

Surviving Sandy: An Analysis of Social Media Use in Response and Recovery Efforts

By

Emily Mann

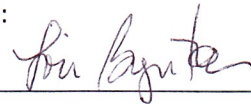
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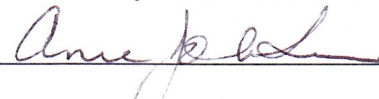
University of North Carolina at Chapel Hill

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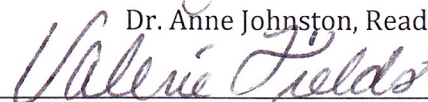
Approved:



Dr. Lois Boynton, Thesis Advisor



Dr. Anne Johnston, Reader



Dr. Valerie Fields, Reader

Abstract

Hurricane Sandy devastated the northeastern United States in October of 2012. Many of those impacted by the storm took to social media to look for answers from disaster responders. Organizations like the American Red Cross and the Federal Emergency Management Agency (FEMA) have become increasingly reliant on social media as a crisis management tool. This paper analyzes the use of Facebook and Twitter by these organizations and their subsidiaries through a content analysis of their postings during the timeframe of the storm. Guided by Coombs' Situational Crisis Communication Theory, the results from this study yield important findings and advice for disaster management practitioners in the future. Most notably, these discoveries demonstrate an overall lack in the organizations' use of social media as a two-way communication stream. Advice for the future includes involving more employees and volunteers in the management of the organization's social media accounts and incorporating a more personal approach to their responses to individual users. There is still much to be learned from the integration of social media as a tool for disaster response, and it is important that practitioners keep up with the ever-evolving media landscape that governs the world in which we live.

Dedication and Acknowledgments

Dedication:

The destruction from Hurricane Sandy has left a lasting impact on New York and New Jersey. This thesis is dedicated to all those who suffered loss in the storm and to those who worked endless hours to deliver aid to those in need.

Acknowledgments:

Writing this thesis has been a rollercoaster and I could not have done without the overwhelming amount of support and guidance I received from Lois Boynton. Never questioning my determination to look at EVERY post, her door was always open when I was in need of advice or encouragement, and I never needed an appointment. Thank you for continuously giving me the motivation to keep pushing forward and for sharing my passion for this topic.

I would also like to thank Anne Johnston for her faith in my research. I came into this project knowing nothing about public relations or how to perform academic research, yet the weekly support I received from you and my fellow classmates provided me with the motivation I needed to succeed.

Late nights spent entering data would have been much later, had it not been for the amazing companionship of my parents, Brian and Tracey Mann. They constantly inspire me to work harder and harder each day. I would not be who I am today without the constant love and support from you both.

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Chapter 1: Introduction and Literature Review

Introduction

Background

Hurricane Sandy hit the northeastern United States on October 29, 2012.¹ The storm battered the Mid-Atlantic, Northeast, and Ohio Valley regions for three days,² but cleanup efforts lasted much longer. Record-setting storm surges of over thirteen feet impacted coastal communities,³ with waves reaching thirty feet at New York Harbor and almost forty feet in Atlantic City.⁴

This “Frankenstorm” contained a unique combination of weather patterns causing it to transform into a hybrid storm.⁵ Superstorm Sandy was the only tropical cyclone in the history of weather reporting in the United States that caused both hurricane and blizzard conditions simultaneously.⁶

The impact of the storm reached 24 states directly, causing dramatic complications for millions of Americans.⁷ 25 million people live in the tri-state area of Connecticut, New Jersey, and New York, which experienced much of the impact of Hurricane Sandy.⁸ From October 27 to November 1, airlines cancelled 20,000 flights

¹ Justin Pidot, “Deconstructing Disaster,” *Brigham Young University Law Review* 2 (2013): 214.

² Jeffrey B. Halverson and Thomas Rabenhorst, “Hurricane Sandy: The Science and Impacts of a Superstorm,” *Weatherwise*, March 1, 2013, 15.

³ Pidot, “Deconstructing Disaster,” 214.

⁴ Pidot, “Deconstructing Disaster,” 214.

^{5,6} Halverson and Rabenhorst, “Hurricane Sandy,” 16.

⁷ Halverson and Rabenhorst, “Hurricane Sandy,” 21.

⁸ Melinda Knight, “Communicating in a Crisis,” *Business Communication Quarterly* 76 (2013): 3.

due to the storm⁹ and power outages in 17 states left over 8 million people in the dark (some for weeks).¹⁰ The Superstorm caused \$40 billion in damage and forced congress to approve over \$60 billion in aid for disaster victims.¹¹ This is in addition to the support funded by the American Red Cross.

The magnitude and destruction of Hurricane Sandy makes the storm a target for comparisons with Hurricane Katrina. The death toll for Sandy was 125, while approximately 1,800 died in Katrina.¹² But due to the population density in the Northeast, the destructive power of the storm had a much larger impact, with 570,000 building destroyed in Sandy, compared to 233,000 in Katrina.¹³

Disaster response teams came from across the nation to help in the Northeast. The immediate needs for those affected were met by a combination of governmental organizations and nonprofit groups. From providing food and shelter to rescuing stranded victims, volunteers worked endless hours in the days immediately following Hurricane Sandy. For months after the storm, clean up teams worked to clear debris and rebuild.

Purpose

The purpose of my research was to analyze the crisis response by the government and the Red Cross in the wake of Hurricane Sandy. Specifically, my research looked at the use of social media as a crisis management tool. By evaluating and comparing the strategies of these two entities, I have formulated advice for use

^{9, 10} Halverson and Rabenhorst, "Hurricane Sandy," 21.

¹¹ "Superstorm Sandy Aftermath," *Congressional Digest* 92 (2013): 17.

^{12, 13} Halverson and Rabenhorst, "Hurricane Sandy," 21.

in future natural disaster responses. My research has implications for both nonprofit and government first responders.

To understand the importance of incorporating social media strategies into crisis management approaches for natural disasters, it is important to first dissect and understand the individual theories that govern crisis management and social media. The literature review serves to define these terms individually, exposing their key components to examine how they can be used in conjunction to formulate a successful communication plan to keep the public informed during a crisis. The following section will also detail background information on previous attempts by the Red Cross and FEMA to respond to natural disasters, most significantly Hurricane Katrina.

Literature Review

Defining Crisis

There is not a universal definition of crisis. Depending on the specific situation, crises can be defined in a variety of ways. A 2004 study by Heath and Millar discusses multiple ways of defining crisis, many of which include references to “a mistake or dramatic turning point,” “the need for management efforts beyond normal or routine procedures,” “inadequate control” or uncertainty, and “weak preparation and inadequate preventions.”¹⁴ The central focus of all of these definitions revolves around control over the situation.¹⁵ Other definitions stress the

¹⁴ Robert L. Heath, “Introduction Crisis Communication: Defining the Beast and Demarginalizing Key Publics,” in *The Handbook of Crisis Communication*, ed. W. Timothy Coombs and Sherry J. Holladay (Chichester: Blackwell Publishing Ltd, 2010), 3.

¹⁵ Heath, “Introduction,” 3.

potential of negative outcomes of mishandling events.¹⁶ Coombs reserves the use of the term “crisis” for serious events that require attention from officials in the position of management.¹⁷ It is this theory by Coombs that governs my application of crisis in the context of this paper.

A number of definitions are important to build a clear understanding of the strategies used in responding to a crisis. Crisis management, crisis communication, and the distinction between a crisis and a disaster are all individual pieces that come together to define Coombs’ theory.

Crisis Management

According to Coombs, crisis management is “a set of factors designed to combat crises and to lessen the actual damages inflicted.”¹⁸ This management aims to mitigate the negative outcomes from a crisis event. This includes a process entailing measures to prevent crises, plans of action for crises, and evaluations of previous crisis management.¹⁹

Crisis Communication

Communication during a crisis can be divided into three phases. Pre-crisis communication covers what an organization says and does before a crisis occurs, including reducing risks. In a natural disaster situation, this would include predicting and alerting citizens to impending storms. The crisis stage revolves around the process of responding to the event, including the implementation of

¹⁶ W. Timothy Coombs, “Parameters for Crisis Communication,” in *The Handbook of Crisis Communication*, ed. W. Timothy Coombs and Sherry J. Holladay (Chichester: Blackwell Publishing Ltd, 2010), 18.

¹⁷ Coombs, “Parameters,” 19.

^{18,19} Coombs, “Parameters,” 20.

communication strategies. Finally, post-crisis communication includes follow-up after a crisis, developing strategies to prevent recurrence and learning from the past to have a better response in the future.²⁰

In Coombs' model, crisis communication is focused on following a specific crisis category/crisis response technique, which will be discussed shortly.

Distinction From Disaster

According to the Handbook of Crisis Communication, all disasters spawn crises, but not all crises are disasters.²¹ There are several unique factors present in disasters that impact communication strategies used by crisis managers. The US government defines a disaster as, "A dangerous event that causes significant human and economic loss and demands a crisis response beyond the scope of local and State resources. Disasters are distinguished from emergencies by the greater level of response required".²² This type of large-scale event requires communication to be coordinated between multiple agencies.²³ Often this is within government entities and between the government and nongovernmental organizations.

Natural disasters are also distinct from other crisis-causing events because they are triggered by natural forces.²⁴ No force can stop the path of a storm; crises of this type must revolve around mitigation, instead of prevention.²⁵

²⁰ Coombs, "Parameters," 20.

²¹ W. Timothy Coombs, "Crisis Communication and Its Allied Fields," in *The Handbook of Crisis Communication*, ed. W. Timothy Coombs and Sherry J. Holladay (Chichester: Blackwell Publishing Ltd, 2010), 59.

²² "Principles of Emergency Management," (Washington, DC: Emergency Management Institute, 2003). *

²³ Coombs, "Crisis Communication," 60.

²⁴ Pidot, "Deconstructing Disaster," 215.

In the upcoming section, Coombs' Situational Crisis Communication Theory will be examined in its totality, and then the portion pertaining specifically to response strategies for natural disasters will be investigated more closely.

Crisis Communication Theory

Situational Crisis Communication Theory (SCCT)

Coombs developed the leading theory for organizational response in the wake of a crisis.²⁶ Coombs' Situational Crisis Communication Theory identifies three major crisis categories ("clusters") and the response strategies that correspond with each type of crisis. This serves as a template for crisis managers to coordinate their responses based on the public's perception of responsibility.²⁷

Crisis Categories

According to Coombs, "crisis responsibility is a major factor in determining the threat posed by a crisis."²⁸ His set of guidelines for categorizing crises takes the public's perception into account. Situational crisis communication theory (SCCT) forms three groupings: the victim cluster (low crisis responsibility/threat), the accident cluster (minimal crisis responsibility/threat), and the intentional cluster (strong crisis responsibility/threat).²⁹ The victim cluster includes events where the organization is also the "victim" of the crisis, examples of which include natural disasters, rumors (false information circulating), workplace violence, and product

²⁵ Heath, "Introduction," 7.

²⁶ Hilary Fussell Sisco, Erik L. Collins, and Lynn M. Zoch, "Through the Looking Glass: A Decade of Red Cross Crisis Response and Situational Crisis Communication Theory," *Public Relations Review* 36 (2010): 23.

^{27, 28} Coombs, "Parameters," 38.

²⁹ Coombs, "Parameters," 39.

tampering (by an external actor).³⁰ Accident cluster events are spurred by the unintentional actions of the organization, which includes ethical challenges by the public (the organization is operating in an inappropriate manner), technical-error accidents (equipment failure causes an industrial accident), and technical-error recalls (equipment error forces a recall).³¹ And intentional events occur when organizations knowingly take actions that place people at risk or violate the law.³² Human-error accidents, human-error product recall, and organization misdeeds fall into this category because they are seen as being intentional or they could have been prevented.³³

Intensification of Blame

There are two factors that can intensify the public's perception of blame toward an organization in a crisis.³⁴ First, if an organization has a history of past crises, this may form a pattern of "bad behavior", leading the public to hold the organization to a higher degree of responsibility.³⁵ Likewise, a negative reputation prior to a crisis will carry over during a crisis, leading to more blame placed on the organization.³⁶

³⁰ W. Timothy Coombs, "Impact of Past Crises on Current Crisis Communication," *Journal of Business Communication* 41 (2004): 267.

³¹ W. Timothy Coombs, "Protecting Organization Reputations During a Crisis: The Development and Application of Situational Crisis Communication Theory," *Corporate Reputation Review* 10 (2007): 163.

^{32, 33} Coombs, "Protecting Organization Reputations," 168.

^{34, 35, 36} Coombs, "Parameters," 39.

Crisis Response Strategies

In the SCCT model, crisis managers choose the correct response strategy according to the amount of responsibility placed on the organization in crisis.³⁷ For the victim cluster, a deny strategy is utilized in an attempt to prove the organization has no responsibility for the crisis because either the crisis did not happen or someone (or something) else was responsible for the event.³⁸ Diminish strategies are used for events in the accident cluster that seek to minimize an organization's responsibility and reduce the seriousness of the crisis.³⁹ Finally, rebuild strategies try to improve perceptions of the organization by compensating or apologizing to victims of the crisis event.⁴⁰

Coombs' theory defines an overall communication strategy when given a specific type of crisis. In the next section, new communication technologies – specifically social media – will be discussed and their implications for crisis response will be examined. It is the goal of this research to bridge the gap between Coombs' theory and current literature on the use of social media.

New Technologies in Communication

The communications revolution, spurred by the invention of mobile phones and the Internet, has sped up mass communications to a point that demands the fundamental rethinking of disaster management plans. Already, social media (in the form of blogs, social networking sites, and texting) have shaped the coordination of

³⁷ Coombs, "Parameters," 41.

^{38, 39, 40} Coombs, "Parameters," 40.

response to disasters, with two major benefits.⁴¹ First, they are able to form a connection between the leader of an organization and the people directly experiencing the crisis.⁴² And secondly, they can be utilized to correct misinformation, which has the possibility of derailing other crisis management strategies by creating confusion and causing further problems for organizations involved in a crisis.⁴³

According to research conducted in the aftermath of Hurricane Katrina, the Internet and mobile phones were the most common resources used by people to stay connected and disseminate information following the disaster.⁴⁴

Defining Social Media

The uniqueness and complexity of social media compared to other communication forms has left researchers with a difficulty in defining the medium. The term “social media” can be used to define the new technologies emerging since the mid-1990s that revolve around the usage of the Internet to connect multiple users.⁴⁵ According to the Pew Internet & American Life Project, social media is “an umbrella term that is used to refer to a new era of Web-enabled applications that are built around user-generated or user-manipulated content.”⁴⁶ Social media form

^{41, 42, 43} “How Social Media Are Changing,” 3.

⁴⁴ Joo-Young Jung and Munehito Moro, “Multi-Level Functionality of Social Media in the Aftermath of the Great East Japan Earthquake,” *Disasters* 38 (2014): #. Jung and Moro, “Multi-Level Functionality,” 126.

⁴⁵ Bruce R. Lindsay, “Social Media and Disasters: Current Uses, Future Options and Policy Considerations,” *Journal of Current Issues in Media & Telecommunications* 2 (2010): 287.

⁴⁶ Pew Internet & American Life Project, “Web 2.0” (2010)

a diverse group of Internet-based platforms⁴⁷ that allow for user collaboration in the production of media content.⁴⁸ The spread of information is instant and response from other users is immediate.⁴⁹

Adam Crowe, in his article “The Social Media Manifest,” ascribes a more socially conscious definition to the term “social media.” According to Crowe, “a shared connection of people and/or organizations is created with common values and interests, and choosing to engage in the exchange of information for the common good” is the goal of social media platforms.⁵⁰ There is an inherent trust found between users because of the “shared network of friends” that composes the system.

Kaplan and Haenlein describe six functions and services of social media that help to define boundaries of what categorizes this type of technology.⁵¹ These can be outlined as collaborative projects (Wikipedia), content communities (YouTube), blog websites, virtual social worlds (Second Life), virtual game worlds (World of Warcraft), and social networking sites (Facebook, Twitter).⁵²

⁴⁷ Aino Ruggiero and Marita Vos, “Social Media Monitoring for Crisis Communication: Process, Methods and Trends in the Scientific Literature,” *Online Journal of Communication & Media Technologies* 4 (2014): 106.

⁴⁸ Jeannette Sutton et al., “Warning Tweets: Serial Transmission of Messages During the Warning Phase of a Disaster Event,” *Information, Communication & Society* 17 (2014): 1.

⁴⁹ Brenda K. Wiederhold, “In a Disaster, Social Media Has the Power to Save Lives,” *Behavior & Social Networking* 16 (2013): 782.

⁵⁰ Adam Crowe, “The Social Media Manifesto: A Comprehensive Review of the Impact of Social Media on Emergency Management,” *Journal of Business Continuity & Emergency Planning* 5 (2011): 410.

⁵¹ Andreas M. Kaplan and Michael Haenlein, “Users of the World, Unite! The Challenges and Opportunities of Social Media,” *Business Horizons* 53 (2010): 61.

⁵² Jung and Moro, “Multi-Level Functionality,” 128.

For the purpose of crisis communication, the functionalities of social networking sites provide the most valuable utilities for a widespread response strategy. Twitter and Facebook not only feature an interface that is easily adapted on mobile devices, but also offer other functions that are beneficial to crisis response across a community. Twitter, for example, features a retweet (RT) function that allows one user to repost another user's message to his/her own timeline, which can be helpful for quickly spreading a message during a crisis.⁵³ Additionally, the 'hashtag' (#) function marks keywords in a user's tweet (#hurricane, for example), which makes it possible to organize and search for tweets pertaining to the same topic. Comparably, fan pages on Facebook connect users with common interests to content producers including organizations that deal with crisis response, like the Red Cross.⁵⁴

Other research creates a further distinction, marking social networking sites (Facebook) and micro-blogs (Twitter) as distinct entities. In an article by the Institute of Management and Administration, social networking sites are defined as "online communities that allow users to connect, interact, and exchange information with those who share interests and/or activities," whereas micro-blogs are described as "a form of blogging that allows users to write brief text updates (usually 140 characters max.) and publish them so that the networks can view and comment on them".⁵⁵ From this classification, micro-blogs like Twitter, are seen as

⁵³ Jung and Moro, "Multi-Level Functionality," 128.

⁵⁴ Jung and Moro, "Multi-Level Functionality," 130.

⁵⁵ "How Social Media Are Changing," 4.

the most beneficial for notification during a disaster because of their growing user base and history of successful usage during crisis.⁵⁶

The Role of Social Media in a Crisis

In a 2009 study by Hughes and Palen, research revealed that people are more likely to use social media sites like Twitter to spread information during an emergency situation than for its traditional purpose of interpersonal interactions.⁵⁷

Current usage of social media during crises has followed the trajectory predicted by Bruce Lindsay's 2011 report for Congress. He foresaw social media's use as a tool for emergency management in issuing warnings, receiving requests for assistance from victims, and monitoring situational awareness.⁵⁸

Social media can be accessed on a plethora of platforms (computers, tablets, smartphones/mobile phones, SMS text messages),⁵⁹ which opens the door for crisis communication in times when traditional communication methods may be limited (due to downed power lines/telephone lines).

Issues

There are several potential problems associated with the use of social media during a crisis. Due to the speed with which information spreads over social media, there are possible problems institutions could face with regards to accuracy in the messages being sent.⁶⁰ Also, there is some concern over malicious use of social

⁵⁶ "How Social Media Are Changing," 4.

⁵⁷ Amanda L. Hughes and Leysia Palen, "Twitter Adoption and Use in Mass Convergence and Emergency Events," *International Journal of Emergency Management* 6 (2009)

^{58, 59} Lindsay, "Social Media and Disasters," 287.

⁶⁰ Lindsay, "Social Media and Disasters," 292.

media by the deliberate spread of incorrect information to confuse people, especially from accounts impersonating official sources.⁶¹ Verified social media accounts help to curb this. But during a crisis, the sheer amount of information being spread online can become problematic, with information overload actually slowing down the delivery of important messages. And finally, an organization's overreliance on technology may be an issue in disasters that last for a prolonged period of time because cellphone batteries will eventually die, and without power to recharge them, this will disrupt all social media efforts to coordinate disaster response.⁶²

Organizations Involved in Crisis Response

There are various organizations that are strategically positioned, by virtue of their mission, to respond to crises.⁶³ These include nonprofit organizations, like the Red Cross, and government agencies like the Federal Emergency Management Agency (FEMA).⁶⁴

For these organizations that have functions outside of mitigating a response to natural disasters, maintaining a good reputation allows them continue to be able to support society in times of crisis.⁶⁵ Communicating effectively with the public is important for administrative bodies like these so that they can sustain a positive reputation, which allows them continued success after a crisis has passed.⁶⁶ In the case of nonprofit organizations, their success often relies on their relationship with

^{61, 62} Lindsay, "Social Media and Disasters," 293.

^{63, 64} Heath, "Introduction," 2.

^{65, 66} Fussell Sisco, Collins, and Zoch, "Through the Looking Glass," 21.

the public because that is their main source of funding.⁶⁷ For this reason, nonprofits are often held to higher standards when crises strike.⁶⁸

Large natural disasters have the tendency to grab the public's attention. This puts a spotlight on the organizations working closely to resolve the crisis. The response efforts made by the government and nonprofits in the wake of Hurricane Katrina came under fire for their tardiness and incompetence in aiding victims. This example illustrates the importance of maintaining a good public perception during a disaster.

Criticism of Hurricane Katrina

Both FEMA (a governmental organization) and the Red Cross have been criticized for their "inept response" to Hurricane Katrina⁶⁹ based on the allocation of financial assistance and the time it took to for relief to arrive.⁷⁰ The Red Cross specifically faced problems from Hurricane Katrina due to a "lack of control over local chapters," an "inability to provide volunteers," and the questionable "distribution of donations."⁷¹ Additionally, research suggests that the impact of Katrina might have been less devastating if communication was more effective to mobilize response efforts.⁷²

^{67, 68} Fussell Sisco, Collins, and Zoch, "Through the Looking Glass," 22.

^{69, 70} Fussell Sisco, Collins, and Zoch, "Through the Looking Glass," 21.

⁷¹ Fussell Sisco, Collins, and Zoch, "Through the Looking Glass," 22.

⁷² Gabriel L. Adkins, "Organizational Networks in Disaster Response: An Examination of the US Government Network's Efforts in Hurricane Katrina," in *The Handbook of Crisis Communication*, ed. W. Timothy Coombs and Sherry J. Holladay (Chichester: Blackwell Publishing Ltd, 2010), 93.

Additionally, Hurricane Katrina illustrates an example of how a disaster can become a crisis for organizations involved in crisis response.⁷³ Poor management caused a different type of crisis to develop because the organizations involved in the distribution of aid were viewed by the public as incompetent.⁷⁴ The hurricane hitting the Gulf Coast was the disaster, but the actual response caused a crisis.⁷⁵ In essence, the Red Cross was reacting to two crises: the impact of the natural disaster (victim cluster) and a lousy response to the Hurricane (accident cluster).

Challenges faced in Hurricane Katrina can give us guidance for how to respond to natural disasters in the future. Implementing revised systems for the rapid dissemination of information, localizing communication efforts, developing new channels of communication, disseminating information through partnerships, and adapting messages for local use⁷⁶ will all have a positive impact on future response efforts.

Justification

Importance

Natural disasters continue to be a problem for the American people. In 2011, the federal government declared ninety-nine major disasters in the United States,⁷⁷ including wildfires, floods, blizzards, hurricanes, and earthquakes.⁷⁸ As people continue to build their homes and businesses in areas susceptible to recurring

^{73, 74, 75} Coombs, "Crisis Communication," 60.

⁷⁶ Adkins, "Organizational Networks," 99.

⁷⁷ Pidot, "Deconstructing Disaster," 214.

⁷⁸ Pidot, "Deconstructing Disaster," 215.

natural disasters, losses from these events will increase dramatically,⁷⁹ especially in areas as densely populated as the American Northeast. People put themselves in danger by living in areas that are vulnerable to hurricane destruction, but there is little chance of this trend changing anytime soon.

“Electricity and information are the twin life bloods of modern societies. If electricity and information are disrupted, then everything from the production of food to the supply of potable water, to ATM service – literally everything in modern society – grinds to a halt. We are truly coupled and interdependent as never before”.⁸⁰ This quote from Ian Mitroff’s book *Why Some Companies Emerge Stronger and Better from a Crisis: 7 Essential Lessons for Surviving Disaster* emphasizes the importance of strategic crisis management in American society, especially in the wake of a natural disaster.

The speed of social media, its ability to connect thousands and even millions of people within minutes of a disaster, has a tremendous potential to save lives.⁸¹ Harnessing this power to spread information effectively during natural disasters is imperative to improving crisis response techniques in an ever-changing technological environment.

Global Warming

According to the Niels Bohr Institute, by the end of the twenty-first century global warming could cause a greater proportion of hurricanes to become

⁷⁹ Pidot, “Deconstructing Disaster,” 213.

⁸⁰ Laura Lally, “Information Technology and Crisis Compliance: Implications for Studying Hurricane Sandy,” *Proceedings for the Northeast Region Decision Sciences Institute (NEDSI)* (2013): 116.

⁸¹ Wiederhold, “In a Disaster,” 781.

devastatingly destructive.⁸² This means that by 2100, Superstorms (like Hurricane Sandy and Hurricane Katrina) are predicted to become ten times more common.

Since 1995, storm counts have been exceedingly above the long-term average of 11 named-storm systems per year.⁸³ Additionally, these storms have been overwhelmingly destructive in recent years.⁸⁴ This increase in hurricanes shows a need for the development of better crisis communication techniques to mitigate the effects of natural disasters with the advantages and disadvantages that advanced technology provide.

Need For Research

Traditional approaches to crisis response indicate that organizations should respond in the wake of a crisis quickly and with all of the details.⁸⁵ But in the midst of natural disasters like Hurricane Sandy, that is not always so easy to do.

On the other hand, people are adopting new technologies more quickly than they have before, and it will become imperative that emergency managers harness the power of social media to keep up with the public's demands.⁸⁶ In 2012, Hurricane Sandy was the second most-talked-about topic on Facebook.⁸⁷ Facebook and Twitter are well established as the most-popular social media platforms, and as such, should be the primary source for social media deployment by emergency

⁸² H.K., "Superstorms Like Hurricanes Katrina and Sandy Will Become Ten Times More Common by 2100," *Futurist* 48 (2014): 41.

^{83,84} Halverson and Rabenhorst, "Hurricane Sandy," 15.

⁸⁵ Knight, "Communicating in a Crisis," 3.

⁸⁶ Lindsay, "Social Media and Disasters," 291.

⁸⁷ Wiederhold, "In a Disaster," 781.

managers presently.⁸⁸ As technology changes, however, emergency managers should stay on top of advancements made in the field of communication.

Though crisis communication and social media technology are relatively new topics of research, there is a lot of literature available about them. What the research fails to demonstrate, however, is the extent to which these two topics can be combined to hasten the spread of information in a disaster situation. It is the goal of my research to fill in these gaps and provide advice for crisis managers for the incorporation of social media into crisis response strategies for the future.

Research Questions

While investigating the Red Cross and FEMA's use of social media leading up to, during, and after Hurricane Sandy, my research aimed to answer the following questions about the current state of social media usage as a disaster management tool.

RQ 1: How are crisis communicators currently employing social media in their response to natural disasters?

RQ 2: How does an organization adapt its message between different social media platforms?

⁸⁸ Crowe, "The Social Media Manifesto," 411.

Chapter 2: Methods

To understand the link between social media and crisis response strategies, a content analysis was conducted. This examined how Red Cross and FEMA subsidiaries used social media during Hurricane Sandy. The unit of analysis for this data collection was on the level of individual posts by the organizations. From the accounts selected, all of the tweets and Facebook posts were included in the study.

Identifying Accounts

A total of 10 accounts on Twitter and Facebook were selected to track their postings (3,041 in total) in the days before, during, and after Hurricane Sandy made landfall. Whenever possible, the same account was examined on both platforms, so that the entities' engagement with different forms of social media could be studied. However, some organizations only operate on one of the social media platforms and some data were unavailable for the selected timeframe.

Accounts were selected based on their proximity to the location of the storm. For this purpose, only accounts representing organizations in New York and New Jersey were utilized because these states faced the most-serious impact of Hurricane Sandy. During the storm, these areas had the highest number of casualties and the biggest financial burden in recovery due to property damage.

For the Red Cross, the study focused on the organization's national, regional, and local accounts. This gave a good representation of the hierarchical structure of the organization and showed how information flows between the three groups. All of the accounts chosen for the study were verified with the national office through links on their website.

The research into government agencies involved in crisis response during natural disasters was also divided into three groups: FEMA, FEMA’s regional partner (Region 2 – covering New York, New Jersey, Puerto Rico, and the US Virgin Islands), and state emergency response/emergency management agencies in New York and New Jersey. This mirrors the hierarchical structure present in the organization of the Red Cross. Though fewer accounts were selected for this data set, the quantity of postings is equal between the two groups. These accounts were also verified by FEMA’s national organization.

Statistics were collected from these accounts to determine the number of followers, how long the account has been active, and their frequency of posting during the storm. Accounts with fewer than 200 followers or those that were created after the storm or did not post during the storm timeframe were not included in the study. Table 1 displays the accounts that were chosen for the study and their respective twitter handles and Facebook pages.

Table 1: Accounts Chosen

American Red Cross	@Red Cross facebook.com/RedCross
Red Cross – North Jersey Region	@RedCrossNorthNJ facebook.com/AmericanRedCrossNorthJerseyRegion
Red Cross – South Jersey Region	@RedCrossSouthJersey
Red Cross – Greater New York	@RedCrossNY facebook.com/redcrossNY
Red Cross – Long Island	@LIRedCross facebook.com/LIRedCross
Red Cross – Metro New York	@RedCrossMetroN facebook.com/metronynorthredcross
FEMA	@FEMA facebook.com/FEMA
FEMA Region 2	@FEMARegion2
New Jersey Office of Emergency Management	@ReadyNJ facebook.com/READYNEWJERSEY
New York Office of Emergency Management	@NotifyNYC facebook.com/nycemergencymanagement

Profiles of the accounts selected for the study are available in Appendix A.

Use of Both Twitter and Facebook

The research has been split between Twitter and Facebook, the two most popular social media sites during the timeframe of the study. These two platforms showcase different ways of spreading content. Twitter focuses on short, directive messages to the public, while Facebook features more long-form posts and has the ability to include more information in its messages.

These two media are easily compared, however, because they have similar measures to track their effectiveness. Each features a redistribution function that allows individual users to repost a message from an organization/figure to his/her own timeline. This is known as “retweeting” (RT) on Twitter and “sharing” on Facebook. Additionally, it is possible to track public opinion on social media through the “like” function on Facebook, which is comparable to Twitter’s “favorite” function. Furthermore, both platforms allow the use of “hashtags” (#) which make it easier to track posts with similar content.

The only category of data that could not be compared between Twitter and Facebook in this study was the timestamp of the posts. Though Facebook does record a timestamp in an account’s most-recent postings, its archived data does not include this information. Therefore, the timing data for Twitter has only been compared in reference to other accounts.

Defining Variables

The study looked at three specific timeframes to determine how the organizations’ use of social media changed throughout the phases of the storm:

storm preparation, the storm itself, and clean up. This mirrors Coombs' three crisis stages. Storm preparation dates covered the timeframe from when the storm was declared a hurricane (October 22, 2012) to when it first made landfall in the United States (October 29, 2012). The heaviest impact of the storm itself was between October 29 and October 31, 2012, so these dates were used as boundaries to gauge response during the actual storm. Clean-up efforts began immediately after the storm and continued for many months. However, for the purposes of this study, the data will be confined to looking at the first week of clean up (ending November 7), as it is during this timeframe that the victims' most-immediate needs were met.

Source of Data

The data for coding were collected through archival services on the Internet. Facebook keeps its archives accessible to the public through the dated timeline feature on a user's account. Simply scrolling back and revealing "all stories" from a given time period will reveal all of a user's posts from the dates selected. This is how data were gathered from the Facebook accounts. Twitter, however, offers only limited access to an account's archives. For this data, TweetTunnel's application program interface (API) was used to access the last 3,200 tweets from each account. Because some accounts tweet more than others, this was a limiting factor in the data that could be retrieved from the timeframe of the study.

Coding System

Coding was completed by two undergraduate students. The coding system collected a variety of information about the content of the organizations' tweets and Facebook posts, as well as other characteristics of the posts. Because both social

media platforms are so similar, the same coding sheet can be used for both sets of data.

The main intent of the posts was categorized into the following groups: (1) storm tips and general storm information, (2) weather information, (3) shelter locations, (4) availability of food and water, (5) power and fuel information, (6) transportation information, (7) safe and well lists, (8) promoting usage of web applications, (9) asking for donations and fundraising, (10) volunteer and response coordination, (11) personal responses, and (12) other topics related to non-storm functions of the organization. For example, this last theme included postings for blood drives and other events not related to the storm. Only the dominant theme was selected for each post.

The use of hashtags was also investigated across the body of data. This was divided to assess the use of official terminology (#sandy) versus colloquial phrases (#frankenstorm, for example). Each post was coded for the presence or absence of a number of hashtags found commonly used during conversations about the storm.

Additionally, the number of retweets/shares for each post and the number of favorites/likes was tracked. Coding for these data included exact figures and an average for each account was calculated.

Other characteristics investigated included the time of day that the post was uploaded, how many characters the post contained, the language in which the post was written, and if the post contained an image. In addition, coders looked at the original source of the post and the presence of links to other users and external websites.

The complete coding book followed by the researchers can be found in Appendix B.

Coding and Intercoder Reliability

Coders were trained using the coding sheet found in the appendices. A paper code sheet was filled out for each post and then was separately entered electronically into Qualtrics Survey Software to analyze the results.

To determine intercoder reliability, a sample of 450 posts was doubled coded and the results were compared using simple agreement, according to Holsti's formula.⁸⁹ In 10 of the 14 categories of coding, the coders had 100% agreement across the sample. Regarding the presence of an image, the presence of an external weblink, and the presence of a user mention, the coders demonstrated an agreement coefficient of 0.99. In the case of theme, the coders had an agreement coefficient of 0.88 and further clarity was given to the defining of categories. All of these percentages are well within reason for a reliable study, according to Holsti.⁹⁰

Limitations

As mentioned previously, data were not available for some accounts. The Red Cross of Greater New York (@RedCrossNY) Twitter account has tweeted more than 20,000 since its creation in 2009. It was impossible to go back that far into the archives without requesting the user to download their privately kept archives. There were also some accounts (Red Cross – South Jersey Region and FEMA Region 2) that did not have active Facebook accounts during the time of Hurricane Sandy.

^{89, 90} Kimberly Neuendorf, *The Content Analysis Guidebook* (Thousand Oaks: Sage Publications, 2002), 149.

Another possible limiting factor in the research is the inability to view and track posts that have been deleted. This may unintentionally skew the data to a slightly more effective view of the organizations' use of social media during the Hurricane Sandy time frame because the organizations have had the opportunity to delete any unfavorable or ineffective messages. This could be corrected in research of future natural disasters by capturing the data in real-time, but this would require knowledge of a storm/event prior to its occurrence.

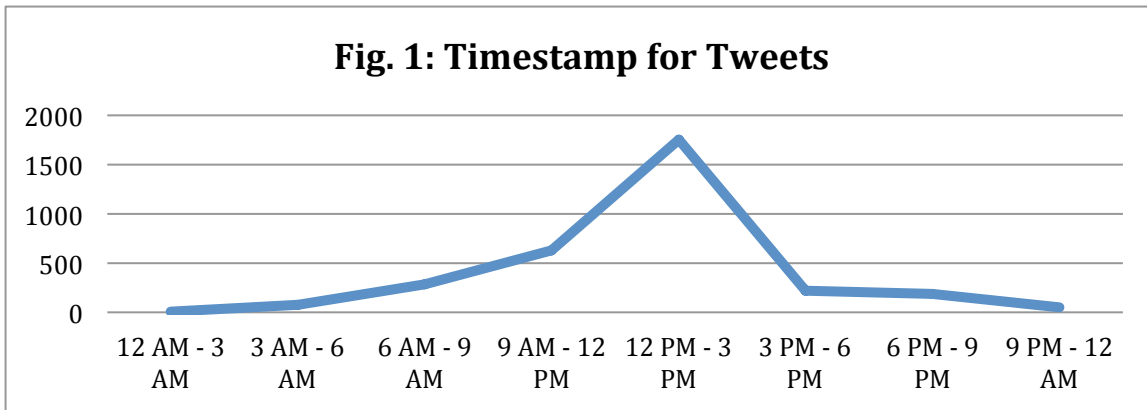
Chapter 3: Results

A total of 3,041 posts were coded from 10 non-profit and emergency management account holders during the time period from October 22 to November 7, 2012. Of those posts, 2,318 came from Twitter and 723 from Facebook.

In comparing the results from Facebook with the results from Twitter, three patterns emerged that are consistent across both the Red Cross and FEMA sponsored accounts. First, the use of hashtags is most prevalent on Twitter. Of the 2,318 tweets analyzed from both groups, 993 contained at least one of the five hashtags that were coded for. In comparison, only 4% of the Facebook posts contained one of those hashtags. Second, the limitations placed on the character count within the Twitter platform leaves the average tweet with 116 characters, while long-form posts on Facebook are unlimited in their character count, thus leaving the Facebook average at 304 characters. Finally, external web links were found in the majority of Facebook posts (65%), while a smaller percentage of the tweets contained links. Again, this could be explained by the differences between the formats of the two platforms and their accompanying character limits.

The predominant hashtag found in the posts surrounding Hurricane Sandy was #sandy, appearing in 43% of tweets and 4% of Facebook posts. One possible explanation for this occurrence is its length (6 characters) in comparison to some of the other hashtags that were coded for. The other hashtags coded for were: #hurricane, #HurricaneSandy, #SuperstormSandy, and #frankenstorm. Other hashtags appeared sporadically, but their presence was not significant enough to code for.

One shortfall in this research methodology is the inability to track the timestamp of Facebook posts. Because of this, there is an inability to accurately map and compare the time progression of Facebook posts. However, Fig. 1 shows the time map of tweets, which reveals peaks around early afternoon (12 pm – 3 pm) throughout the coding timeframe.



The theme of the posts was spread somewhat evenly across the 12 options that were coded for. The breakdown in Fig. 2 shows the split between Facebook and Twitter for each of the theme categories. Across the board, the three most popular themes (storm tips and general storm information, food and water resources, and non-storm related content) each gathered between 10 and 20 percent, with the volunteers and response coordination theme gaining the same amount on Facebook.

Figure 2: Themes Across Facebook and Twitter

	Facebook	Twitter	Total
Storm Tips/Information	91	458	556
Food/Water	119	398	518
Non-Storm Topics	121	318	440
Volunteers	105	189	294
Weather	76	185	291
Shelter	56	200	263
Transportation	47	156	205
Power/Gas	51	125	176
Personal	2	109	111
Safe & Well Lists	7	77	84
Fundraising	29	53	82
App Usage	18	49	67
Total	723	2318	3041

Most of the posts were original content, but of those that were reposted, a majority came from the smaller accounts (regional and local entities). Though this was not expressly coded for, coder observations reveal that many of the retweets by the smaller (local) accounts originated from their national counterparts.

User mentions across both platforms were rare and yielded unexpected results. The majority of user mentions were that of personal accounts rather than those of public figures. Only 347 tweets and 71 Facebook posts linked to other accounts, and of those, more than 35% were individual accounts. In correlation, those “personal” user mentions were most prevalent among posts coded as “personal” – meaning they were used to reply directly to individual users. On the other hand, the mentions of President Obama, Chris Christie, and Andrew Cuomo were used to make connections between the actions of those political figures in response to Hurricane Sandy and the accounts that generated the posts. Among

accounts related to storm response in New Jersey, Chris Christie had the highest percentage of user mentions.

Breakdown by Account

Each account's individual data shed light on how that particular organization used social media to respond to Hurricane Sandy. Appendix C contains the breakdown of each account's data separated by variable.

The data from the American Red Cross came primarily from its Twitter account (79%), with its postings peaking on October 29, the day Hurricane Sandy made landfall. This account yielded the highest average number of shares/retweets (373) and likes/favorites (444) of all the other accounts and relied on original content for a majority of its postings. Sticking with the overall trend, food and water availability and storm tips and general information made up over a third of the posts.

The account for the North Jersey region of the Red Cross yielded similar findings. With over 90% original posts, this account showed heavy usage of #sandy, which appeared 50 times over the course of the storm. Though the pacing of tweets was steady, there was a slight peak during November 1st, one of the starting days for recovery efforts.

Data for the South Jersey region of the Red Cross focused entirely on Twitter, with just over 100 tweets in the 17-day window. Nearly a third of the tweets involved personal responses to individual users. The same number of tweets also used #sandy, with 7% also including #hurricane. The breakdown for theme differed

slightly from the norm, with 20% of the tweets landing in the shelter and volunteer and response coordination categories.

The Red Cross of Greater New York had the opposite skew in data from the rest of the Red Cross affiliate accounts, as it focused entirely on Facebook posts. As was stated earlier, the account had too many tweets to track back to the time of Hurricane Sandy. With one of the highest average character counts (529), this account also boasted a high rate of original content. Also, more than half of the posted contained links, and almost as many had pictures or videos.

The Long Island outfit of the Red Cross was another account that surged in postings surrounding the onset of the storm (October 28/29), but then surged again a few days later on November 4th. Of the over 200 posts, a quarter of them included #sandy and around a third were reposted content. User mentions were rare, but were mostly made up of personal accounts. The majority of this account's posts included links (54%).

The Metro New York Red Cross was another account heavy with volunteer and response coordination-themed posts. A good portion of the posts (10%) contained videos and/or links to videos, which is higher than many of the other Twitter-dominated accounts. But this account had a lower average number of likes/favorites than the other accounts at just a little over 2.

The FEMA affiliated accounts, on the whole, yielded more data from a more even split between platforms (with the exception of FEMA Region 2, which does not have a Facebook account). The geographical areas these organizations serve are

more widespread, and thus the accounts generated more varied results than the location-specific Red Cross accounts.

The national FEMA account had a slow build up into storm time, but once the storm hit, the posts kept coming at a steady rate. Nearly half of the posts coming from this account used #sandy (184) and a majority of them also included a link to an external website. The average number of shares was near 200 and the average number of likes was close to 80.

The regional FEMA account was the only account to boast a good number of tweets in Spanish (21) and more than half of the tweets contained #sandy, but rarely did the account post images. It was also rare for the account to mention user account within the tweets, but when it did, more than half of the mentions were for individual users.

The emergency management organization for New Jersey (Ready NJ), generated nearly 900 posts split between Facebook and Twitter, more than any other account, but more than 60% of the account's content was reposted from other sources. This was the only account to use all 5 of the hashtags that were coded for, but #HurricaneSandy and #SuperstormSandy were only used a handful of times. This account also had more evenly distributed theme data, with the exception of application use and personal messages that made up less than 2% of the data combined.

And finally, the Notify NYC account (New York City's emergency management organization), was evenly split between Facebook and Twitter posts, with around

100 from each. More than any other account, Notify NYC focused on traffic alerts and other transportation information and had 87% original content in its postings.

This breakdown of individual account statistics is helpful in determining the effectiveness of each organizations approach to social media usage during a natural disaster like Hurricane Sandy. In the next chapter, these results will be analyzed and advice will be given for crisis response technicians involved with natural disasters in the future.

Chapter 4: Discussion, Recommendations, and Conclusion

With the data laid out quantitatively, it's now time to turn to how this information can be applied to gauge the effectiveness of each organization's social media usage during the storm and make recommendations for the future.

Observations

There were a number of observations that the coders made while conducting the research that were not included in the analysis, but that may be important in getting the full picture of the data. First, the same exact content was repeated and slightly altered both within and in-between accounts. For instance, the same structure would be present in each tweet giving the location of food and water. Similarly, accounts within the same (Red Cross or FEMA) sphere would tweet or post the exact same content without evidence of a retweets/share. This could possibly hint at inter-organization communication, or it could just mean that they are copying and pasting the messages without giving credit to the original source. Further research through in-depth interviews might help to shed light on these interactions.

Secondly, a pattern emerged with location-based hashtags that was not coded for. #NJSandy and #NYSandy were both used endlessly by the organizations to distinguish response efforts impacting different geographic areas. In addition to this, #NJ, #NY, and #NYC were also common.

Though there were very few posts that featured content in a language other than English, it is important to note that FEMA was utilizing a Spanish account to provide an alternative for Spanish-speaking citizens during the time of the storm.

This account was not included in the study and thus the research may be skewed against the amount of disaster response content available in Spanish at the time of the storm.

And finally, a lot of interaction was going on between the organizations and members of the community outside what was coded for. On Facebook, the posts were filled with comments and responses from these groups and on Twitter messages and tweets were exchanged back and forth. There is some evidence of this within the data under the scope of “personal” themed tweets and individual user mentions, but this only shows a small part of the conversation that was going on between these groups and the community during the timeframe of the storm.

Fig. 3: Personal Twitter Exchange

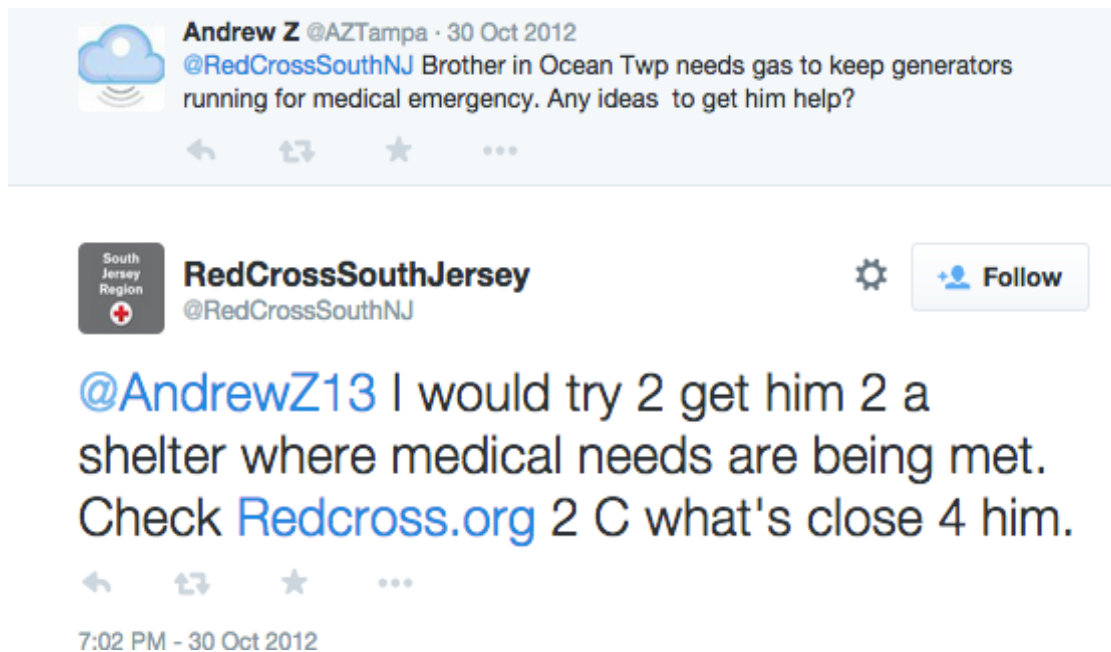


Fig. 3 shows an example of a Twitter exchange between an individual user and the Red Cross – South Jersey Region account. This serves as an example of what was coded as “personal”-themed and it also contains a personal user mention. Some

of the accounts are riddled with these types of exchanges, while others ignore the two-way nature of communication on social media.

With these observations and the quantifiable data in mind, turn back to the original research questions.

RQ 1: How are crisis communicators currently employing social media in their response to natural disasters?

As evidenced by a well-balanced spread of themes, organizations are using social media platforms during natural disasters to spread a variety of different messages. They are informing the communities on ways to stay safe before, during, and after storms, and keeping them updated on weather conditions and the locations of shelters and places where they can go to get food and water. They are also acting as a go-between for power companies and transit authorities, as well as guiding the community to the correct resources to let their family members know that they're safe, and promoting doing these activities through their web and mobile-based applications. Furthermore, they are raising funds for the relief efforts and coordinating response efforts across large geographical areas. And finally, they are interacting with people on a personal level, giving them assurance during a time of crisis, while still continuing on with the everyday functions of their organization, like running blood drives for the Red Cross.

RQ 2: How does an organization adapt its message between different social media platforms?

This is a question more of form than of function. As the data show, both Facebook and Twitter accounts shared the same messages, but some platforms are

more adept at spreading certain kinds of content. Videos, for instance, are easier to view on Facebook because of the nature of the platform, whereas short, sporadic bits of text fit in with the pace of Twitter. Essentially a lot of the same information was shared on both platforms, but for the parts that required a more text-heavy explanation, users on Twitter were directed to links instead of having the content dispersed between a number of short posts. In contrast, Twitter offered a summary version of some of the more long-form posts found on Facebook.

Best Practices Moving Forward

A quick response in times of crisis is vital to a technologically dependent society for a variety of reasons. First, people in this day-and-age expect things NOW. But also, in a disaster like this with power outages and people relying on the Internet or their cellphones, time is limited before their batteries die. Mobilizing a response quickly and having preparations made ahead of time will speed up access to aid and help in recovering from natural disasters. I recommend that in the future, disaster response accounts begin posting helpful information about storm resources in the days leading up to the storm. Front-loading content in this way will help to counteract the potential impact of power outages on response efforts. In the context of Hurricane Sandy, weather forecasts predicted the storm's magnified impact as early as October 22nd, yet many accounts held off from posting a majority of their preparation content until just before the storm arrived on October 28th or 29th. Pushing forward with this knowledge, practitioners of disaster response can spread content ahead of time, providing valuable resources (like preparation guides and

instructions on how to contact local first responders) that have the potential to save lives.

Another trend that was shown in the coders' observations of the research was that many organizations reached out to the community to crowd-source their efforts. On one side, community members were letting the response organizations know what areas were in dire need of aid, and people could help one another by posting pictures and locations of resources like food and water stations. On the other hand, this was also a way that organizations could grow support and manpower in the form of financial contributions and volunteers who reached out through social media. However, there still remains a disconnect between many of the disaster response accounts and the communities they serve.

Social media is dialogic in nature, yet many of the accounts failed to utilize two-way conversations with members of the community. Occasionally this was seen in the accounts that relayed personal messages to individual users, but the overall response could have been much more successful from this perspective. Perhaps a lack of manpower or an overabundance of questions posed to these accounts during the timeframe of the storm made personal responses infeasible. However, I have some recommendations for enhancing this communication method in the future. First, accounts that request users retweet or respond to their postings with locations of aid (food and water) should retweet the images that they receive. This will make the information more accessible to users in the area, rather than forcing them to look back through streams of comments coming into the main accounts. It takes much more effort to look up an individual user's response than to look

through an organization's feed. Second, organizations should hire or secure more volunteers to provide individual assistance through social media. While phone lines may become busy during a storm, the power of the Internet allows users to ask questions and get immediate responses, as long as someone is there to respond. This could also be used to relay information to first responders when emergency services cannot be reached by phone.

Effectiveness in the Hierarchy

The criteria used to gauge the effectiveness of a message put out by either organization will differ based on the size of the target audience. As the targeted areas become larger, the threshold for effectiveness increases. While the national organizations may have been getting hundreds of likes/favorites per post, they are reaching thousands, if not tens of thousands of people. Smaller accounts get less response because they have a smaller audience. The middle ground is where the most effective level of management arises in a situation like Hurricane Sandy. It allows the message to be crafted in a more localized fashion, while at the same time having the draw of a large audience with which to share important information. In the case of a natural disaster like this one, a state-centric organization might be most effective in the future, with employees or volunteers dedicated to giving community members a personalized response to their concerns and useful information that can direct them to accessible resources in their area.

Further Research

There were many accounts that did not make the cut for this research study because there would have been an enormous amount of data to comb through, but

this provides ample opportunities for further research. Expanding both the geographical scope and the timeframe of the study could lend new findings from the data. Additionally, another tier or two could be found in the hierarchical structure of emergency management organizations. Though unverifiable by the means that were used in this study, individual users representing the Red Cross (their employees, for example) could be used as a source of data. Further, many counties have their own emergency management organizations that deal with individuals in need of assistance more directly than those chosen for the purposes of this study.

Further subdivision of the “theme” category could also give even greater distinction to the effective use of social media and lend more exact advice for crisis managers in the future. For instance, dividing up the “storm tips and general storm information” category into separate segments for storm preparation and how to get assistance (among others) would be a helpful enhancement on the research done here.

Interviews or conversations with people who work on social media for these accounts would be beneficial in gaining insight into the stream of communication within and between disaster response agencies. Knowledge of the constraints put on these practitioners in time of crisis would be helpful in crafting new strategies for their incorporation of social media as tool during disaster response.

Conclusion

Social media offers practitioners of disaster response an inherently interactive format to coordinate response efforts with the communities that they serve. This analysis of Red Cross and FEMA accounts across Twitter and Facebook

has revealed a widespread failure to utilize the dialogic nature of social media. Incorporating a more personalized approach from local accounts will aid citizens in receiving swift responses and will help link them to the aid they need. The best practices outlined in this chapter serve as a starting point for the ongoing conversation on the adaptation of crisis management techniques to an evolving media landscape.

Appendices

Appendix A: Account Profiles

American Red Cross
@RedCross
of followers: 2.13 M
Active since: June 2007
of posts during Sandy: 168
facebook.com/redcross
of followers: 651,283
Active since: 2008
of posts during Sandy: 44

Red Cross – North Jersey Region
@RedCrossNorthNJ
of followers: 3,910
Active since: September 2012
of posts during Sandy: 147
facebook.com/AmericanRedCrossNorthJerseyRegion
of followers: 1,622
Active since: 2012
of posts during Sandy: 48

Red Cross – South Jersey Region
@RedCrossSouthNJ
of followers: 1,034
Active since: October 2012
of posts during Sandy: 107

Red Cross – Greater New York
facebook.com/redcrossny
of followers: 42,072
Active since: 2007
of posts during Sandy: 107

Red Cross - Long Island
@LIRedCross
of followers: 5,917
Active since: March 2009
of posts during Sandy: 141
facebook.com/LIRedCross
of followers: 1,707
Active since: 2010
of posts during Sandy: 62

Red Cross - Metro New York
@RedCrossMetroN
of followers: 2,453
Active since: July 2009
of posts during Sandy: 92
facebook.com/metronorthredcross
of followers: 671
Active since: 2011
of posts during Sandy: 46

FEMA
@FEMA
of followers: 389K
Active since: October 2008
of posts during Sandy: 363
facebook.com/FEMA
of followers: 216,338
Active since: 2009
of posts during Sandy: 68

FEMA Region 2
@FEMARegion2
of followers: 17.7K
Active since: December 2008
of posts during Sandy: 536

Ready NJ
@ReadyNJ
of followers: 26.8K
Active since: February 2009
of posts during Sandy: 658
facebook.com/READYNEWJERSEY
of followers: 90,620
Active since: 2010
of posts during Sandy: 230

Notify NYC
@NotifyNYC
of followers: 135K
Active since: September 2008
of posts during Sandy: 103
facebook.com/nycemergencymanagement
of followers: 32,515
Active since: 2007
of posts during Sandy: 108

Appendix B: Code Book

1. Name of Account

Select which account the post is from:

- American Red Cross
- Red Cross – North NJ Region
- Red Cross – South NJ Region
- Red Cross – Greater New York
- Red Cross – Long Island
- Red Cross – Metro New York
- FEMA
- FEMA Region 2
- Ready NJ
- Notify NYC

2. Platform

Select which platform the post is from:

- Facebook
- Twitter

3. Date

Written in the format DD/MM; all posts are from 2012

4. Time

Written in the format HH:MM; distinguish AM or PM

5. Language

Select which language the post is written in

- English
- Spanish
- Other

6. Number of characters

Calculated by pasting content into lettercount.com

7. Number of Shares/Retweets

Use the number that is located on the original post

8. Number of Likes/Favorites

Use the number that is located on the original post

9. Source

Select the source of the post:

- Original content
- Reposted content

10. Theme

Select the dominant theme from the following descriptions

- 1: Storm tips and general storm information
Posts regarding storm preparation tips, what to do during a storm, applying for storm assistance, recovery tips, general storm information, rumor control
- 2: Weather
Posts updating the weather forecast (rain, flooding, etc.)
- 3: Shelter
Posts giving the location of shelters and warming centers
- 4: Food and water
Posts giving the locations of food, water, and ice distribution
- 5: Power and gas
Posts with information about power outages and fuel resources/gas stations with availability
- 6: Transportation
Posts regarding traffic conditions and public transit closures
- 7: Safe and Well Lists
Posts about ways to let family members know you're safe after a storm
- 8: App Use
Posts that encourage the use of an organization's app
- 9: Fundraising
Posts regarding raising donations and benefit concerts
- 10: Volunteers and response coordination
Posts regarding response efforts, volunteer coordination, state and government employees, FEMA workers, response efforts in general, and the actions of first responders

11: Personal

Posts including direct conversations with individual accounts

12: Non-storm related functions of the organization

Posts that don't have to do with Hurricane Sandy

11. Image

Code for the presence of an image

- No
- Yes
- Multiple
- Video

12. External web link

Code for the presence of a link

- No
- Yes

13. Hashtags

Code for the presence of each hashtag

- #sandy
- #hurricane
- #HurricaneSandy
- #SuperstormSandy
- #frankenstorm

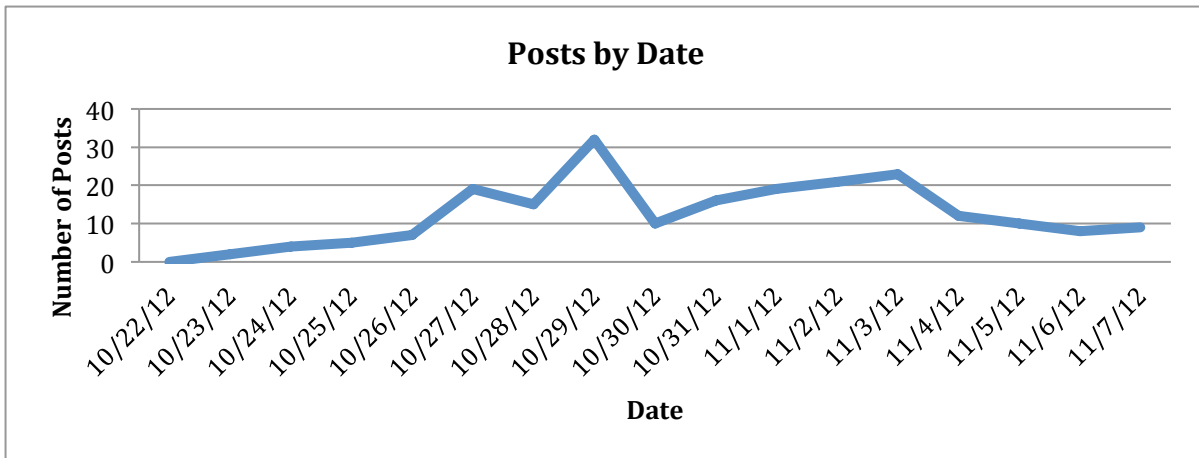
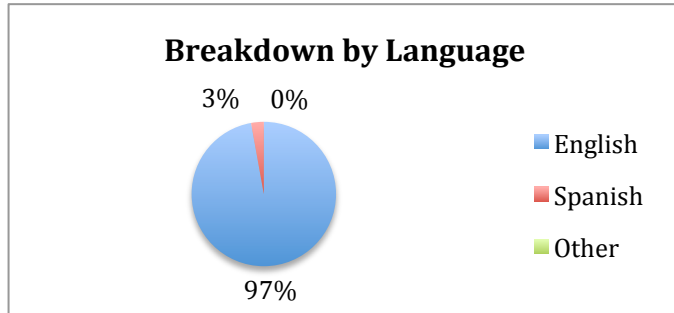
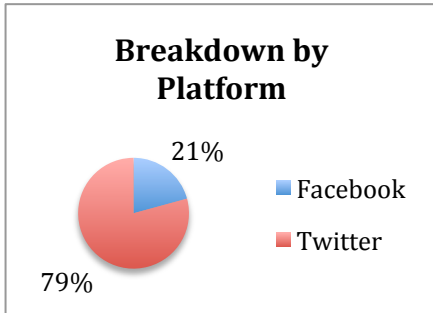
14. User mentions

Code for the presence of user mentions

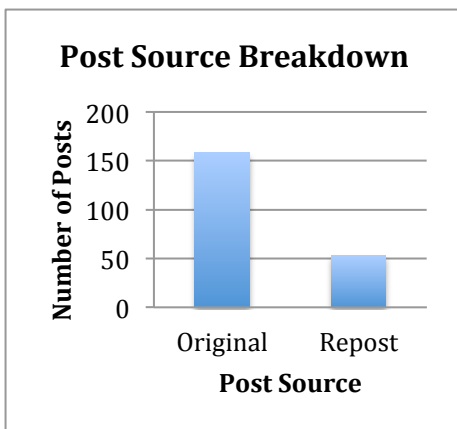
- President Obama
- White House
- Chris Christie
- Andrew Cuomo
- Personal Account

Appendix C: Individual Account Data

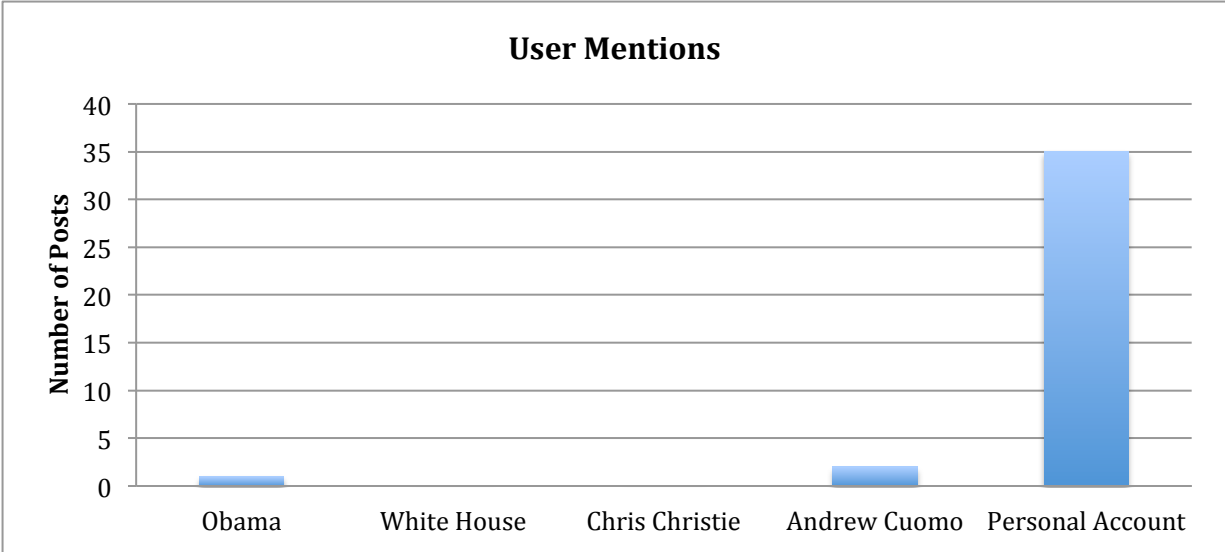
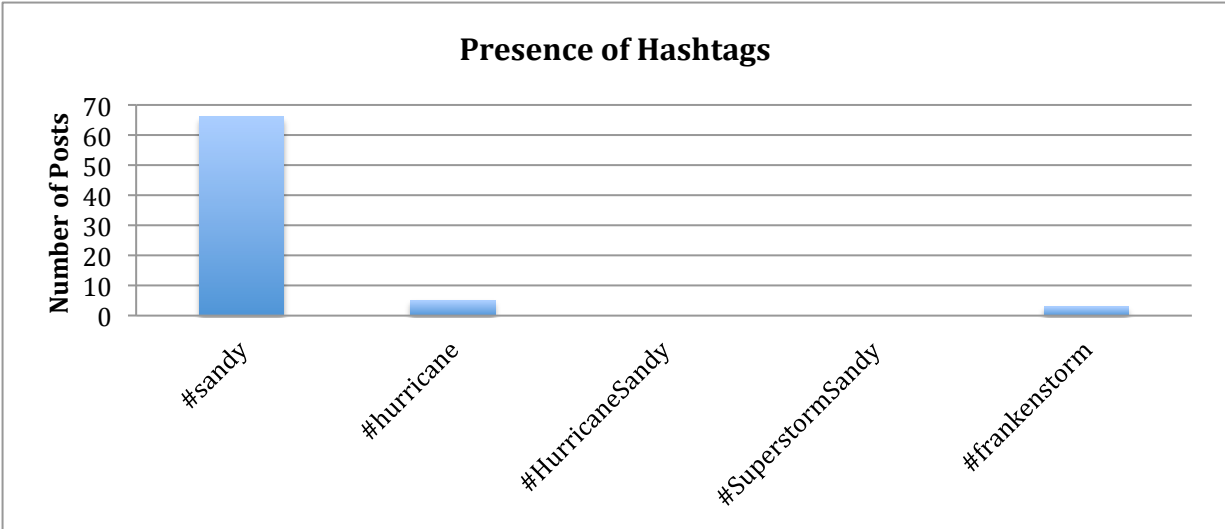
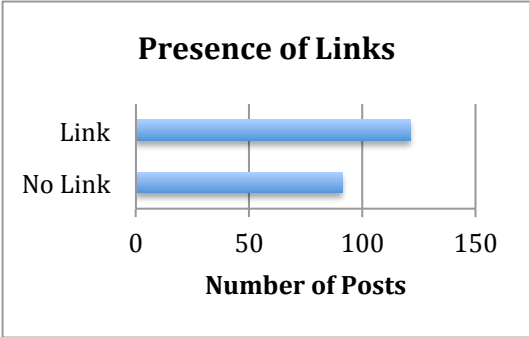
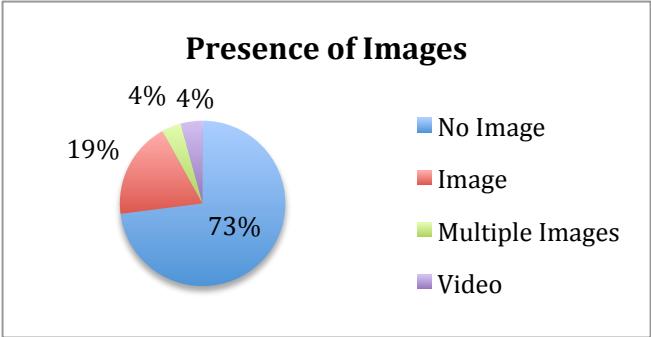
American Red Cross



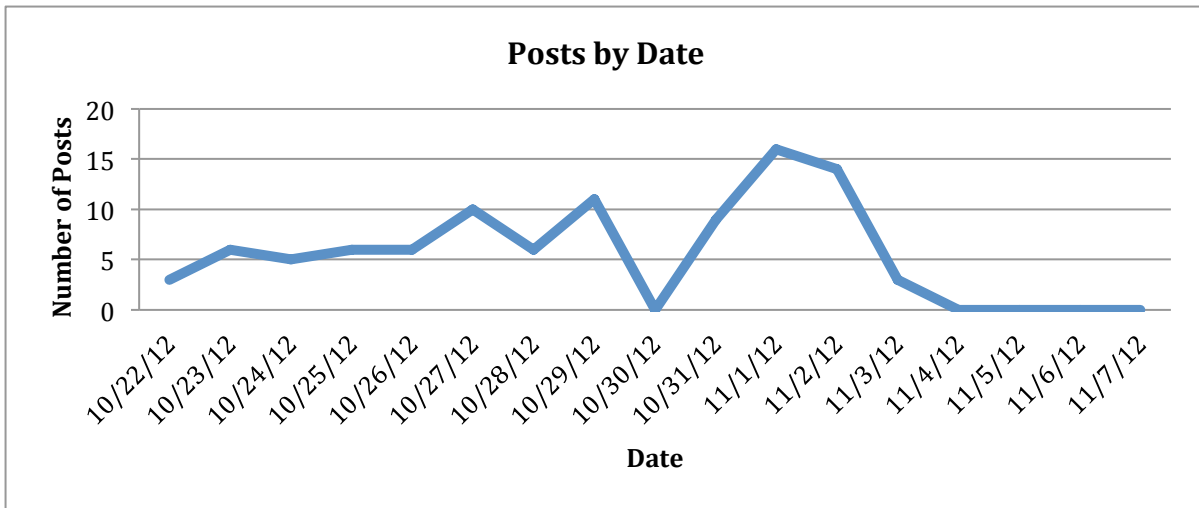
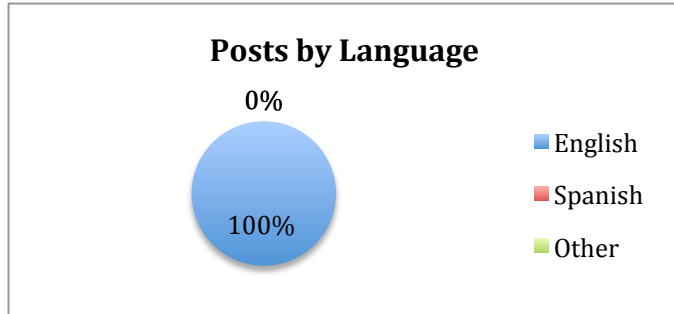
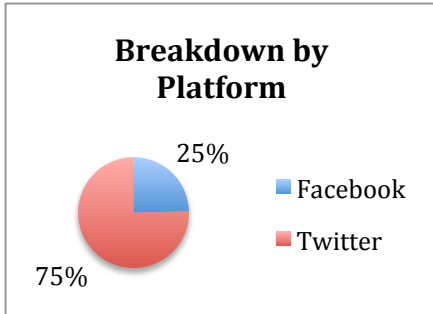
Averages	
Average # of Characters	154.27
Average # of Shares/Retweets	373.22
Average # of Likes/Favorites	444.09



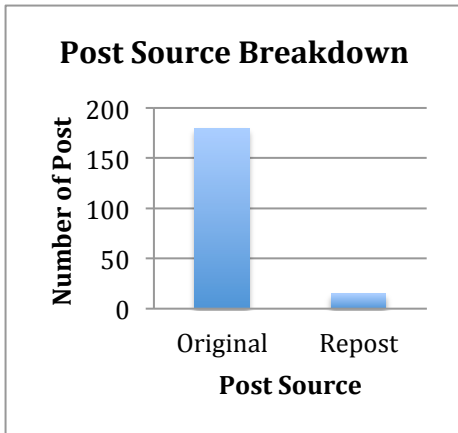
Theme	
1 = 35 (17%)	7 = 3 (1%)
2 = 8 (4%)	8 = 11 (5%)
3 = 25 (12%)	9 = 13 (6%)
4 = 51 (24%)	10 = 21 (10%)
5 = 2 (1%)	11 = 28 (13%)
6 = 0	12 = 15 (7%)



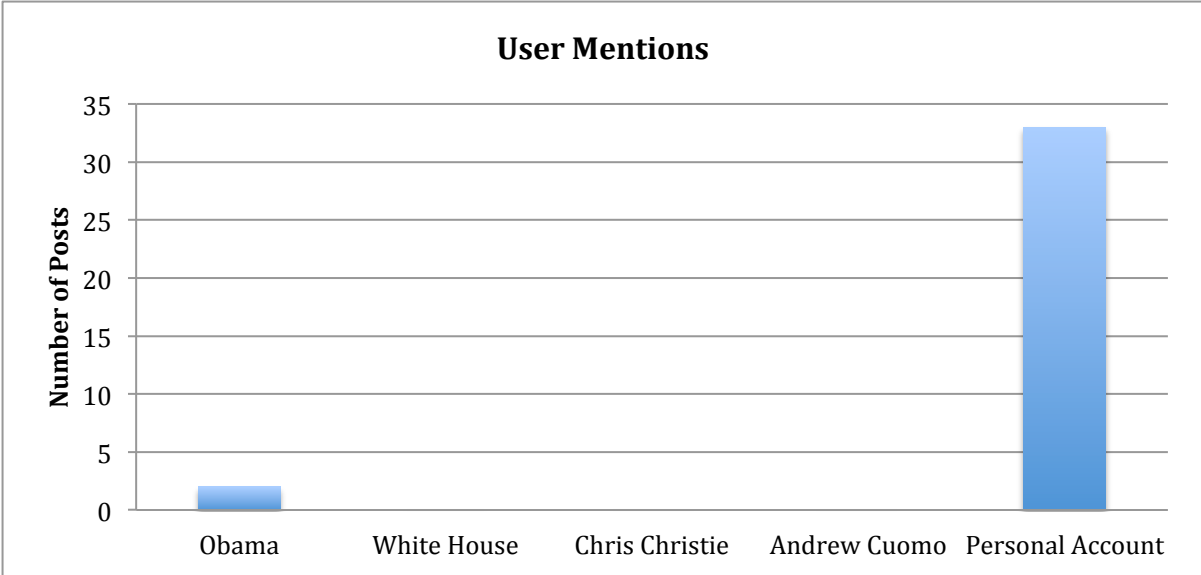
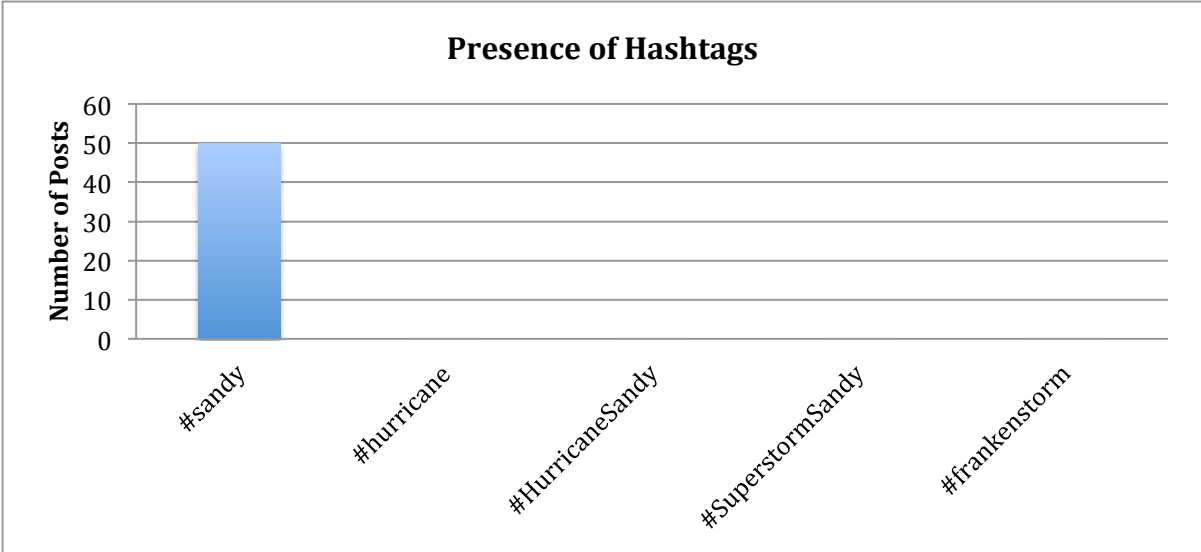
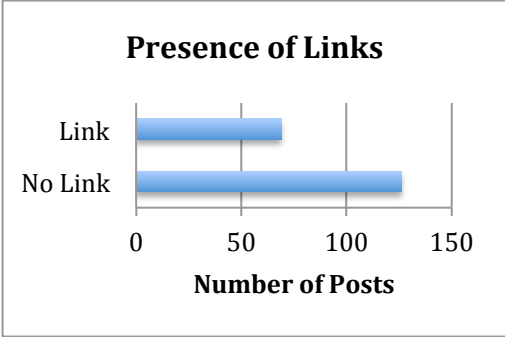
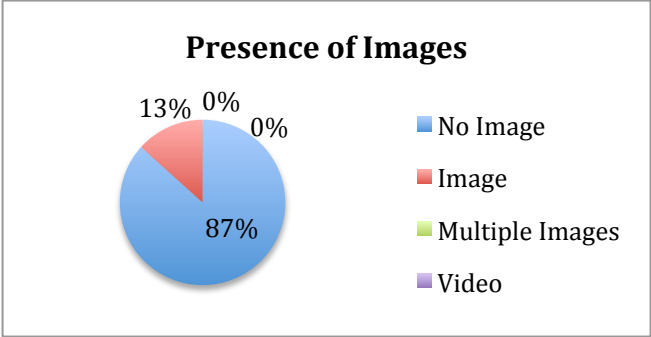
Red Cross – North Jersey Region



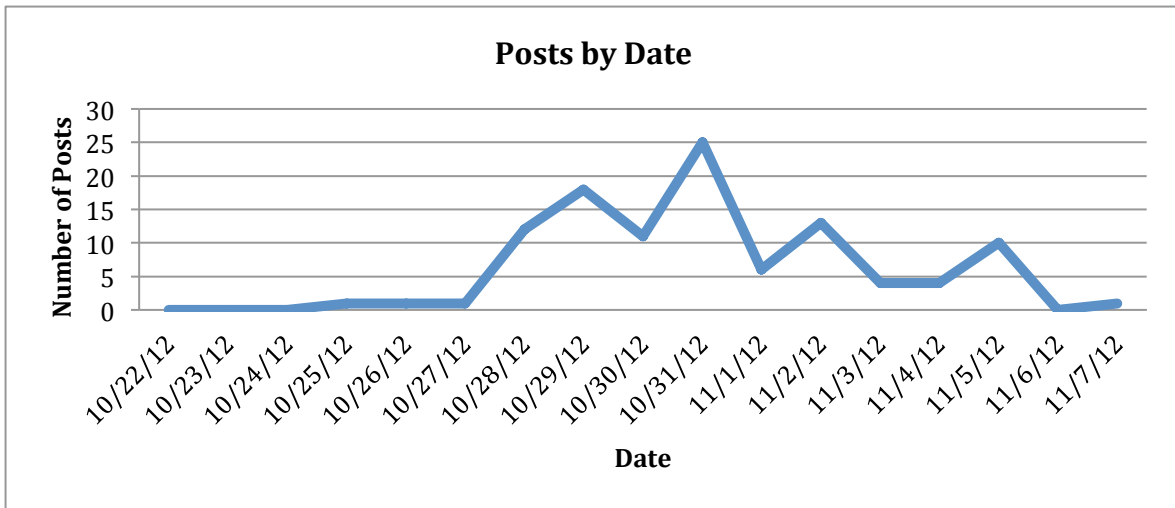
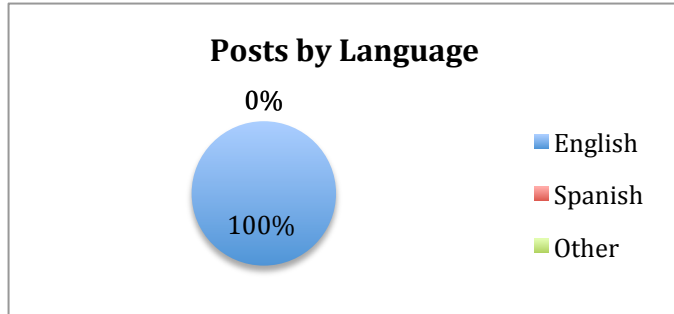
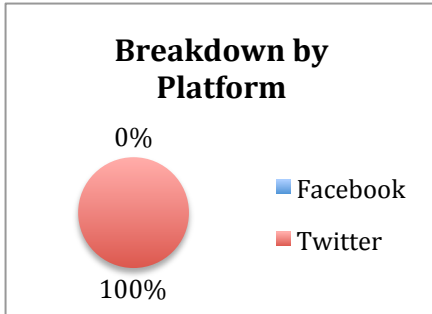
Averages	
Average # of Characters	101.78
Average # of Shares/Retweets	11.23
Average # of Likes/Favorites	2.09



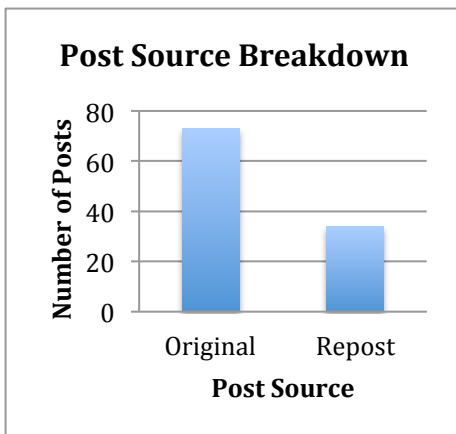
Theme	
1 = 35 (18%)	7 = 1 (1%)
2 = 5 (3%)	8 = 6 (3%)
3 = 23 (12%)	9 = 8 (4%)
4 = 60 (31%)	10 = 8 (4%)
5 = 28 (4%)	11 = 17 (9%)
6 = 0	12 = 24 (12%)



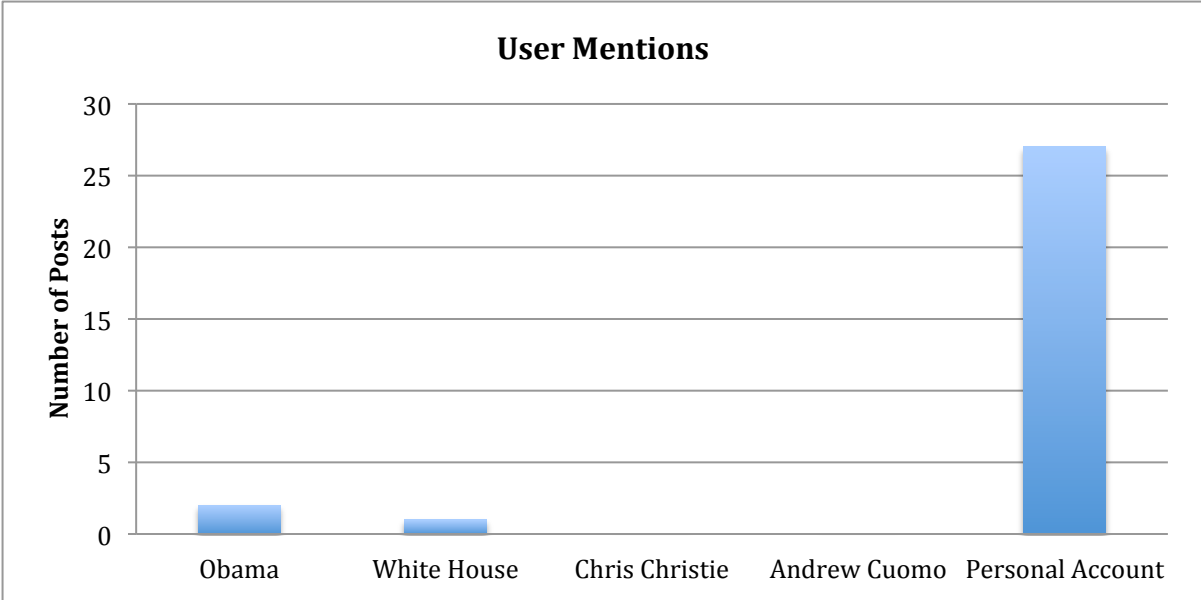
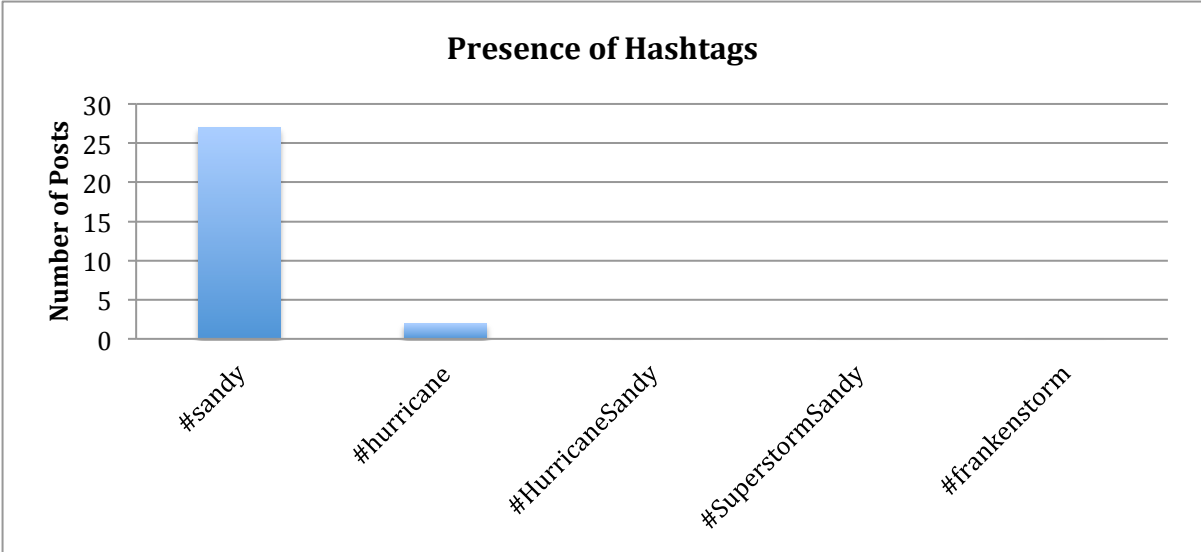
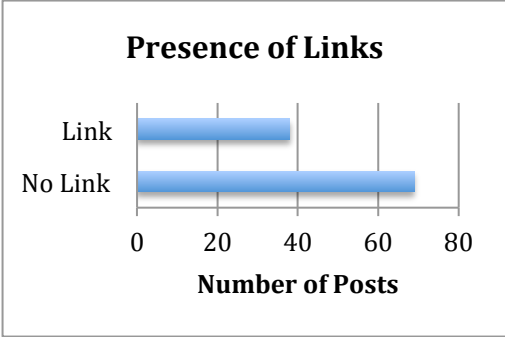
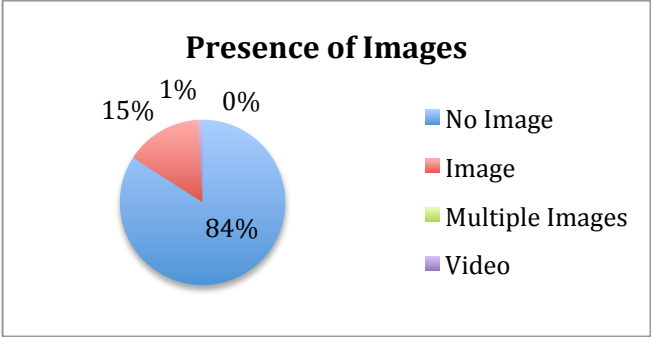
Red Cross – South Jersey Region



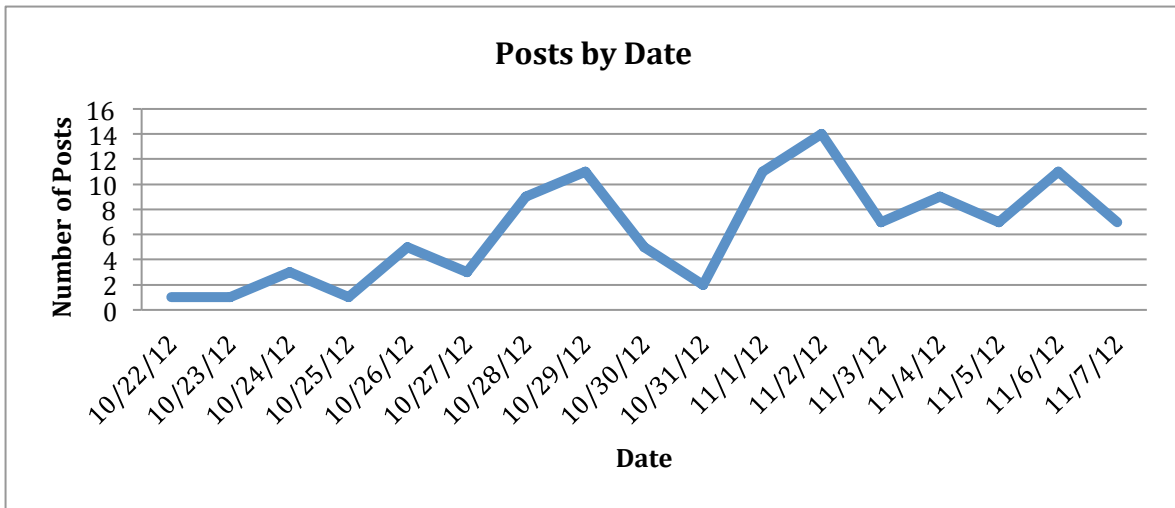
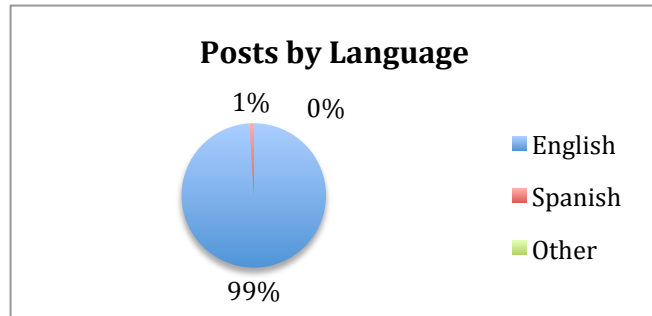
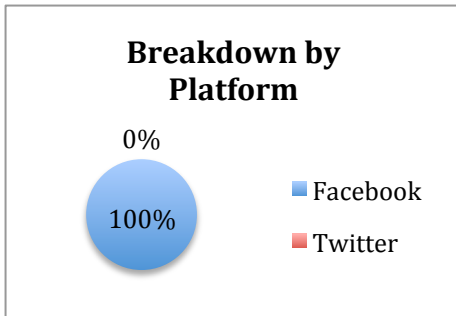
Averages	
Average # of Characters	114.77
Average # of Shares/Retweets	73.99
Average # of Likes/Favorites	7.54



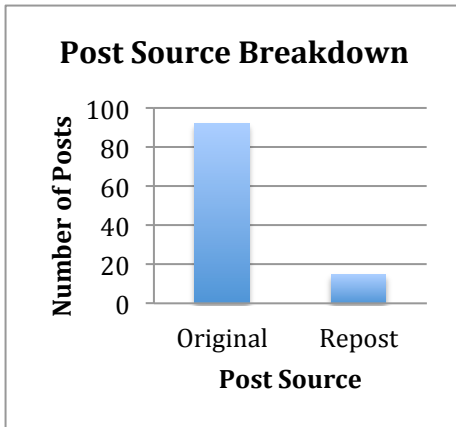
Theme	
1 = 16 (15%)	7 = 3 (3%)
2 = 2 (2%)	8 = 5 (5%)
3 = 21 (20%)	9 = 6 (6%)
4 = 12 (11%)	10 = 21 (20%)
5 = 0	11 = 14 (13%)
6 = 0	12 = 7 (7%)



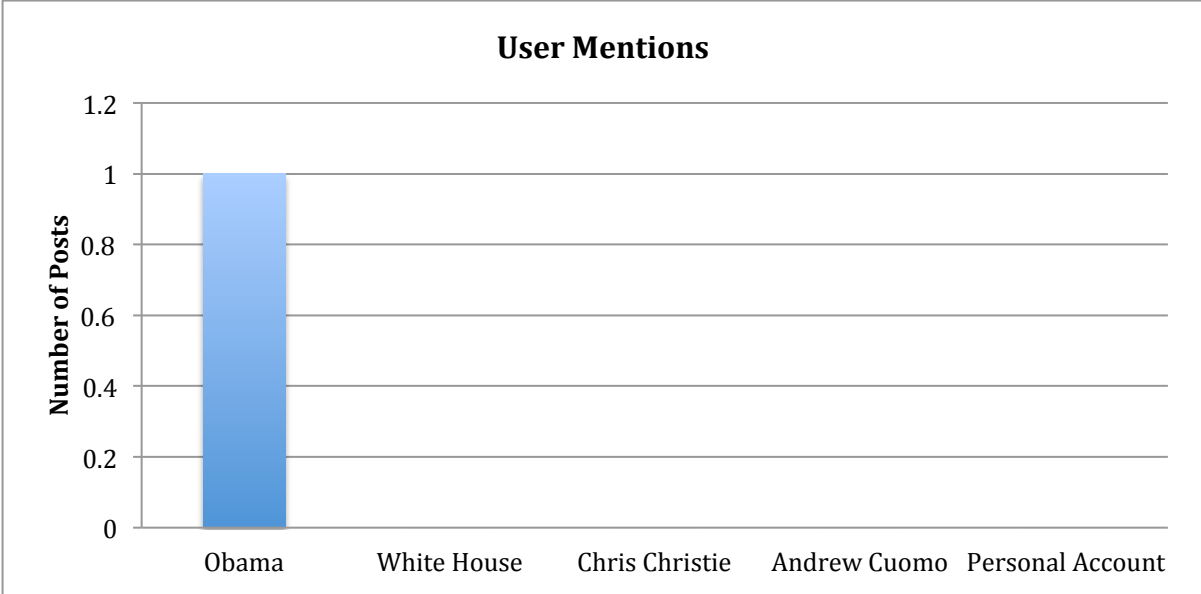
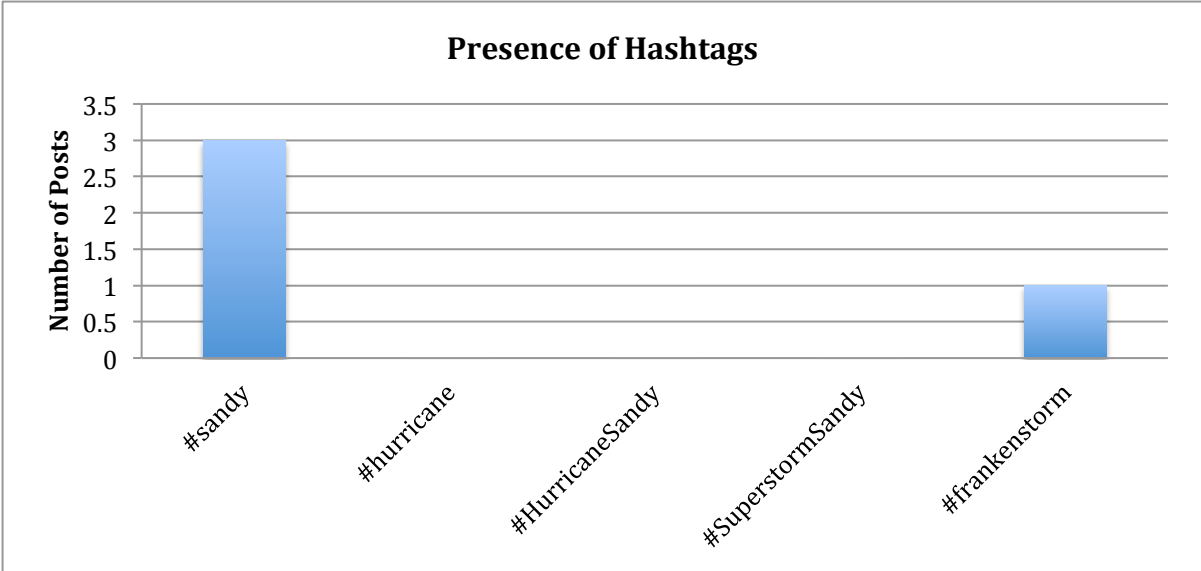
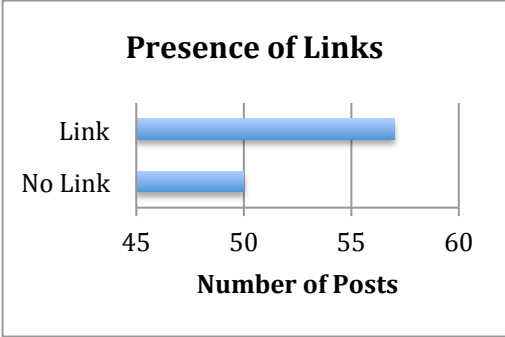
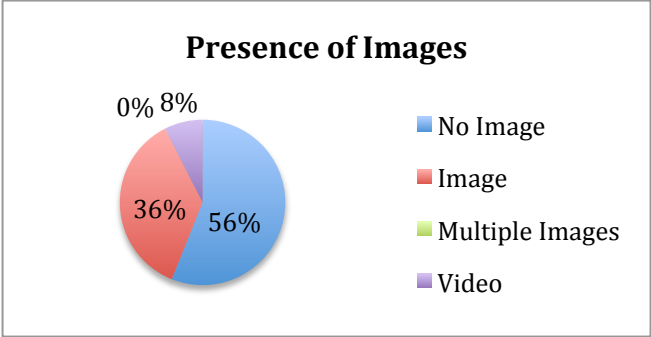
Red Cross - Greater New York



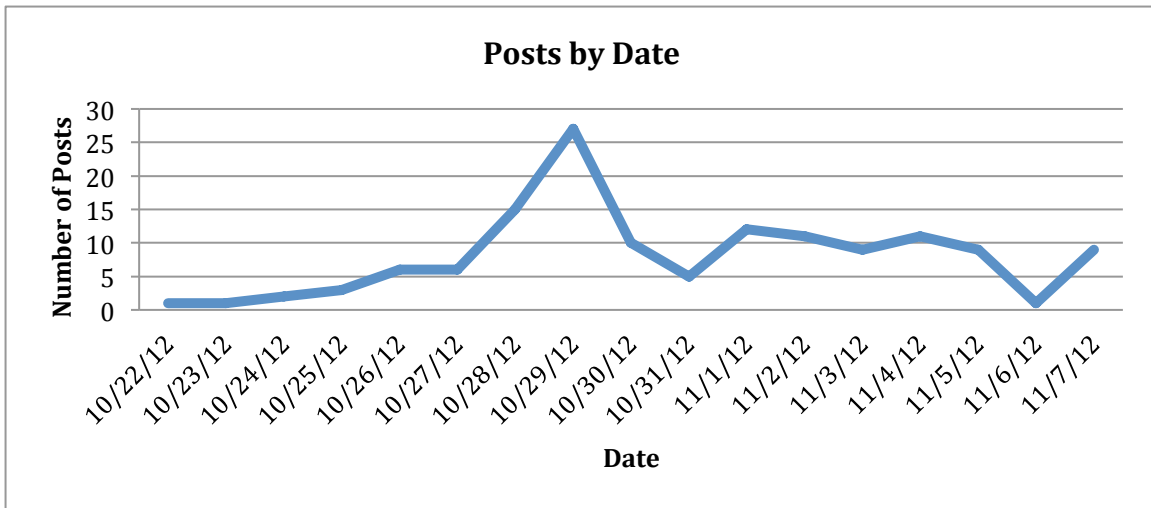
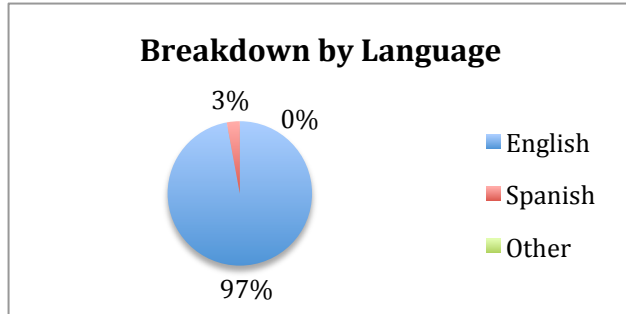
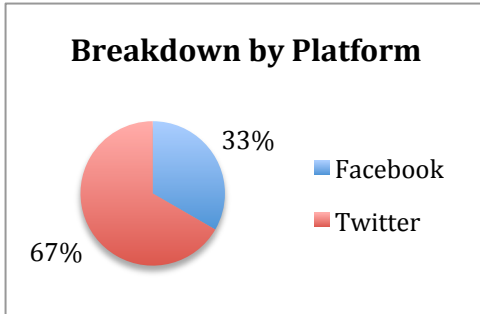
Averages	
Average # of Characters	529.29
Average # of Shares/Retweets	42.44
Average # of Likes/Favorites	328.17



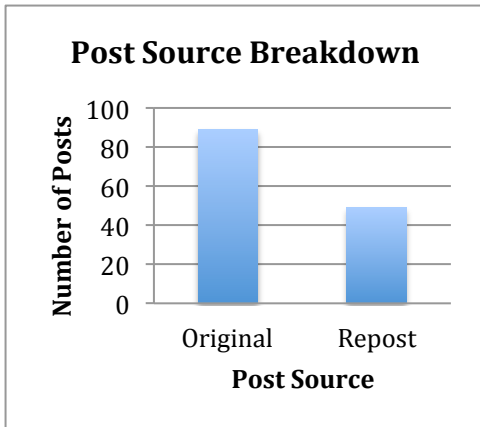
Theme	
1 = 14 (13%)	7 = 2 (2%)
2 = 4 (4%)	8 = 4 (4%)
3 = 5 (5%)	9 = 8 (7%)
4 = 41 (38%)	10 = 25 (23%)
5 = 1 (1%)	11 = 1 (1%)
6 = 0	12 = 2 (2%)



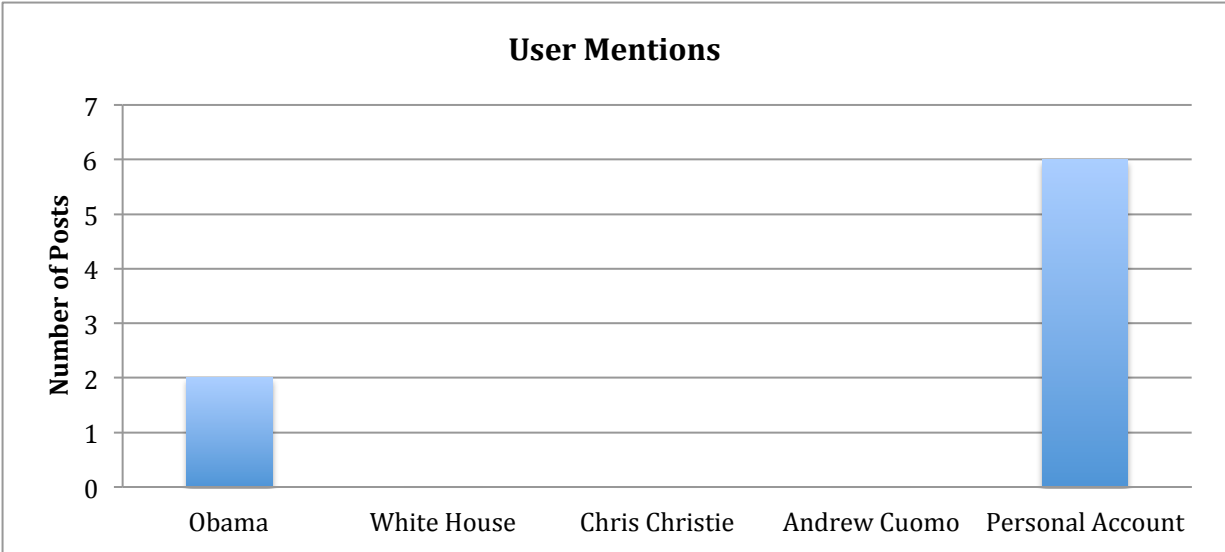
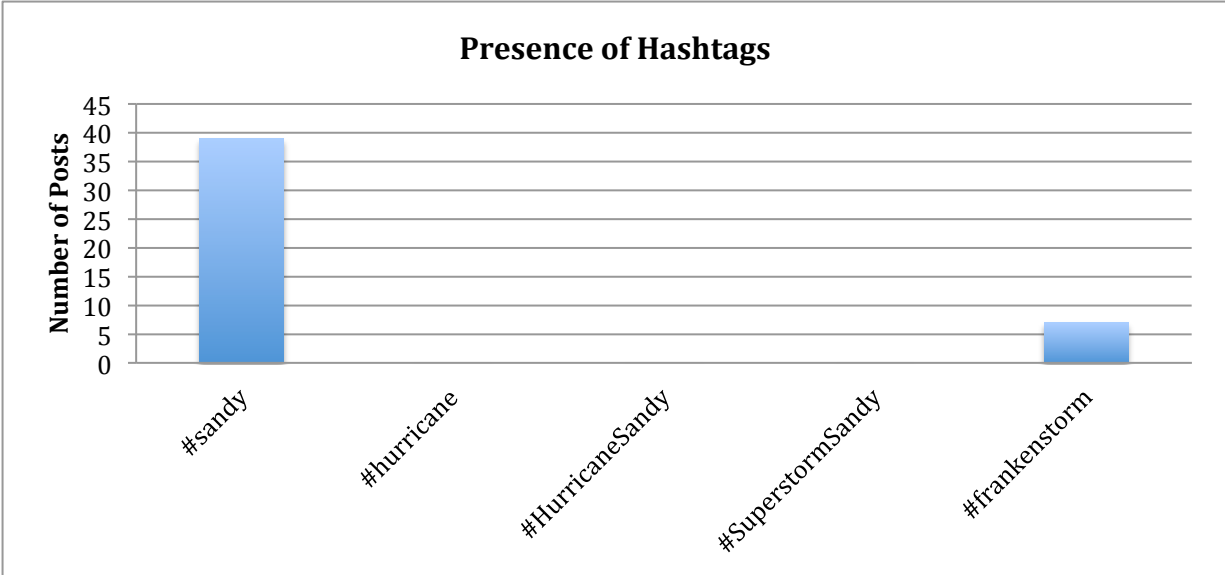
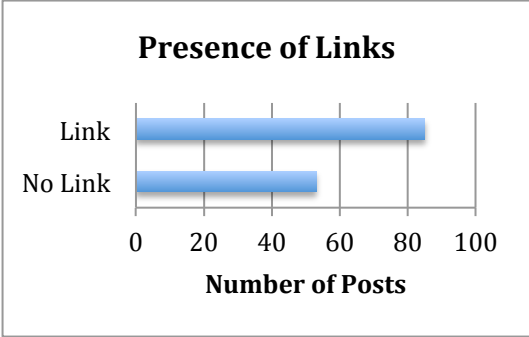
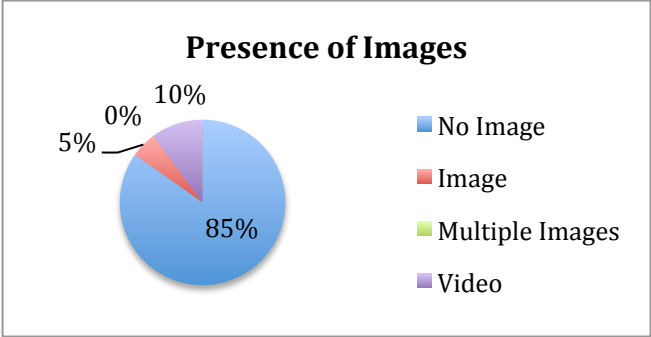
Red Cross - Metro New York



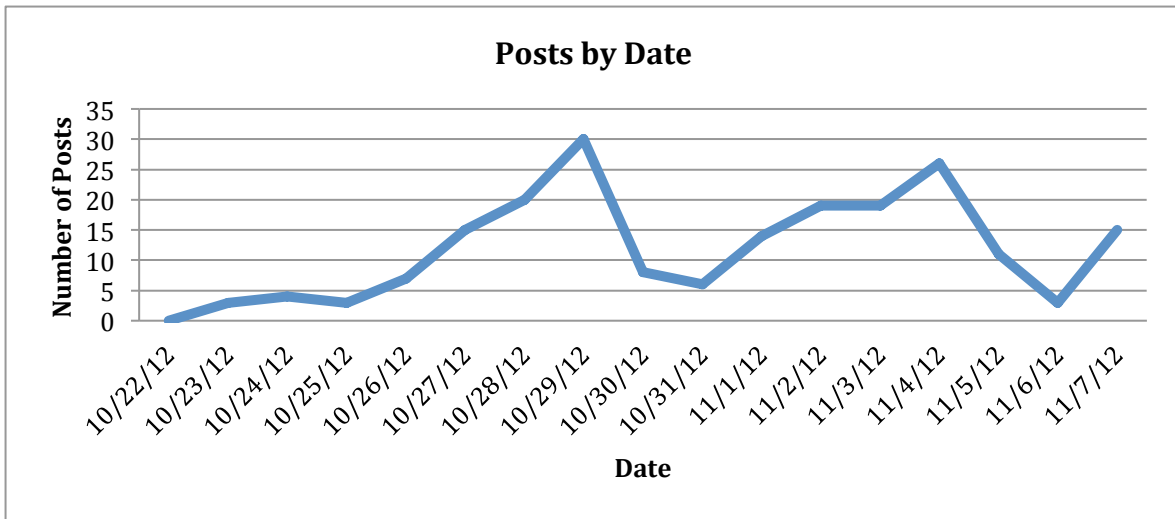
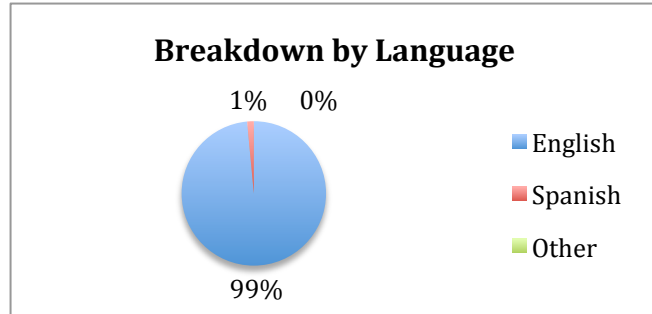
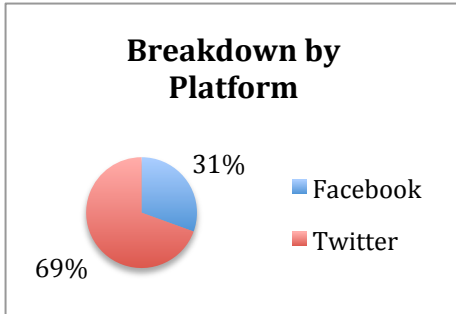
Averages	
Average # of Characters	116.16
Average # of Shares/Retweets	10.79
Average # of Likes/Favorites	2.05



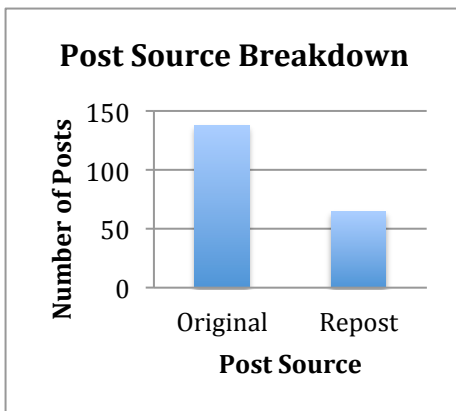
Theme	
1 = 31 (22%)	7 = 6 (4%)
2 = 3 (0%)	8 = 7 (5%)
3 = 8 (6%)	9 = 6 (4%)
4 = 31 (22%)	10 = 40 (29%)
5 = 2 (1%)	11 = 4 (3%)
6 = 0	12 = 0



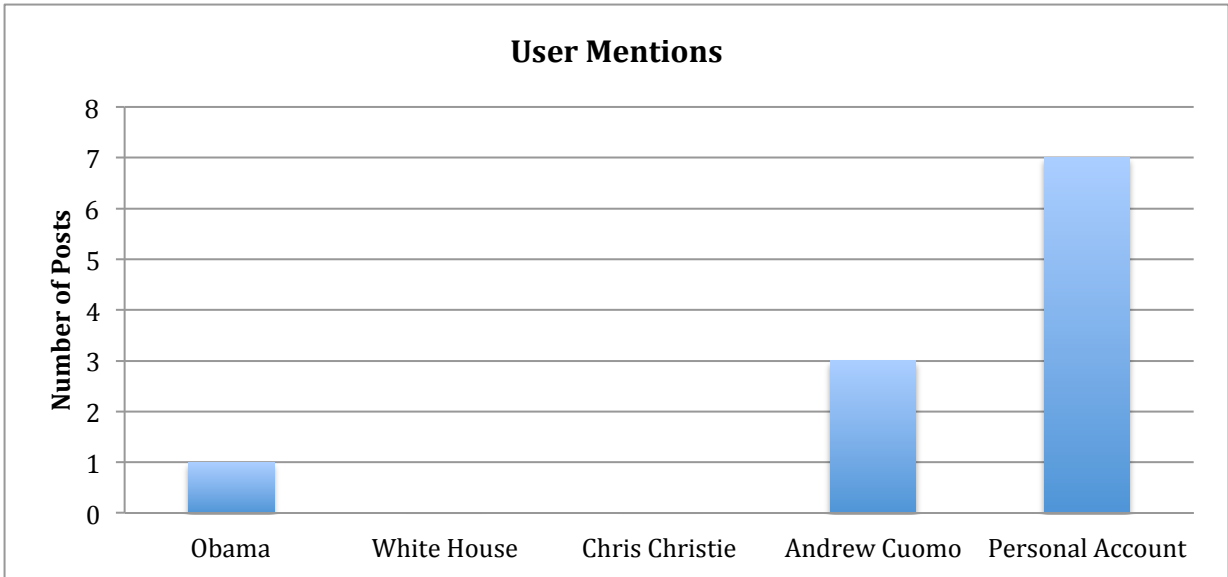
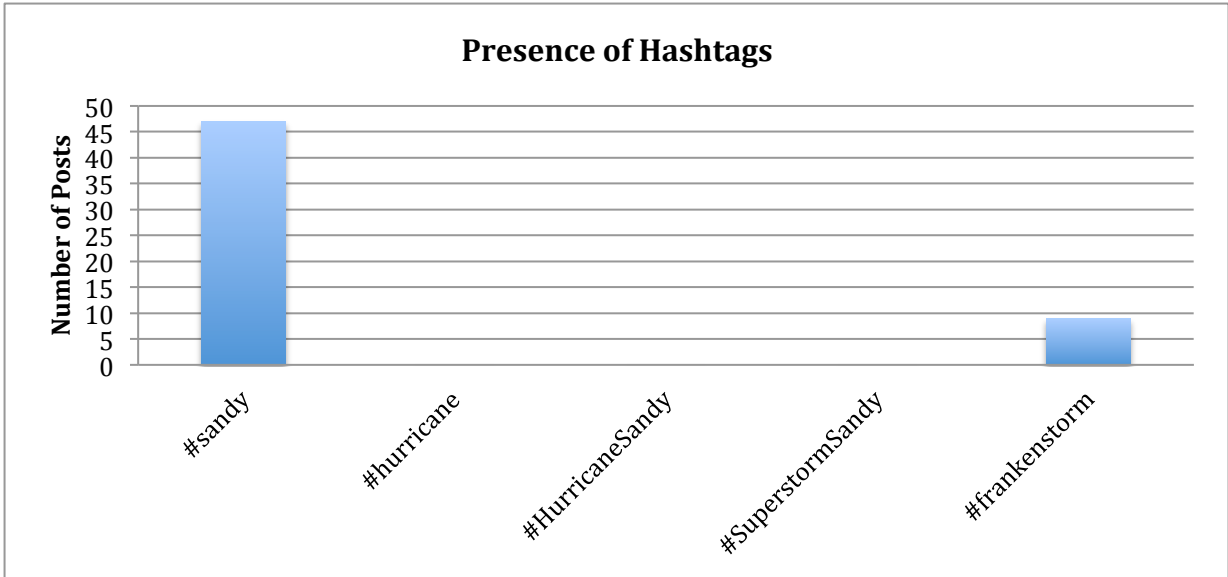
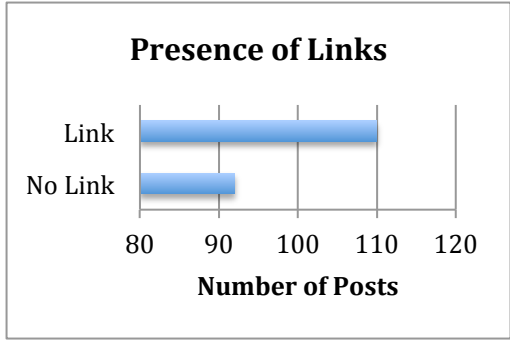
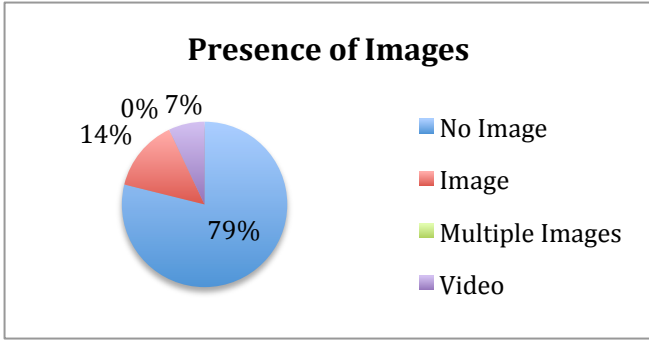
Red Cross – Long Island



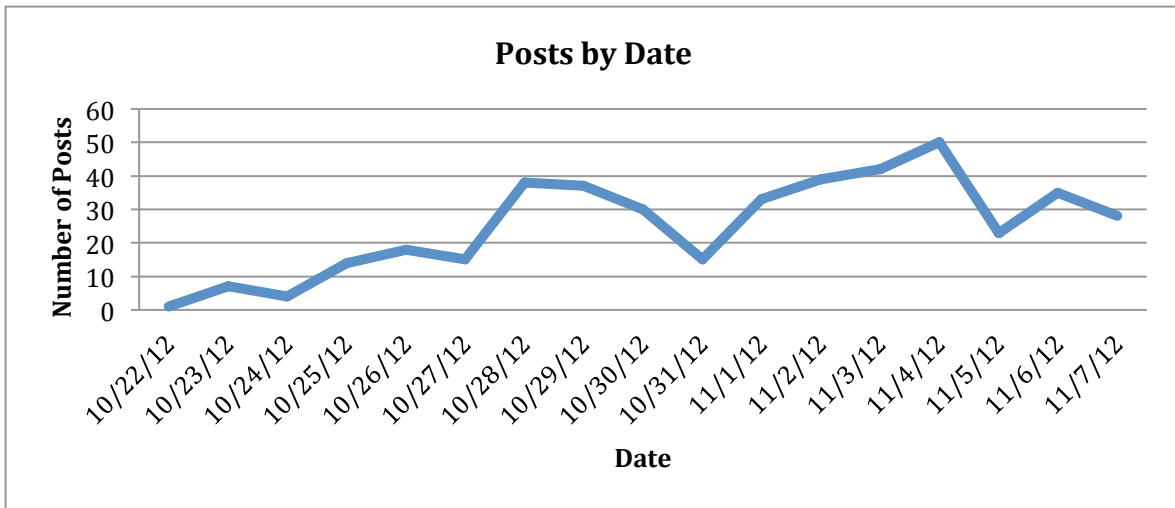
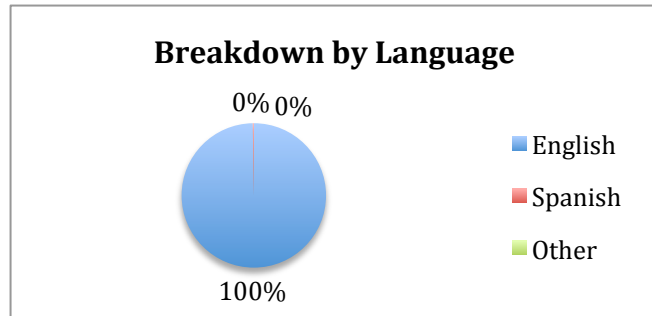
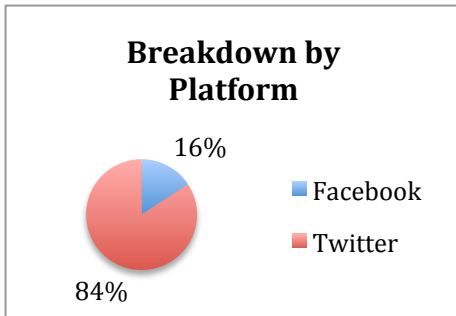
Averages	
Average # of Characters	120.63
Average # of Shares/Retweets	11.49
Average # of Likes/Favorites	4.15



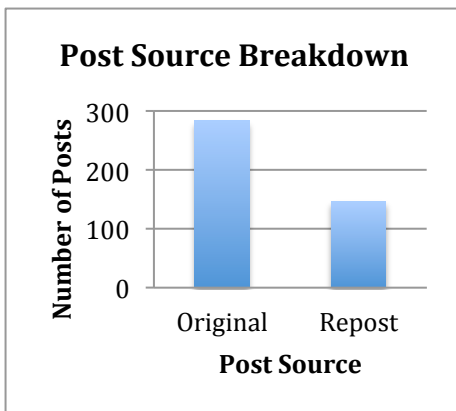
Theme	
1 = 33 (16%)	7 = 6 (3%)
2 = 8 (4%)	8 = 10 (5%)
3 = 18 (9%)	9 = 9 (4%)
4 = 65 (32%)	10 = 38 (19%)
5 = 4 (2%)	11 = 4 (2%)
6 = 0	12 = 8 (4%)



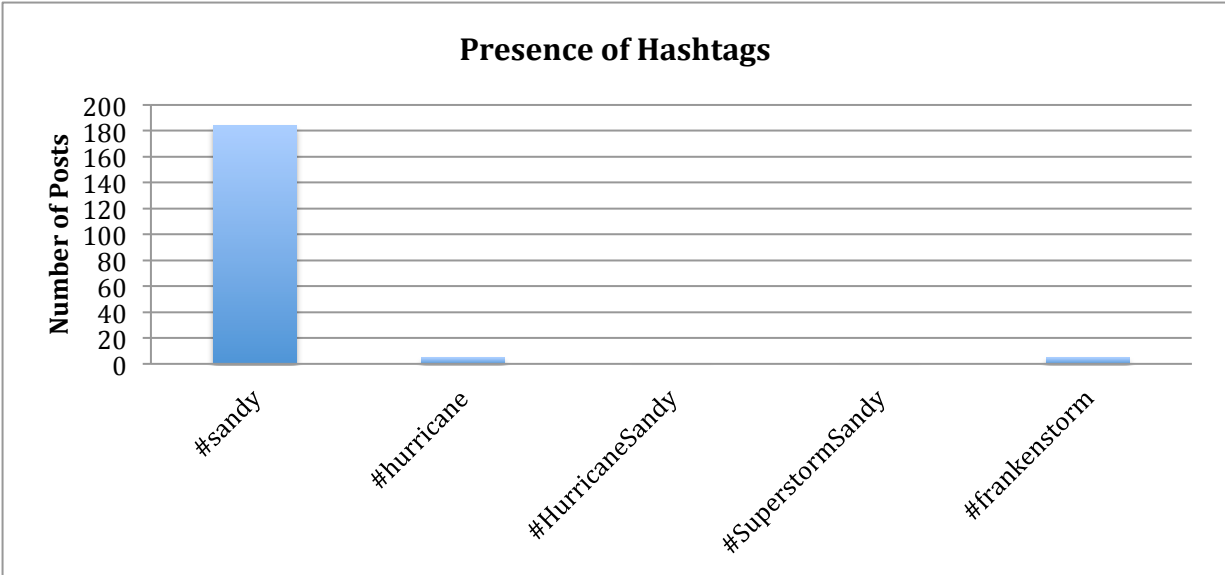
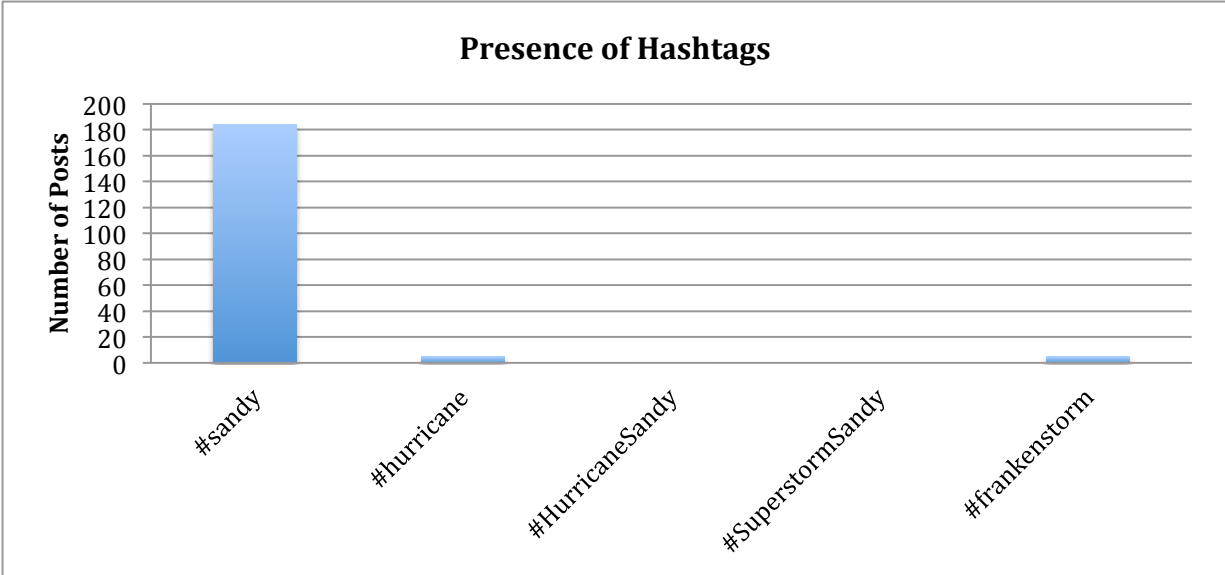
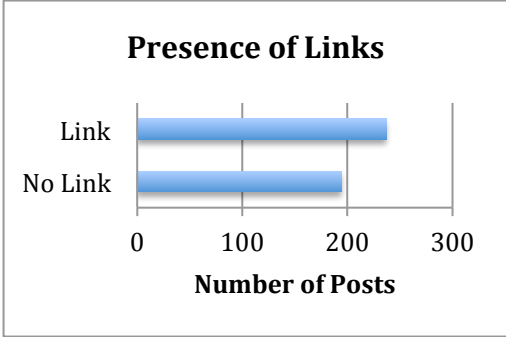
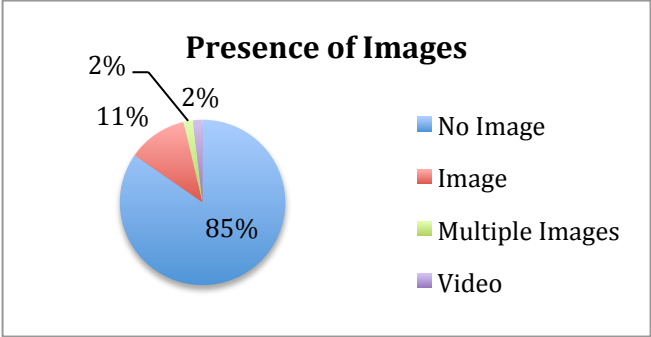
FEMA



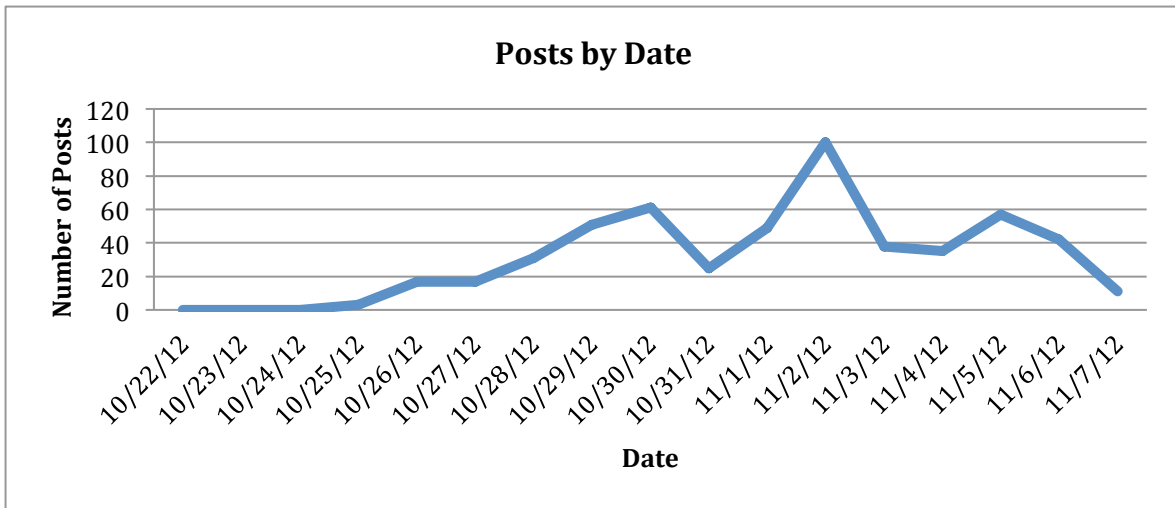
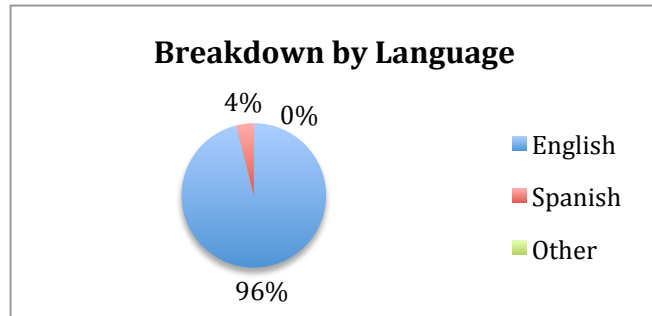
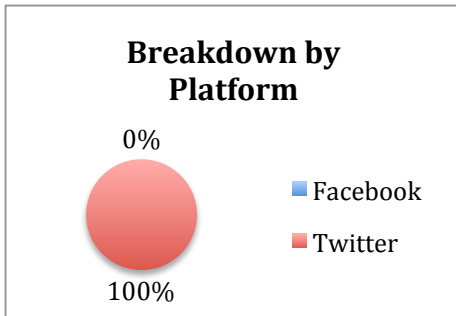
Averages	
Average # of Characters	158.14
Average # of Shares/Retweets	191.44
Average # of Likes/Favorites	78.53



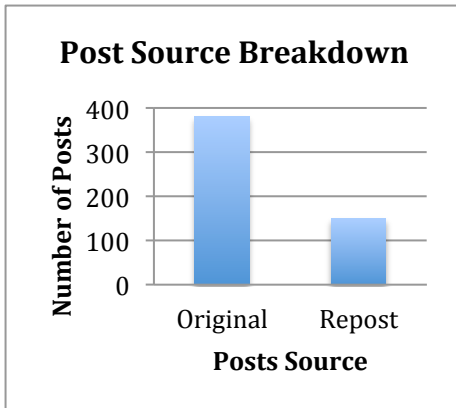
Theme	
1 = 103 (24%)	7 = 16 (4%)
2 = 25 (6%)	8 = 7 (2%)
3 = 37 (9%)	9 = 9 (2%)
4 = 87 (20%)	10 = 37 (9%)
5 = 12 (3%)	11 = 27 (6%)
6 = 1 (0%)	12 = 70 (16%)



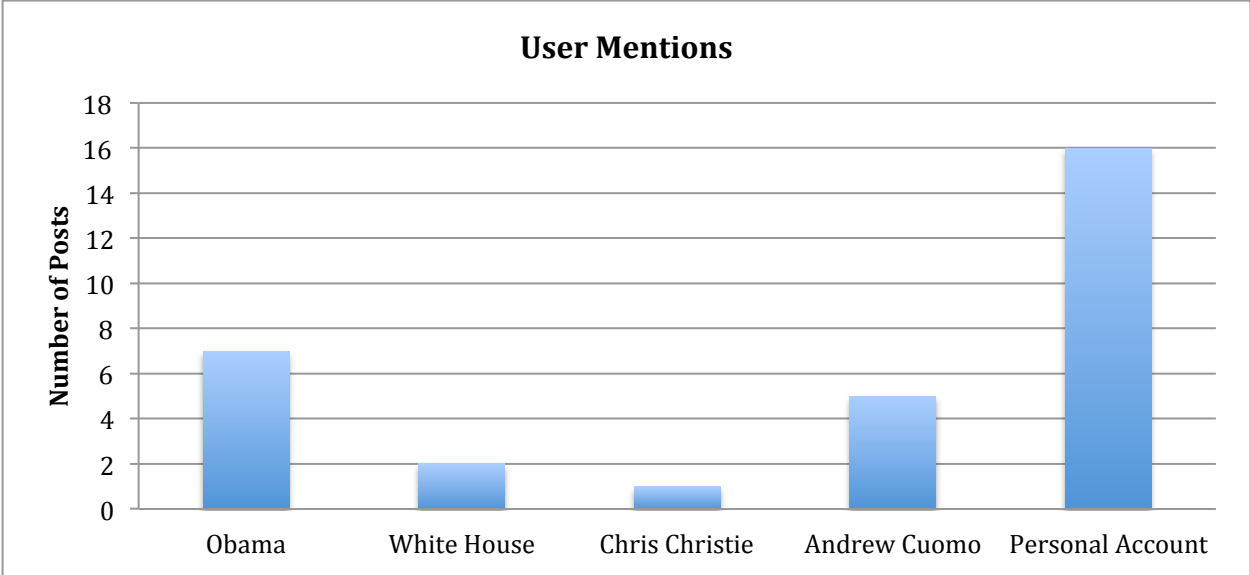
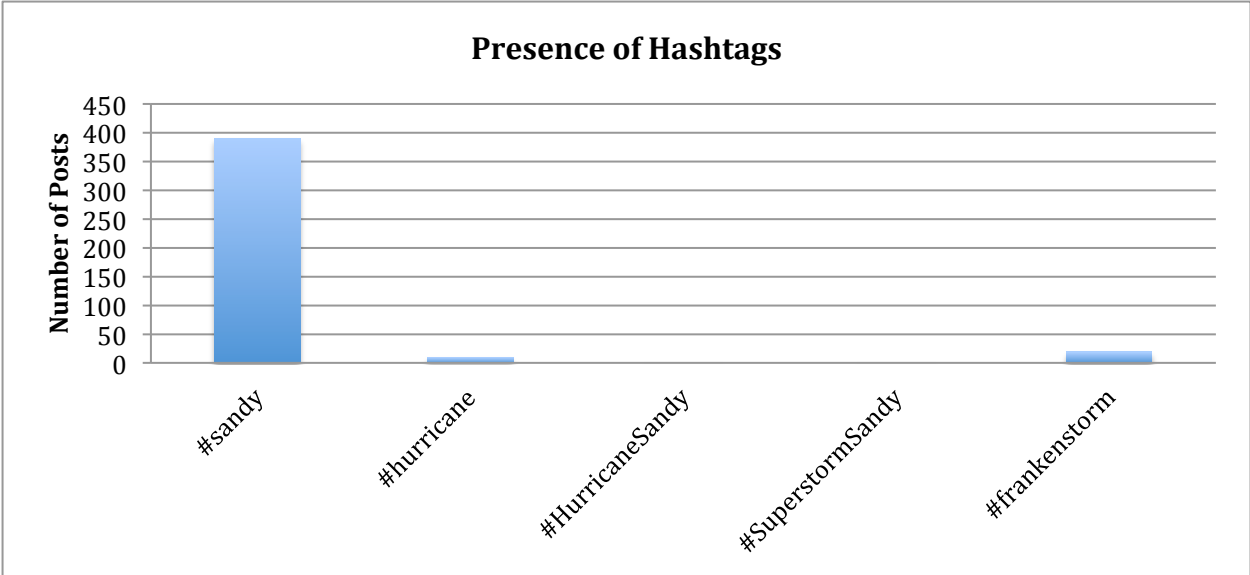
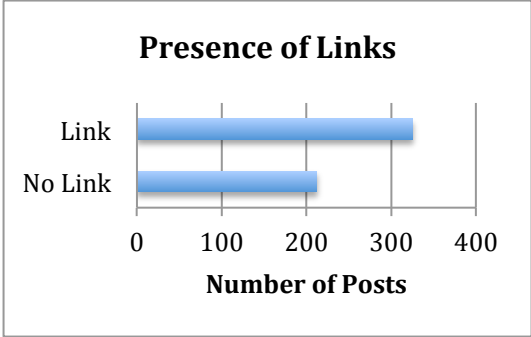
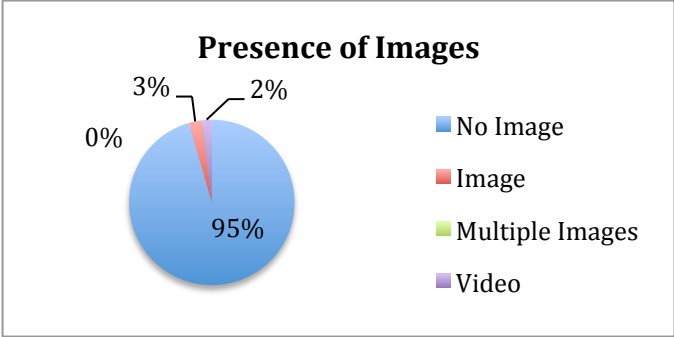
FEMA Region 2



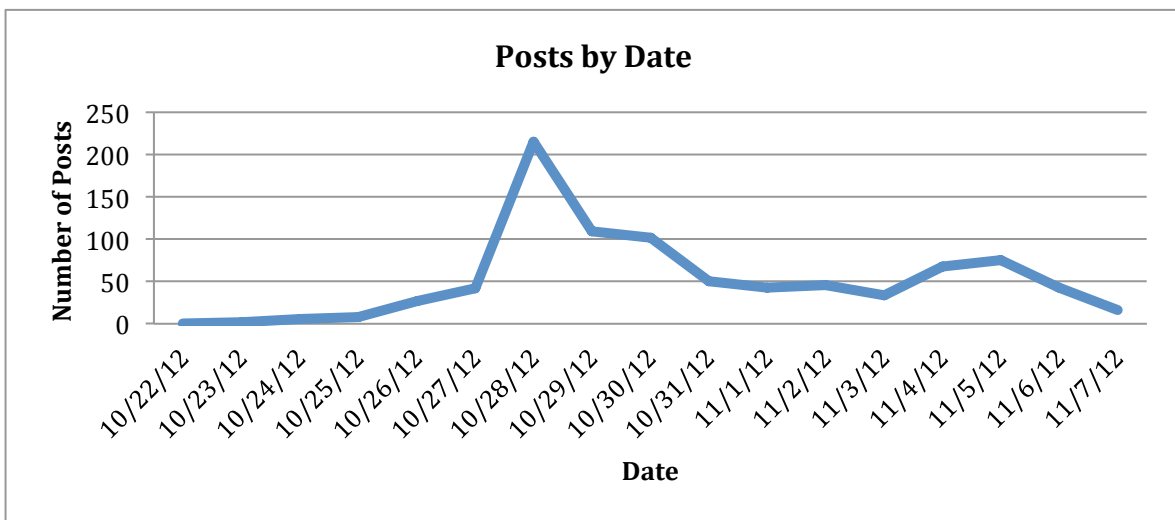
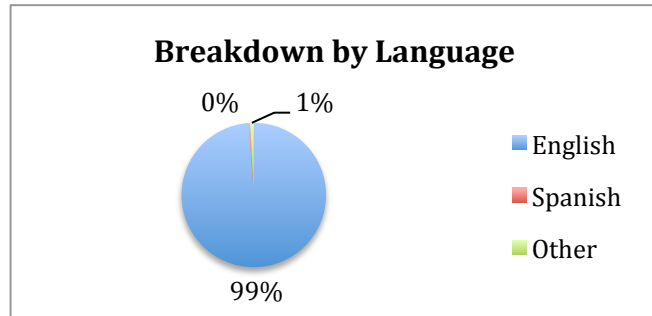
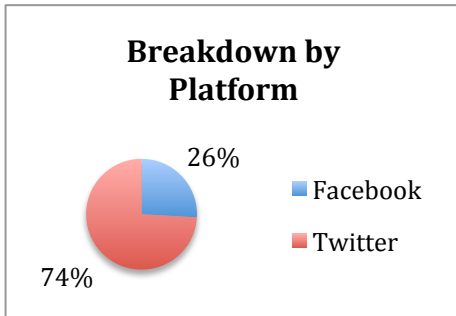
Averages	
Average # of Characters	120.77
Average # of Shares/Retweets	22.01
Average # of Likes/Favorites	2.45



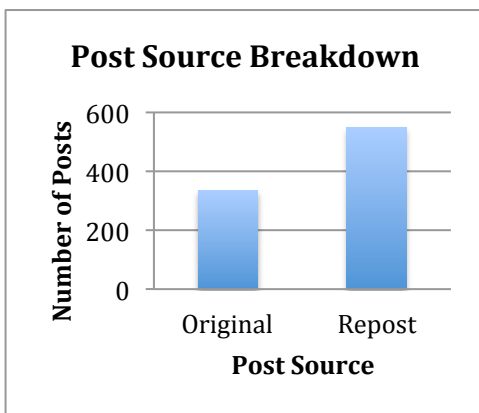
Theme	
1 = 172 (32%)	7 = 7 (1%)
2 = 32 (6%)	8 = 12 (2%)
3 = 66 (12%)	9 = 5 (1%)
4 = 84 (16%)	10 = 64 (12%)
5 = 19 (4%)	11 = 9 (2%)
6 = 15 (3%)	12 = 51 (10%)



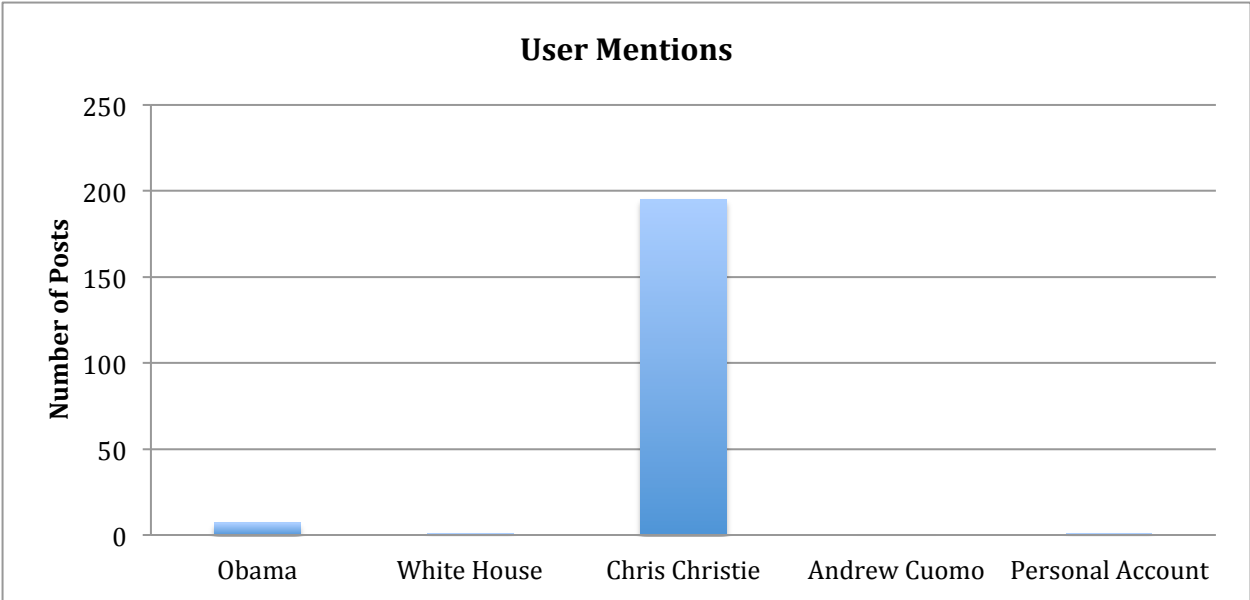
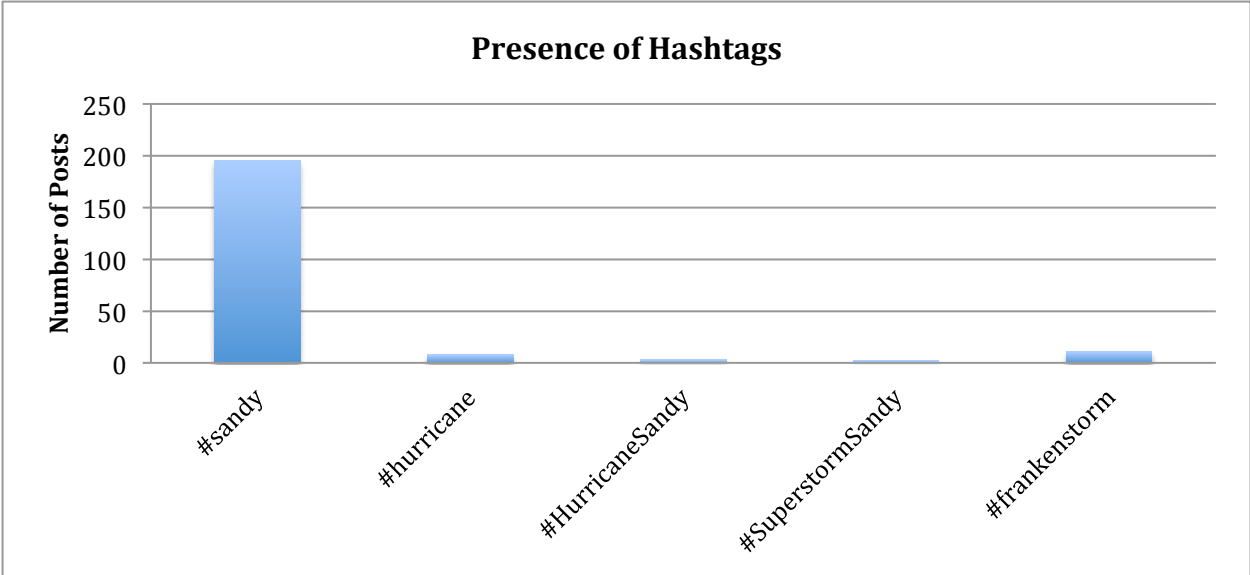
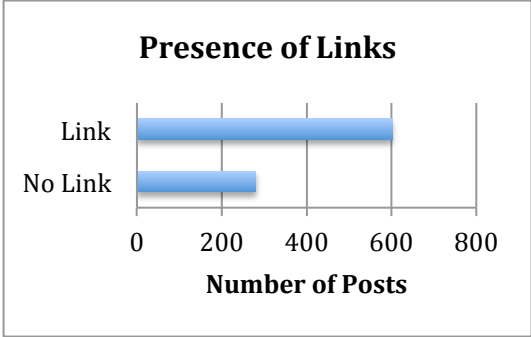
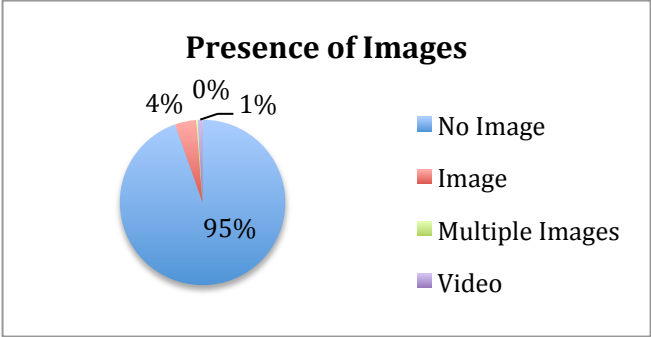
Ready NJ



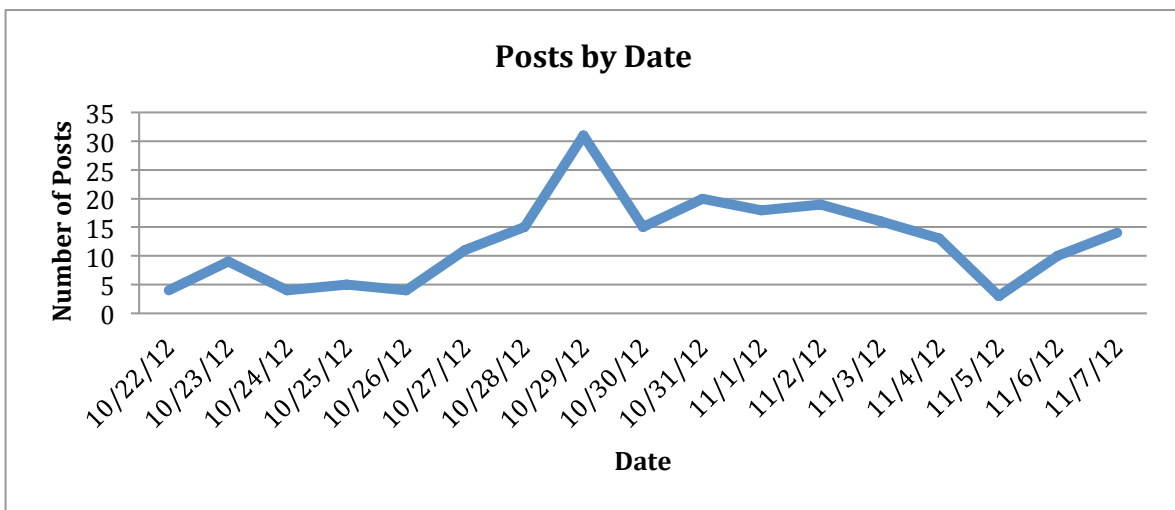
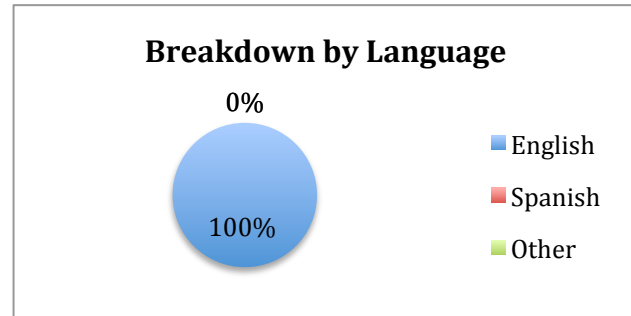
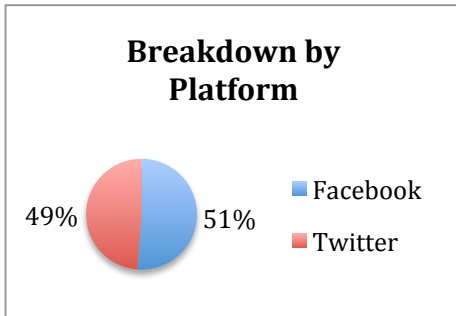
Averages	
Average # of Characters	181.72
Average # of Shares/Retweets	70.75
Average # of Likes/Favorites	20.43



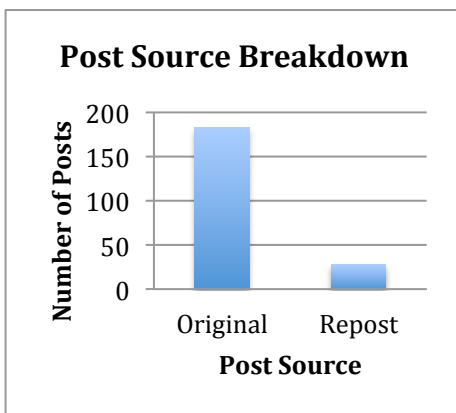
Theme	
1 = 94 (11%)	7 = 40 (5%)
2 = 145 (16%)	8 = 6 (1%)
3 = 44 (5%)	9 = 15 (2%)
4 = 61 (7%)	10 = 32 (4%)
5 = 110 (12%)	11 = 7 (1%)
6 = 109 (12%)	12 = 220 (25%)



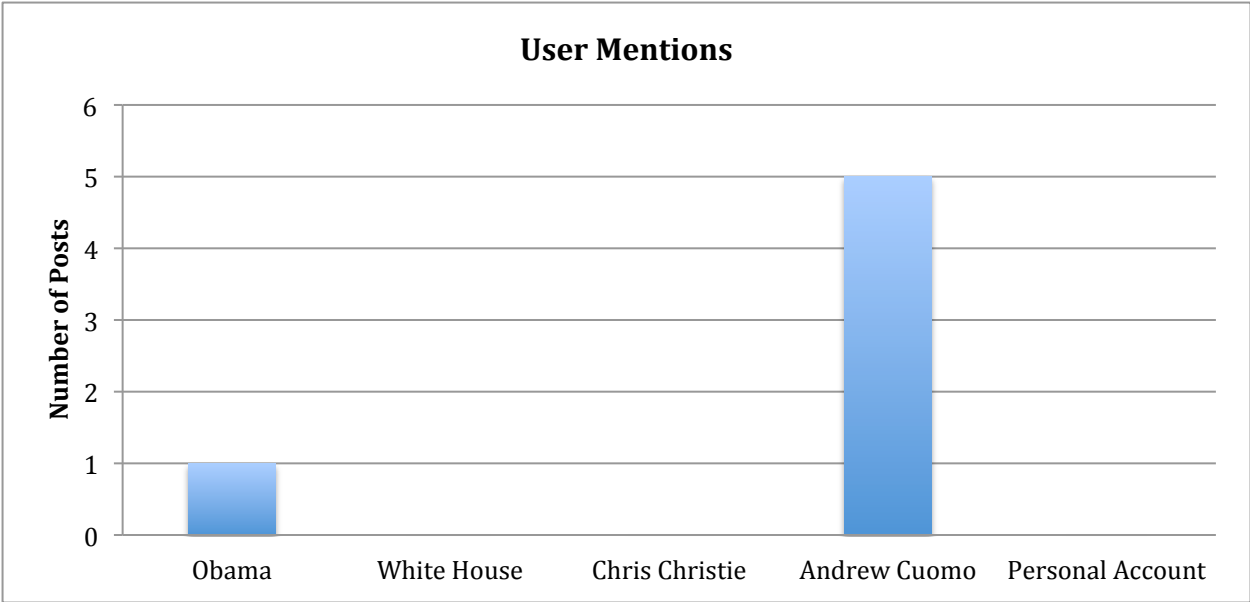
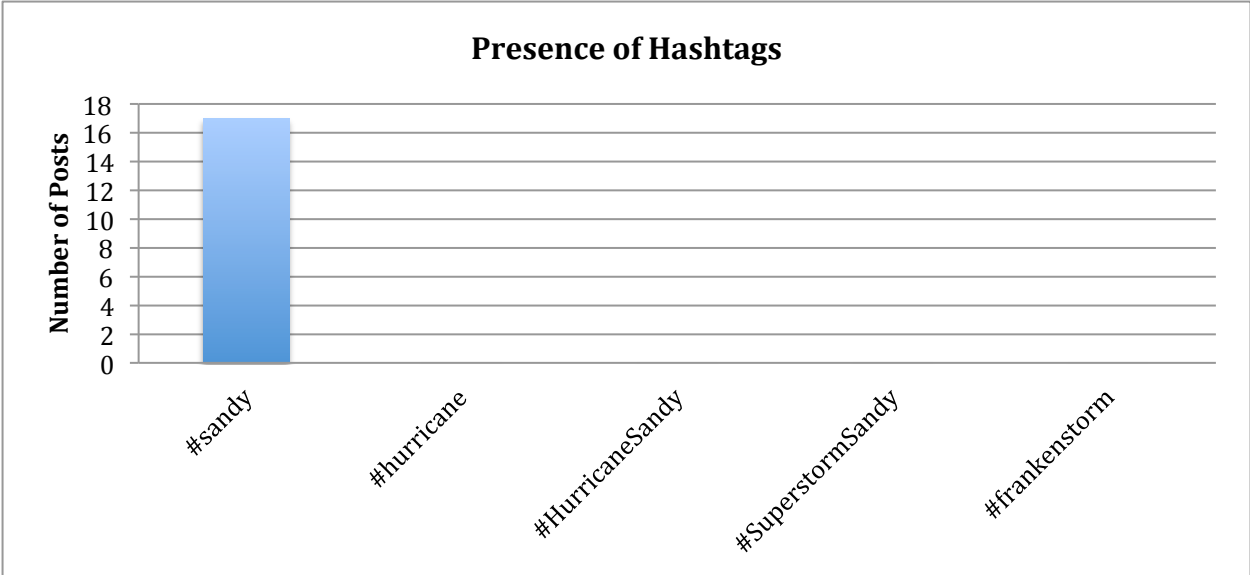
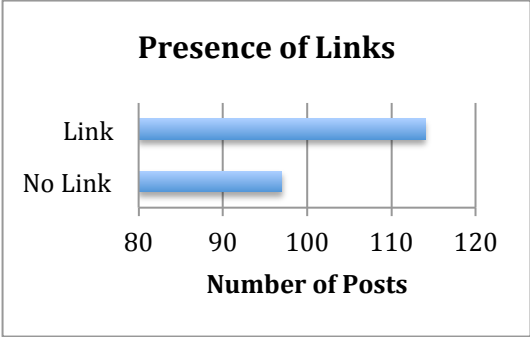
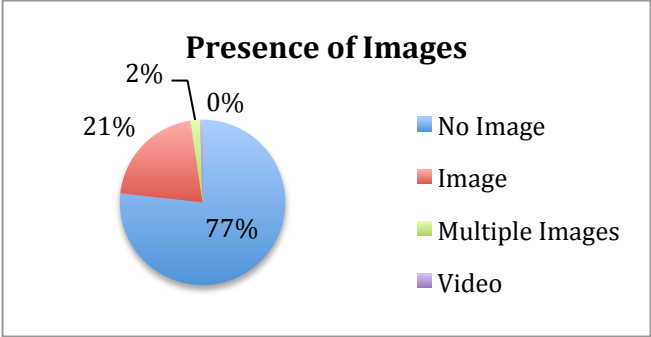
Notify NYC



Averages	
Average # of Characters	151.34
Average # of Shares/Retweets	75.41
Average # of Likes/Favorites	35.60



Theme	
1 = 16 (8%)	7 = 0
2 = 29 (14%)	8 = 0
3 = 9 (4%)	9 = 3 (1%)
4 = 24 (11%)	10 = 7 (3%)
5 = 17 (8%)	11 = 0
6 = 75 (36%)	12 = 31 (15%)



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