at hand” (Weick et al. 2005, p. 413). The ability to value or appraise existent content enables the users to express their preferences and select information they deem relevant. This functionality relates to the phase of selection in the way that highly valued content allows the emergence of “a strong and coherent theme that differentiates from the multiple voices and chaotic interactions” (Oh et al. 2015, p. 212). Finally, the mechanisms for persisting and retrieving data commonly implemented in digital systems provide a natural association for the retention of content produced in the enactment phase and refined in the selection phase. In this study, I am more interested in analyzing the implications of the persistence of content that result from social processes of sensemaking. I discuss these implications to the production of status and influence in the next section. Drawing on the paradigm of technology affordances and the ESR sequence, I present in Figure A.3.1 a theoretical framework for describing sensemaking as an action potential (affordance) that results from the adoption of technology features available in current microblogging services for coping with information uncertainty and situational ambiguity.

Influential Authors in Microblogs

An important implication of the proposed framework in the previous section is the production of status and influence in online environments. A variety of studies has pointed out issues of how the creation and appraisal of content lead to the emergence of influential authors in online environments (Levina and Arriaga 2014; Pal and Counts 2011). The central idea is that any user-generated content platform provides a variety of status markers through which social distinctions can be acquired (Levina and Arriaga 2014). In the domain of microblogging services, the most common status markers are the number of a user’s followers, and positive ratings and comments on the content produced (Levina and Arriaga 2014). For Twitter networks, the frequency of retweeted messages and its authors have also

been employed as a measure of informational value and the Twitter users' influence (Oh et al. 2012; Overbey et al. 2013; Suh et al. 2010). The retweet feature, which consists on broadcasting others' original messages (tweets), has especially been recognized as a "popular instrument for information diffusion" (Oh et al. 2012, p. 5). Furthermore, the reasons why users "retweet" have been associated with mechanisms through which users express their agreement or interest on someone else's thoughts (Boyd et al. 2010). In this way, influential authors emerge as the result of decisions made by many users to retweet messages they deem worthy of passing on.

The motivation for turning the attention to the information diffusion features of microblogs is that highly diffused messages include informational and intelligible cues during uncertain situations. Salient agreements exist that the broadcasted messages or its authors "may have certain information values or influential voices in the online community in that the messages draw public attention from other users to be broadcasted" (Oh et al. 2012, p. 5). Regarding the ESR sequence, mechanisms for content selection act as markers of status through which influence is acquired. During processes of sensemaking afforded by microblogs, I argue the retention of selected content serves as a repository for the detection of influential authors proving consistent and accurate information. Thus, I argue the definition of measures based on status markers is central to the design of systems that aim to identify leading producers of content in online environments that influence the way the users cope with information uncertainty.

The most common methods for identifying influential authors in online environments have drawn on social network analysis (i.e., graph-based algorithms), conceptualizing distinction as a favorable position in a social network (Levina and Arriaga 2014). Within the microblogging domain, centrality measures based on eigenvectors have been the most popular graph-based approaches for the identification of influential users (Easley and Kleinberg 2010; Jackson 2011). The central idea behind measures of eigenvector centrality is that the importance of a node in a network comes from being connected to other important nodes. This notion has motivated the application of well-established algorithms like PageRank (Brin and Page 1998) in the characterization of influential users in microblogs (Gupta et al. 2013; Kwak et al. 2010; Weng et al. 2010). A notable example is TwitterRank, proposed by Weng et al. (2010), which computes the distribution of topics created by each user and constructs a weighted user graph where the edge weight indicates the topical similarity of any two users. They run a variant of the PageRank algorithm over the directed weighted graph, running the algorithm separately for each topic to find influential users on each topic.

In Twitter networks, the primary goal of models that blend topical and graph features for the identification of influential users is the design of user recommendation systems that capture the similarity between the users' interests and the content created by influential figures. For purposes of sensemaking, the emphasis is slightly different as it leans more towards the authoritativeness and coherence of the content in the aim of identifying users that provide relevant and consistent information. For this purpose, the principles underlying graph-based approaches favor inherently overly popular authors (e.g., celebrities) that are typically highly visible in the network of users because of extremely high values on status markers such as follower and retweet counts (Pal and Counts 2011). The problem is that

exceedingly popular users, although influential, do not produce content exclusively or even primarily on specific issues (Pal and Counts 2011).

The motivation for alternative measures of influence stems from the notion that “no individual can be a universal influence, and influential members of the network tend to be influential only in one or some specific domains of knowledge” (Guille et al. 2013, p. 24). The literature on leadership in online communities has also found influential participants are not those occupying the most central positions regarding network metrics, but those who are “highly active in many message threads concentrated on closely related topics” (Johnson et al. 2015, p. 181). In consequence, the main challenge is to distinguish microblogging authors of high topical value while downplaying the effects of disproportionately popular users (Ortiz and Tripathi 2017).

A.3.1 Method

In this section, I introduce the design of an artefact for automatically discovering users with high topical value in situations where information plays a crucial role in making sense out of unexpected events and uncertain situations. The method of the artefact builds on previous studies (Pal and Counts 2011; Weng et al. 2010) for the characterization of influence in microblogs that cope with the limitations of graph-based approaches for finding influential authors in specific domains. Figure A.3.2 presents a graphic description of the process described below.

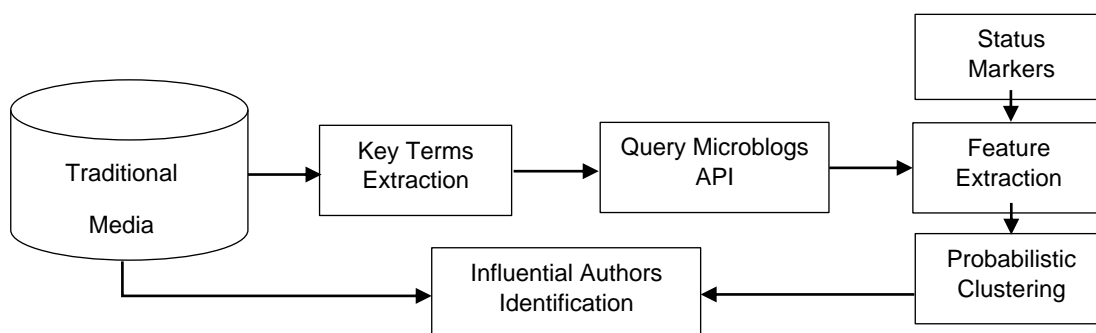


Figure A.3.2. Artefact Design for the Identification of Influential Authors

Artefact Description

The artefact first feeds on stories triggered by unexpected events (i.e., ecological change). Traditional media streams tend to be the first sources of situational information that try to deliver a plausible explanation to the ongoing circumstances. At the same time, citizens often turn to their local social networks or resources at hand to obtain information that is “relevant and needed for their understanding of the local situation” (Oh et al. 2013, p. 409).

Stories published in traditional media outlets can be used to extract informative terms around the situation. These key terms serve as queries to retrieve all content related to the situation that has been created in the blogosphere. Content is retrieved via application program interfaces (APIs) available on popular microblogging sites or crawling the websites directly. Content retrieved from the microblogging

sites is used for building a dataset, and features for describing each author (content producer) are constructed based on the concept of status markers outlined in the previous section.

At the heart of the artefact, a model based on probabilistic clustering takes as input the features to identify a group of users that are more likely to be influential authors. The reason behind using clustering models is that they allow the discovery of underlying structures or groups in large datasets. Drawing on work from Pal and Counts (2011), I model influential authors in microblogs as a particular group of users who exhibit features that characterize them among the rest of the users. Furthermore, probabilistic models provide more accurate representations for describing the underlying clustering structures using probability distributions. For the artefact, I use Gaussian Mixture Models (GMM) type of probabilistic models. The most remarkable improvement gained with GMM over other popular clustering models (e.g., K-means) is that cluster membership is described using conditional probabilities. Equation 1 below describes the canonical form used for calculating conditional probabilities in GMM. Assuming a set of j clusters, each cluster k is modeled as a multivariate normal distribution over the feature space. The parameters of the distribution (i.e., the mean μ and the covariance matrix Σ) are used as a condition for assessing the probability or responsibility (r_{ik}) for each cluster k to take a data point x_i as a member. The notion of normality provides a robust mechanism to prevent clusters from becoming sensitive to outliers or data points having extreme or disproportionate values in the feature space. In addition to the distributions parameters, GMM gives a weight π to each cluster to cope with differences in the population size of each distribution. As a result, a GMM model identifies the group (target cluster) containing all potentially influential users by taking the cluster with the highest means i.e., highest average values in the features constructed from the status markers.

$$r_{ik} = p(z_i = k \mid [\pi_j, \mu_j, \Sigma_j]_{j=1}^K, x_i) \quad (1)$$

Although the size of the target cluster may be smaller number compared to the total number of users, for larger datasets it may still need further reduction to provide a list of reasonable sizes for human comprehension. Since the main goal is to identify those users providing relevant information to the situation, I consider the topics that each author is engaged with rather than the subject of each single message. For this end, I aggregate all the messages produced by each user in the target cluster into a single document (Weng et al. 2010). Using traditional similarity metrics for information retrieval (e.g., Euclidean distance), we can then compute the similarity between the documents representing the stories obtained from traditional media outlets and the documents representing the content produced by each user. The rationale behind this heuristic is that users posting messages relevant to the ongoing circumstances have a closer distance to the stories obtained from traditional media. Finally, the resulting distances can be used to rank the most influential users within the target cluster.

Estimating Gaussian Mixture Models: A Preliminary Analysis

As a first step for validating the artefact, I conducted a preliminary analysis using Twitter data collected in the aftermath of a blaze that caused the death of forty-one girls in Guatemala on March 2017 (BBC News 2017). The tragic incident instigated deep feelings of dissent in the general population since the

victims, who all female aged between 14 and 17 years old, were living in a children’s care home operated by the government. During the aftermath, uncertainty was high as stories from diverse sources pointed out an array of factors surrounding the tragedy including reports of child abuse in the care home, the prosecution of government officials, the sorrow of the victims’ families and even claims that bands of drug dealers were also involved. Many people turned to popular social media channels to express their viewpoints, opinions, and indignation to identify an account of the situation.

I first collected a small sample of 5 articles from a popular newspaper in Guatemala and extracted a list of 5 keywords from an article related to the incident using term frequency–inverse document frequency (TF-IDF). I selected the words with the highest TF-IDF score to form a single query term to retrieve all related tweets from the Twitter Search API (Twitter 2017). I obtained a total of 251 tweets from the Twitter API. For each tweet, I identified the author and retrieved additional attributes from the Twitter API to construct a profile. I first explore the popularity of the users by running a simple regression model taking the number of followers as a predictor for the total number of tweets in the user’s profile. Figure A.3.3 (left) shows a significant relationship exists between these two variables. However, Figure A.3.3 (right) depicts this relationship dwindles significantly when considering only the tweets related to the incident appearing in the search results. This short analysis illustrates the scenario in which highly popular users, according to metrics like follower count, are not necessarily the most active when considering content related to specific incidents. A reason for this is that in the incidence of breakdowns or unexpected events, highly popular accounts belong to news outlets or celebrities that provide some input but do not engage deeply into the situation (Oh et al. 2013; Pal and Counts 2011).

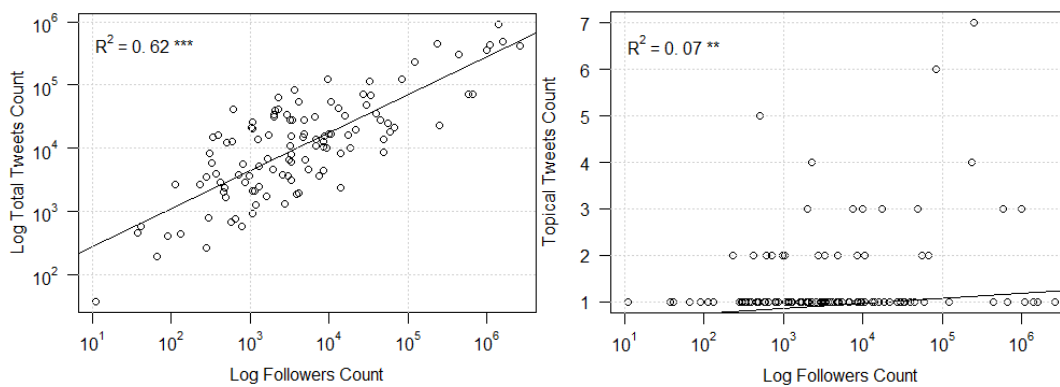


Figure A.3.3. Regression Analysis

For the probabilistic clustering part, I built a simple two-dimensional feature space to describe each author drawing on two popular status markers in Twitter networks: retweet count and follower count. I use retweet count to compute a more informative feature, namely tweet impact, by taking the ratio of the number of retweets to the total number of tweets. Accordingly, a higher value on tweet impact corresponds to a higher informational value on the tweets generated by the user on the search results. I then use these features as input to fit a GMM model. Figure A.3.4 shows the results of the clustering analysis using K-means (left) and GMM (right). K-means is often used to estimate the initial parameters of the GMM model. The final parameters of the model are estimated using maximum likelihood estimation (MLE), which essentially computes an estimate for the parameters of each cluster distribution

that maximize the probabilities in equation 1. Figure A.3.4 (right) illustrates two groups of users in the dataset. I am interested in the red cluster representing a group of users with a high tweet impact, although exhibiting a modest number of followers. To examine these users, I use information from the profile descriptions on Twitter to generate a qualitative description. Table A.3.1 presents the users with their description that are more likely to belong to the red cluster, i.e., users around the center (mean) of the red cluster. Table A.3.2 presents a list of users in the red cluster sorted by tweet impact.

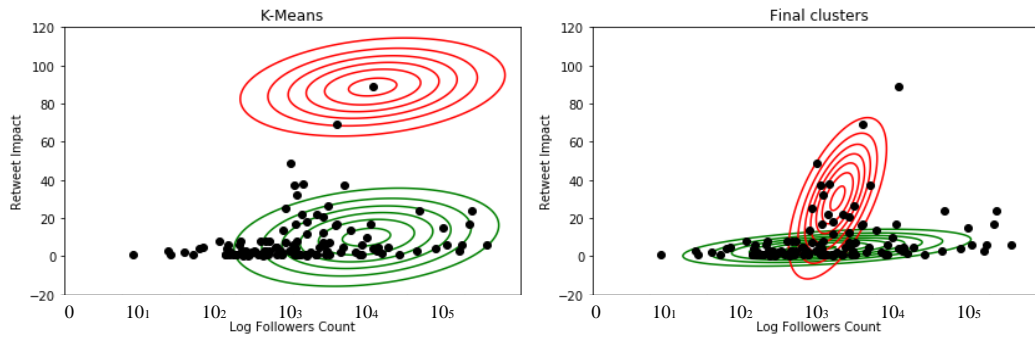


Figure A.3.4. Clustering Analysis

Table A.3.1. Top 10 Accounts in Red Cluster

Username	Tweet Impact	# followers	Description
julissa_eu	22.0	4,145	Radio presenter
Andreakomio	18.0	4,865	Activist
Hshetemul	22.0	6,871	Columnist
berflowersta	17.0	3,327	Student
FigueroaSarti	32.0	3,443	Editor
sangrederebelde	38.0	4,195	Social justice organization
PrensaComunitar	26.3	9,989	Journalism organization
alberarce	21.0	8,458	Journalist
AndreMalquin	37.0	3,188	Activist
PiccolaG7	25.0	2,310	Blogger

Table A.3.2. Top 10 Accounts in Red Cluster Ranked by Tweet Impact

Username	Tweet Impact	# followers	Description
nomadagt	88.7	48,639	Journalism organization
Fund_Adentro	69.0	14,115	Organization for social development
SOMOSgt	49.0	27,83	Social justice organization
sangrederebelde	38.0	41,95	Social justice organization
EcoFeminita	37.0	18,381	Social justice organization
AndreMalquin	37.0	31,88	Activist
FigueroaSarti	32.0	3,443	Editor
PrensaComunitar	26.3	9,989	Social justice organization
julissa_eu	22.0	4,145	Radio presenter
PrensaComunitar	26.3	9,989	Social justice organization
PiccolaG7	25.0	2,310	Blogger
julissa_eu	22.0	4,145	Radio presenter

A.3.2 Discussion

The descriptions of the accounts in Tables A.3.1 and A.3.2 reveal the presence of activists and social justice organizations amongst the most interested users in reporting an account of the situation. Studies concerning the role of social media during the aftermath of unexpected events involve social crises resulting from terrorist attacks and mass shootings (Oh et al. 2013), natural disasters (Starbird and Palen 2010), and social uprisings (Oh et al. 2015) largely motivated by the Arab Spring in 2011. This preliminary analysis aligns more with recent studies focused on social media as tools for human emancipation (Miranda et al. 2016; Selander and Jarvenpaa 2016; Zheng and Yu 2016). Under the lens of the theoretical framework, in the incidence of dramatic events that disrupt the norms and values accepted by the civil society, people is more susceptible to information to make sense of the situation. As a result, these breakdowns create opportunities for individuals and organizations promoting ideologies for societal transformation to reach a broader audience (Ortiz 2017). In this way, the artefact is designed to identify the most influential voices in social media environments during periods of societal breakdowns.

This study presents the design of an artefact to answer the question of how to identify influential authors during periods governed by informational and situational uncertainty. In the form of a preliminary analysis, this research also provides a short case study to demonstrate the feasibility of the proposed artefact. Under the research paradigm of design science, this study contributes to the literature on the

role of IT in social information processing by proposing an exaptation, i.e., “the adoption of known solutions to new problems” (Gregor and Hevner 2013, p. 345).

Although current approaches for the identification of influential authors (also known as topical authorities or experts) in microblogs address issues concerning the imbalance caused by extremely popular users, they do not provide a robust mechanism to describe relevance and consistency in the messages produced by potential influential users to specific incidents. This step is essential for improving the accuracy of the results in solutions that rely on clustering models. Pal and Counts (2011) proposes a self-similarity score based on how much a user borrows the same words from previous posts. The problem with this approach is that, although computationally efficient, it is highly susceptible to variations in the vocabulary employed. In the domain of reporting situational information, the topic of interest is the incident, and the vocabulary used to describe the situation might diverge as the stories accounting for the situation evolve. More recent approaches (Wei et al. 2016) propose the use of semi-supervised techniques that require prior user-curated lists of experts (e.g., Twitter lists) to improve the accuracy of unsupervised methods. Besides the dependency of this approach to features that are unique to Twitter that impedes generalization to other social media platforms, in the incidence of unexpected events these lists might not even exist. From a methodological perspective, my artefact is innovating in proposing a ranking mechanism using existent documents retrieved from traditional media sources to assess relevance.

From a theoretical standpoint, by extending traditional sensemaking theory to the social media context under the epistemology of technology affordances, this study provides the analytical lens to explain the role of influential users in periods of information uncertainty that result from the appraisal of content through status markers available in user-generated content platforms. This theoretical contribution fills the gap in the literature regarding the identification of “influential users directing processes of collective sensemaking” in online environments (Oh et al. 2015, p. 221).

A.3.3 Conclusion

This study presents a framework for identifying influential users in microblogging sites in the context of periods governed by informational uncertainty. This framework is relevant to the literature on the use of IT in social information processing given the importance of distinguishing influential users in assessing the validity of information produced in online environments (Schifferees et al. 2014). The literature acknowledges that unexpected events and social crisis are often followed by periods of information and situational uncertainty (Oh et al. 2013; Oh et al. 2015; Weick et al. 2005). Under these settings, information provided by traditional media channels is highly dominated by cultural influences (Oh et al. 2013) and institutional policies that are convenient and unthreatening to the media organizations' economic interests (Miranda et al. 2016). Therefore, unexpected events almost always involve “high traffic in social media websites through various forms of information diffusion such as linking, texting, tweeting, and retweeting” (Oh et al. 2013, p. 409). Recent studies have found that the trustfulness of the information sources is the most important rumor-causing factor across business and community crises (Oh et al. 2013). In this way, the identification of influential users is crucial for governments and

organizations interested in assessing the quality of social information produced in social media environments, especially in environments exhibiting high levels of social unrest. Thus, this study has practical implications in the assessment of reliable information produced in online environments.

Appendix 4: Power-law Distributions for Identifying User Roles

Under the rich-get-richer model, influential entities in an online environment can be measured by fitting the data to a power-law distribution (Jackson and Rogers 2007; Kwak et al. 2010; Oh et al. 2012). The interpretation of power-law distributions is that the most influential entities exist at the tail of the distribution with extremely high values in the metric of influence. Using the number of retweets as a measure of influence, I fitted this variable to a power-law distribution and estimated the x_{min} parameter that informs the point in the distribution that demarks the beginning of the heavy tail (Gillespie 2015). The estimation of the x_{min} parameter gave us the value of 38. The interpretation of this value is the minimum number of retweets that a tweet should have to be considered influential (in the sense of power-law structures).

By filtering out tweets with less than 38 retweets, I reduce the number of tweets from 11,862 to 372. The reason for such significant reduction is that many tweets in the data were retweeted a few times or not retweeted at all. The cumulative distribution function in Figure A.4.1-left of the number of retweets shows that the tweets authored by only 9 users (0.3%) captured 22% of all retweets in the Twitter messages. Such distribution depicts a power law structure (Figure A.4.1-right) anticipated by (Barabási and Albert 1999) and confirmed by previous Twitter studies (Miranda et al. 2016; Oh et al. 2012) in which a few influential Twitter authors' messages are "favored by extremely large numbers of other users" and a "majority of Twitter users' messages are minimally retweeted" (Oh et al. 2012, p. 7).

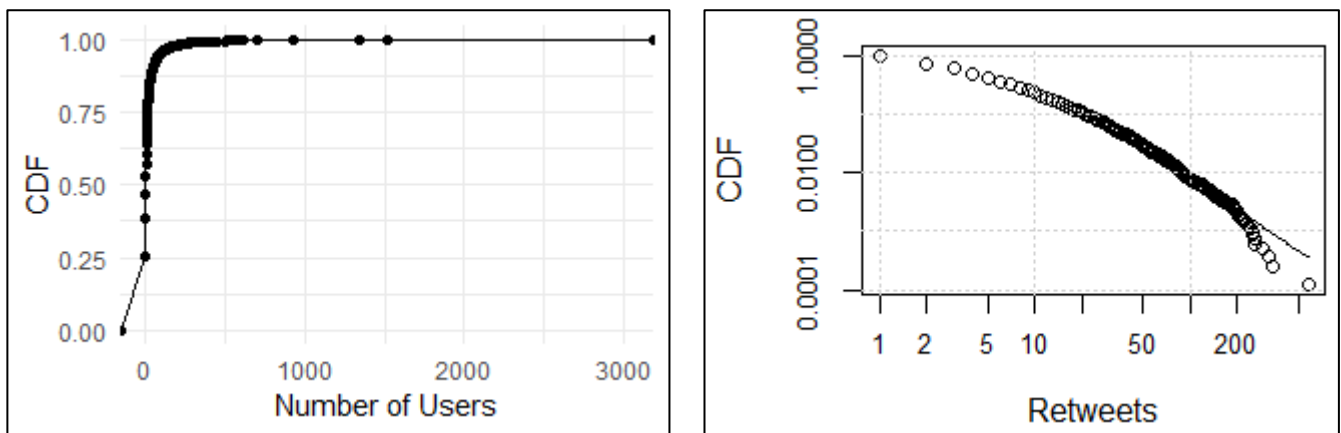


Figure A.4.1. Cumulative Distribution Functions

Focusing on Twitter communications between March 07 and March 20, 2017, enabled me to study processes of collective sensemaking during the chain of events surrounding the decease of the girls on March 08 and several crowd protests that emerged during the following days. Figure A.4.2 presents a visualization of the popularity, in terms of retweets, of the total of tweets collected (white area) compared to the tweets considered as influential (grey area). Figure A.4.2 aggregates the number of retweets by adding all the retweets for all the tweets on each day. The horizontal axis in Figure A.4.2 shows the period covered, which spans from March 07, the day many girls escaped from the care home, to 20th

March, 12 days after the fire. Note that the sample (grey area in Figure A.4.2) is an adequate representative of the total tweets collected in terms of retweet patterns.

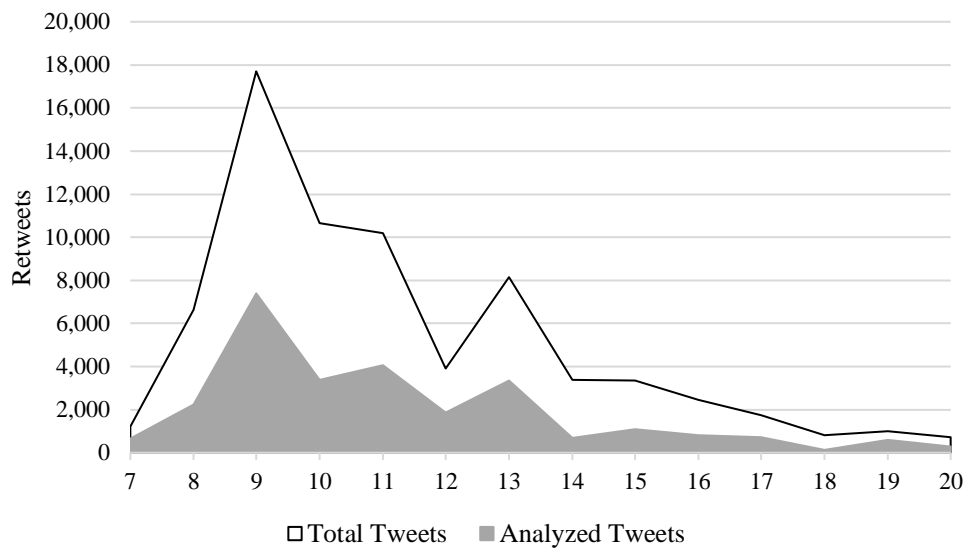


Figure A.4.2. Frequency of retweets aggregated by day

Following the principle of contextualization (Klein and Myers 1999), I identified classes or roles of the users responsible for authoring the tweets to explain the contributions of various social actors to the collective sensemaking process. To define the user roles, I examined the Twitter’s profile and content in the timelines of each user in the dataset¹⁸. Accordingly, I identified 11 roles: alternative media organization, individual, social movement organization, traditional media organization, journalist, private organization, university, public institution, activist, public servant, and government. Traditional media organizations consist of media outlets that also rely on means for broadcasting information invented before the Internet, such as newspapers, TV channels, and radio stations. On the other hand, alternative media organizations often hold critical perspectives of the status quo in society, culture, and politics (Atton 2004; Lievrouw 2011). The alternative media organizations in the analysis depend solely on digital technologies, such as social media, for the diffusion of their content.

Figure A.4.3 illustrates the total number of retweets by user role. The “individual” user role consists of users that were not identified as belonging to any of the other organizational roles. Figure A.4.3 depicts a scenario where diverse media organizations and SMOs took over the most influential roles in the dataset. The numbers to the right of each bar represent the number of unique users under each role.

¹⁸ Only public profiles were examined.

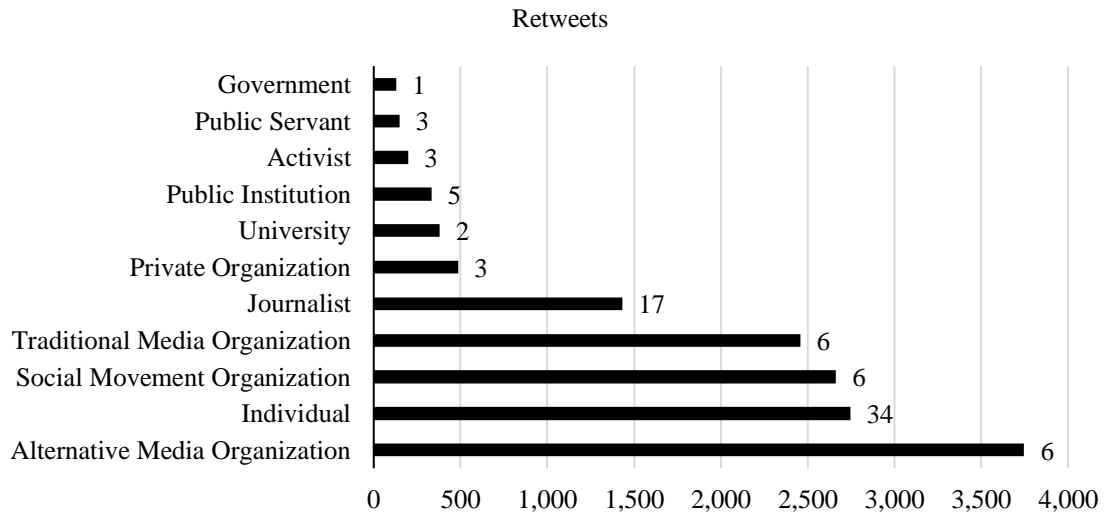


Figure A.4.3. Popularity by User Roles

Appendix 5: Clustering for Describing Usage of Twitter Features

This appendix describes an analysis that looks more precisely at how users engaged in the production of the content through their use of Twitter's features. To do so, I started examining the most notable qualitative differences in the ways in which actors used Twitter during the collective sensemaking of the tragedy.

To examine systematically the differences in how authors used various features of Twitter and how these differences enabled the enactment of different roles in the creation of different key terms, I turned to the cluster analysis. Table A.5.1 depicts the key Twitter features that I used for the cluster analysis. In addition to these features, I also included the total number of retweets obtained in all the tweets posted by each user as a measure of influence.

Table A.5.1. Key Twitter Features Used to Cluster Authors

Feature	Description
Tweet	Post a short message.
Link	Include references to external websites in the tweets.
Hashtag	Include hashtags in the tweets. A hashtag is a keyword or phrase that highlights an idea or topic of interest and facilitates a search for it.
Mention	Direct a tweet to another user.
Image	Include images in the tweets.

The cluster analysis resulted in three key clusters (provisionally named clusters 1, 2, and 3) characterized by marked differences in feature use as shown in Table A.5.2.

Table A.5.2. Average Feature Use per Cluster

	Size	Tweets	Retweets	Links	Hashtags	Mentions	Images
Cluster 1	68	22.823	344.323	7.264	31.485	11.676	15.220
Cluster 2	3	130.333	3636.000	43.666	175.333	62.333	99.000
Cluster 3	2968	2.079	13.508	0.653	3.425	0.766	0.930

Figure A.5.1 depicts a two-dimensional graphic representation of the clusters in Table A.5.2 where the points in green represent cluster 2, the points in black represent cluster 1, and the points in red represent cluster 3. The two dimensions are number of tweets (x-axis) and number of retweets (y-axis).

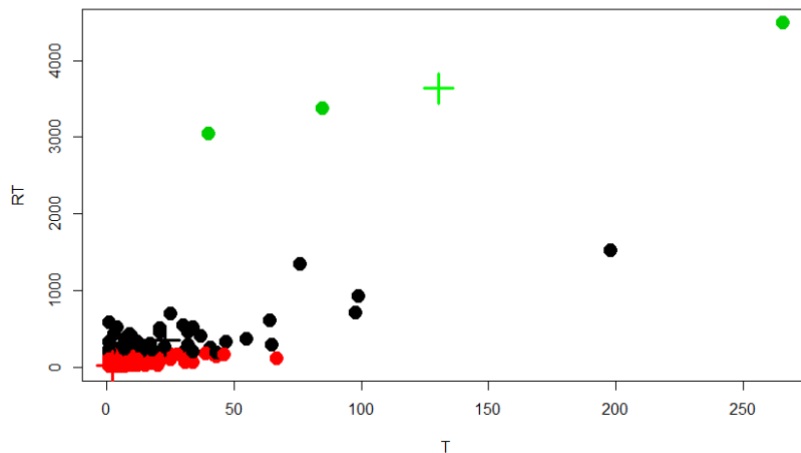


Figure A.5.1. Graphic Representation of Clusters in Table 2.6

Average feature use confirms that as users create more tweets, they make more use of all key features of Twitter (links, hashtags, mentions, and images). Cluster 2 was the smallest cluster (3 authors). However, it was marked by its posting activity (highest average number of tweets) and heavy use of all key features of Twitter (links, hashtags, mentions, and images). Cluster 1 was a larger cluster (68 authors). It was marked by some posting activity (moderate average number of tweets) and a limited use of all key features of Twitter.

Cluster 3 presented different pattern of feature use from clusters 1 and 2. It was also the largest cluster by far (2,968 authors). This cluster was marked by low posting activity (lowest average number of tweets) and by its nearly exclusive use of a single feature of Twitter, that of hashtags. Of all authors tweeting about the tragedy, 98% belonged to cluster 3.

A key insight from the cluster analysis is that the vast number of tweets was created by a small number of users (cluster 2). Furthermore, the tweets created by this small group gained a high number of retweets. We refer to the authors belonging to cluster 2 as “promoters”¹⁹ of denouncing the events surrounding the tragedy. The role of promoter was enacted as some users engaged in providing information aimed at explaining to the public the antecedents and social implications of the tragic event. The enactment of this role also involved framing the tragedy and thus bringing broader interest to the tragedy using multiple Twitter features.

These results confirm patterns of usage of Twitter features reported by previous studies (Oh et al. 2012; Vaast et al. 2017). Vaast et al. (2017) studied the interactions between these groups and the emergence of dynamic relationships between users belonging to different groups. However, no study has looked

¹⁹ Vaast, E., Safadi, H., Lapointe, L., and Negoita, B. 2017. "Social Media Affordances for Connective Action: An Examination of Microblogging Use during the Gulf of Mexico Oil Spill," *MIS Quarterly* (41:4) refers to users exhibiting patterns of usage similar as those of cluster 2 as “advocates.”

at how these patterns relate to the creation content with different meanings. Since I am interested in determining if there are groups of users responsible for the authorship of certain themes in the data, I will focus on patterns of features use by the users under the promoter role.

Table A.5.3. Feature Use of Promoters

	Tweets	Retweets	Links	Hashtags	Mentions	Images
User 1	85	3379	6	103	21	61
User 2	40	3043	7	63	6	23
User 3	266	4486	118	360	160	213

Although the promoters were grouped together by the cluster analysis, there are some interesting distinctions in their patterns of feature use. User 3 authored the largest number of tweets (68% more tweets than user 1 and 85% more tweets than user 2). The most notorious difference in patterns of feature use lies in the use of links. In average, 44%²⁰ of the tweets authored by user 3 included references to external sources (84% more links than user 1 and 61% more links than user 2).

Another distinct difference is the ratio between retweet and tweet counts. Although user 3 authored the most number of tweets, in average, tweets authored by user 3 were retweeted 78% less than tweets authored by user 2 and 58% less than tweets authored by user 1. If we take the average of number of retweets received by a user's tweets, then, user 1 and user 2 exhibit a greater degree of influence than user 1.

A less strikingly difference appears when comparing the use of hashtags. Tweets authored by user 3 included only 16% less hashtags than tweets authored by user 2 and 10% more hashtags than tweets authored by user 1. We observe also a similar pattern in the use of mentions and images.

Based on this empirical evidence, all promoters use a similar use of hashtags, mentions, and images. However, tweets authored by user 3 included more links, but were less influential (based on the number of retweets) than tweets authored by users 2 and 1. These findings suggest that user 1 was more engaged in informing the public about the tragedy through intensive posting, which in many cases, included references to external sources of information. Posting intensity from users 2 and 3 was minor but drew a higher degree of attention from their users. This suggests that tweets authored by users 2 and 3 were more engaging that the content created by user 1.

To further understand how the use of different Twitter features relates to the authorship of different key terms and how this usage influences the collective sensemaking of the tragedy, I performed a second run of word count-based analyses focused on the tweets created by each promoter.

²⁰ For calculating the average use of links, I recognize the fact than links usually appear once in tweets (i.e., a tweet rarely includes more than one link), thus by dividing the number of links by the number of tweets we can estimate the average number of tweets that included a link.

Table A.5.4. Key Terms per Promoter in the Twitter Communications about the Tragedy

Word	Frequency	Word	Frequency
Promoter 1 (User 1 in Table A.5.3)			
#ItWasTheState	73	Square	3
@jimmymoralesgt	14	Central Park	2
#ForTheGirls	13	National Palace	2
Pain	8	Consequences	2
President	8	Let's go	2
#JusticeNow	6	We must	2
Rage	4	March	2
Presidential House	3		
Promoter 2 (User 2 in Table A.5.3)			
#ItWasTheState	17	Protesters	3
#ForTheGirls	14	Presidential House	3
#ConclusionsSafeHome	5	Crime	2
#NotOneLess	5	Congress	2
#GuatelsInMourning	5	#TragedySafeHome	2
Promoter 3 (User 3 in Table A.5.3)			
#GuatelsInMourning	137	#Now	16
Tragedy	50	@hospitalRoosvelt	11
Minors	31	@jimmymoralesgt	11
Victims	28	Constitution Plaza	10
Guatemalans	22	Adolescents	10

Table A.5.4 depicts the results of the word count-based analysis approach applied to the content created by each promoter. The key terms obtained in this round of analysis display interesting differences among promoters. Promoter 1 was highly engaged in the authorship of content aimed at pointing out the culprits of the tragedy. The hashtag “#ItWasTheState” and mention of the official account of the Guatemalan President (“@jimmymoralesgt”) appearing as the most frequent used terms used by Promoter 1 illustrate a powerful intent to portray the Guatemalan government as responsible for the tragedy.

A set of less frequent key terms used by Promoter 1 including “Presidential House,” “Square,” “Central Park,” and “National Palace” echoes a common theme of references to localities. A closer look at the tweets issued by Promoter 1 reveals a high use of the Tweeter posting feature for announcing and promoting protests at different locations in Guatemala City. On the other side, tweets authored by Promoter 2 set also an accusatory tone but at a more moderate stance. The use of a more diverse set of terms like “#ConclusionsSafeHome,” “#GuatelsInMourning,” “Congress,” and “Protesters,” suggests that Promoter 2 was engaged in the production of content aimed at offering a broader view of the events surrounding the tragedy. Similarities between the content produced by Promoter 1 and 2 includes terms

like “#ForTheGirls” depicting a “call to arms” and “#JusticeNow” and “#NotOneLess” highlighting an unjust act. Finally, the content created by Promoter 3 exhibits a wider range of themes using different key terms. In a similar fashion to Promoter 2, content authored by Promoter 3 aimed at informing the population about the development of the events in the aftermath of the tragedy.

By looking at the profiles of the promoters in the Twitter Website, we can identify Promoter 1 as a local social movement organization (SMO) with a political agenda concerned with corruption in the Guatemalan government. Promoter 2 is a media organization focusing primarily on social issues with a common stance against the status quo in politics in Guatemala. Promoter 3 is a media organization in Guatemala which holds the position of the most popular newspaper in Guatemala.

The following statements summarize the findings of the analysis in this section:

- Promoter 3’s usage of Twitter was characterized by intense posting and heavy use of links. As a media organization, the recurrent use of links in posts aligns with a role of informing and providing information to the public about the events surrounding the tragedy.
- Promoter 2, although being identified as a media organization, used a relative smaller number of links in its tweets. Such tweeting behavior suggests Promoter 2 was more engaged in framing the events surrounding the tragedy than providing information through external sources. The word count-based analysis reveals content produced by Promoter 2 emphasized the Guatemalan state as responsible for the tragedy and the girls as victims of an injustice.
- Promoter 1 played a more salient role in framing the tragedy as an injustice that cannot be left in impunity and makes explicit calls for demonstrating against the perpetrators of the tragedy.
- Although Promoter 3 had a greater exposure due to its status as a popular media organization, posts authored by Promoters 1 and 2 drew more attention, suggesting these authors prompted greater engagement from their followers. This finding demonstrates a greater potential for framing content with respect to factual descriptions of events to draw public attention. The analysis also reveals common themes in the frames related to “who to blame,” and “what to do.”
- These findings exemplify how social media, in this case Twitter, enables the creation of different types of content and how Twitter’s features can be used to serve and amplify the messaging of diverse social actors when creating their content (e.g., through links, hashtags and mentions).

Appendix 6: Sample of Manual Coding

Media Genre	Alt. Media Genre	User	Text	informative	injustice	accusatory
alternative_media	mediated_mobilization	justiciayagt	El caso del Hogar Virgen de la Asuncion es muestra de que la ineptitud del Ejecutivo no es motivo de bromas está costando vidas #JusticiaYa	0	0	1
alternative_media	mediated_mobilization	justiciayagt	El único accidente es este presidente @jimymoralesgt #FueEIEstado	0	0	1
alternative_media	mediated_mobilization	justiciayagt	No fue un accidente fue una ejecución grita la gente afuera del Palacio Nacional. #FueEIEstado pic.twitter.com/2boHPAifM6n	1	0	0
alternative_media	mediated_mobilization	justiciayagt	Mujeres y niños tejen disculpas alumbrados por candelas. En silencio. #FueEIEstado pic.twitter.com/LbHpFWEuSw	1	0	0
alternative_media	mediated_mobilization	justiciayagt	Estado fallido sos un asesino #FueEIEstado pic.twitter.com/yFvAflG9iC	0	0	1
alternative_media	mediated_mobilization	justiciayagt	Este es el país en donde @jk_rowling se manifiesta por una tragedia de 30 muertes de niñas antes que @jimymoralesgt. #FueEIEstado	0	0	1
alternative_media	mediated_mobilization	justiciayagt	Altar en el parque central a estas horas. #FueEIEstado pic.twitter.com/tkg9Xkd6DL	1	0	0
alternative_media	mediated_mobilization	justiciayagt	Si hubieran sido sus hijas habrían roto la puerta #FueEIEstado pic.twitter.com/on2eaYr85v	0	0	1
alternative_media	mediated_mobilization	justiciayagt	Corrupto y feminicida estado genocida #FueEIEstado pic.twitter.com/zk7HbKUZT	0	0	1
alternative_media	mediated_mobilization	justiciayagt	Ah! ¡No eran calladitas y eso no les gusto! #FueEIEstado #JusticiaYapic.twitter.com/sr6J1Lp0EF	0	0	1
alternative_media	mediated_mobilization	justiciayagt	Todas las candelas están prendidas. #PorLasNiñas pic.twitter.com/QWzKciGTft	0	1	0
alternative_media	mediated_mobilization	justiciayagt	Solidaridad desde Nueva York con las víctimas de la tragedia del Hogar Seguro. #FueEIEstado pic.twitter.com/2H8K7UY47D	0	1	0
alternative_media	mediated_mobilization	justiciayagt	En una burla que Bancada FCN quiere responsabilizar a @PDHgt de lo sucedido en #HogarSeguro y proteger a @jimymoralesgt #DepuracionCongreso	0	0	1
alternative_media	critical_journalism	nomadagt	No fue un accidente fue una ejecución. El único accidente es este presidente. #NoFueUnAccidente #NosFaltan36 #GuateDeLuto #FueEIEstado	0	0	1
alternative_media	critical_journalism	nomadagt	Fuera del Palacio Nacional los ciudadanos exigen justicia. Nos faltan 36 #FueEIEstado #NiUnaMenospic.twitter.com/TuEDJmVvli	1	0	0
alternative_media	critical_journalism	nomadagt	Más de 400 personas reunidas frente a Casa Presidencial exigen justicia para las niñas del Hogar Seguro #FueEIEstado #NiUnaMenospic.twitter.com/GBqy54bIM	1	0	0
alternative_media	critical_journalism	nomadagt	Tenemos más preguntas @jimymoralesgt Usted estaba enterado de todo desde el martes. ¿Por qué no hizo nada para evitarlo? #GuateDeLuto	0	0	1
alternative_media	critical_journalism	nomadagt	Manifestación fuera de Casa Presidencial exige justicia para las niñas fallecidas en incendio en el Hogar Seguro Virgen de la Asuncion. pic.twitter.com/oyVm1AcBjz	1	0	0
alternative_media	critical_journalism	nomadagt	Se está solicitando apoyo psicológico para las niñas y niños del #HogarSeguro. Si pueden apoyar comuníquense al 5466-1317 o al 3098-0699.	1	0	0
alternative_media	critical_journalism	nomadagt	Jimmy cantinfla y finge surfers incluso en televisión internacional. Así evita más preguntas. #ConcluHogarGuate #porlasniñas	1	0	0
traditional_media		prensa_libre	#AhoraPL Varias personas piden "Justicia y Castigo" por las niñas del Hogar Virgen de la Asuncion en la Plaza Central. Foto: @jdavila_plpic.twitter.com/UL6ogEy7Yx	1	0	0
traditional_media		prensa_libre	¿Qué pasa en el Hogar Virgen de la Asuncion? ¿Cuál fue la causa? ¿Qué antecedente tenía el lugar? A continuación se lo detallamos: pic.twitter.com/4qrXitpaHT	1	0	0
traditional_media		prensa_libre	#GuateDeLuto Nuestra portada está en blanco y negro porque nos duele como a todos los guatemaltecos esta tragedia http://bit.ly/Xeza6FÁ pic.twitter.com/S7TR4YCaOf	0	1	0
traditional_media		prensa_libre	#GuateDeLuto Cuatro de nueve adolescentes del #HogarSeguro trasladadas a Xela están embarazadas http://bit.ly/2ld5lmÁ pic.twitter.com/gplxZMSiS	1	0	0
traditional_media		prensa_libre	#GuateDeLuto Médicos especialistas en quemaduras del Hospital Shriners para niños de Galveston #EEUU llegan al @HospigenGT pic.twitter.com/wjqTonyOJ	1	0	0
traditional_media		prensa_libre	#GuateDeLuto En las afueras de Casa Presidencial guatemaltecos se pronuncian por la muerte de las niñas del #HogarSeguro. Ft: @jdavila_plpic.twitter.com/JTCyBcoUfd	1	0	0
traditional_media		prensa_libre	#GuateDeLuto Cientos de guatemaltecos se solidarizan con las víctimas del #HogarSeguro. Exigen justicia por las niñas. Video: Oscar Rivas.pic.twitter.com/VY4bfie3EZ	1	0	0
traditional_media		prensa_libre	#GuateDeLuto Nuestra portada estará en blanco y negro porque nos duele como a todos los guatemaltecos esta tragedia http://bit.ly/Xeza6FÁ pic.twitter.com/R0hwyfITUp	1	0	0
traditional_media		prensa_libre	#GuateDeLuto guatemaltecos llegan a la Plaza de la Constitución para rendir homenaje a las víctimas del #HogarSeguro. Fotos: Paulo Raquecpic.twitter.com/KpdlXKrUPv	1	0	0
traditional_media		prensa_libre	#GuateDeLuto Diputada de la comisión de Derechos Humanos asegura que no hay resguardo del lugar donde fue el hecho pic.twitter.com/A9Kjylumlo	1	0	0

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