

MOTIVATIONS TO TWEET: A USES AND GRATIFICATIONS PERSPECTIVE  
OF TWITTER USE DURING A NATURAL DISASTER

by

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A THESIS

Submitted in partial fulfillment of the requirements for the degree of Master of Arts  
in the Department of Advertising and Public Relations  
in the Graduate School of  
The University of Alabama

TUSCALOOSA, ALABAMA

2012

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## ABSTRACT

On April 27, 2011, Tuscaloosa, Alabama, was struck by an EF-4 tornado. This research investigates how students at The University of Alabama used Twitter during the warning, impact and recovery stages of the disaster. The warning stage refers to the time before the disaster. The impact stage refers to the time during the disaster, and the recovery stage refers to the time after the disaster. Specifically, this research studies four motivations to use Twitter— social, entertainment, status seeking, and information. Each category was studied to understand when people who were motivated by the need to socialize, to entertain, to gain status or to gather information were actively tweeting in connection with the tornado. By using a mixed design ANOVA, the researcher found that students were tweeting significantly more during the recovery stage, which included Twitter use, during the weeks after the tornado. The researcher was interested in knowing which motivation produced the most Twitter use. The social, entertainment, and information motivations produced roughly the same amount of Twitter use. The status motivation did not produce as much Twitter use during the natural disaster. The results suggest that those motivated by social, entertainment or information needs tweet more during the impact and recovery stage. The most Twitter use occurs in the weeks after the disaster during the recovery stage.

## LIST OF ABBREVIATIONS AND SYMBOLS

$M$	Mean: the sum of a set of measurements divided by the number of measurements in the set
$p$	Probability associated with the occurrence under the null hypothesis of a value as extreme as or more extreme than the observed value
Wilks' $\lambda$	Wilks' Lambda probability distribution
$F(x, y)$	$F$ with $x$ and $y$ degrees of freedom
$n$	Number of cases in subsample
$r$	Pearson product-moment correlation
CI	Confidence Interval
Grp.	Group

## ACKNOWLEDGMENTS

I am happy to have this opportunity to thank the many individuals that helped me form this thesis. This journey would have never been completed without the help of my committee, the Advertising and Public Relations faculty, friends and family. Many thanks go to my committee. Thank you Dr. Gonzenbach and Dr. Guadagno for always having an office door open and giving help when it was asked. Most importantly, I want to thank Dr. Horsley for being my committee chair. Thank you for your invaluable insight and constant encouragement. Without your direction, I probably would still be working on my proposal. I would like to take this opportunity to also thank The University of Alabama's Advertising and Public Relations Department. Throughout my time at the University they have inspired me to be involved and grow as a person. I would have never attempted graduate school or my thesis without their support. I would like to especially thank Mrs. Jade Abernathy and Mrs. Cheryl Parker. Thank you for hiring me so many years ago. Without that opportunity, I don't think I would be where I am today.

Finally, I want to extend my sincerest thanks to my family and friends. Thank you for your support and listening ears. I would also like to thank you for keeping me on track and always holding me accountable for my work ethic. I hope you enjoy your much deserved break from listening to me obsess about Twitter and/or natural disasters.

This adventure would never been completed without all of your prayers, guidance, support, and encouragement. I am indebted to you all. Thank you.

## CONTENTS

ABSTRACT .....	ii
LIST OF ABBREVIATIONS AND SYMBOLS .....	iii
ACKNOWLEDGMENTS .....	iv
LIST OF TABLES .....	vi
1. INTRODUCTION .....	1
2. LITERATURE REVIEW .....	5
3. THEORY .....	18
4. METHOD .....	27
5. RESULTS .....	32
6. DISCUSSION .....	50
REFERENCES .....	57
APPENDIX A.....	61
APPENDIX B.....	74

## LISTS OF TABLES

1. Correlations of Information Motivations Variables .....	35
2. Pairwise Comparison of Simple Effects for Social Motivation Categories .....	38
3. Pairwise Comparison of Social Motivation Simple Effects for Time .....	39
4. Pairwise Comparison of Motivation Group and Time .....	40
5. Social Motivation Groups' Mean Scores over Three Stages .....	41
6. Pairwise Comparison of Simple Effects for Entertainment Motivation Categories .....	42
7. Pairwise Comparison of Entertainment Motivation Simple Effects for Time .....	42
8. Pairwise Comparison of Motivation Group and Time .....	43
9. Entertainment Motivation Groups' Mean Scores over Three Stages .....	44
10. Pairwise Comparison of Simple Effects for Information Motivation Categories .....	45
11. Pairwise Comparison of Information Motivation Simple Effects for Time .....	46
12. Pairwise Comparison of Motivation Group and Time .....	47
13. Information Motivation Groups' Mean Scores over Three Stages .....	47
14. Social Motivated Users Mean Score .....	48
15. Entertainment Motivated Users Mean Score .....	49
16. Information Motivated Users Mean Score .....	49

## **Introduction**

The mundane task of calling home became impossible for many college students on the night of April 27, 2011. Around 5:10 p.m. that day, Tuscaloosa, Alabama, was hit by an EF-4 tornado. The tornado was more than a mile wide and created a six-mile path of destruction. The tornado resulted in 53 fatalities and more than 1,200 injured individuals (Morton, 2012).

According to Meredith Lynch, public relations coordinator for the City of Tuscaloosa's Incident Command, the storm left 12% of the city in ruin (2011). City buildings were damaged, along with 600 businesses and thousands of residential structures. On that April day, Tuscaloosa became one of the most popular news stories both nationally and internationally. Tuscaloosa, Alabama, is home to the thousands of students who attend the University of Alabama. The destruction left many of the students and citizens of Tuscaloosa unable to use traditional forms of communication to reach loved ones or find information about the recent storm. Cell phone service was nonexistent for many during that time because the city communication towers were destroyed by the fatal storm (Lynch, 2011). The only way many residents communicated their safety to loved ones was through the use of their smart phones' Internet capability. Because of this event, and others like it, the use of social networks during disastrous events has become an emerging field of study. The April tornado provided the researcher a way to study social networking and crisis communication during a natural disaster.

Previous research has identified three stages of a disaster known as the warning, impact and recovery stages (Vieweg, Hughes, Starbird & Palen, 2010). Disaster communication is



unique during each stage. A combination of traditional media and nontraditional media is normally used to help distribute information, but recently nontraditional methods are becoming more useful during disasters. One nontraditional medium, backchannel communication, is made up of the unofficial peer-to-peer communication that occurs through social networks, text messaging, blogs, wikis and apps (Mersham, 2010). "Backchannel" refers to unofficial peer-to-peer communication that is in contrast with the official or "formal" communications to the public. Backchannel communication does not include the information sent out by emergency officials; it comes from the individuals affected by the disaster. In a study about social media use during a wildfire, residents and emergency workers were able to track the expansion and path of wildfires because social media gave the public an outlet to voice what they were experiencing (Vieweg, Palen, Liu, Hughes & Sutton, 2008). Similarly, social networks were a prominent backchannel medium that was used in Tuscaloosa on April 27, 2011. Because it was one of the few forms of communication that residents were able to use, the use of social networks will be the focus of this thesis.

Although people use backchannels to publicize important but unofficial information, individuals exchange information for different reasons. Some look to give assistance where it is needed. Others might just be curious about the events or try to use them for their own capital gain. By studying the social media activity after the 2007 Virginia Tech shootings, researchers were able to explain that not all social media users have the same motivations during a disaster (Hughes, Palen, Sutton, Liu & Vieweg, 2008). This thesis will explore the needs for using social media during the 2011 tornado as well as help explain social media use at different stages of the disaster.

The uses and gratifications theory developed by Elihu Katz provides the foundation for the thesis research. This theory focuses on the actions of the audience in regards to its media use (Severin & Tankard, 2001). During a disaster, the actions of the public shape the resolution to the problem. If a person has the opportunity to inform other individuals of a hazardous situation, they can save lives and property from damage. But from Hughes' (2008) research, it is known that not all people act in proactive ways during a disaster. To help capitalize on individuals' help seeking and minimize the influence of exploiters, this research attempts to understand the motivations of individuals during all phases of a disaster.

Because of its growing popularity among young adults and its real time nature, Twitter was the social network chosen for this research. Twitter is a social networking site that allows users to produce 140 character bursts of information that are called tweets ("About Twitter, 2012"). Twitter was developed in 2006 to be an outlet for individuals to say what they were doing in the allotted amount of characters. Twitter gave users the ability to share moments of their lives as they were happening (Williams, 2009). The advantage of being able to send updates in real time led Twitter to be a source of valuable information during natural disasters. Eight percent of Internet users are Twitter users (Smith, 2010). The social networking site is popular among young adults, which makes The University of Alabama student population appropriate participants for this study. Because the motivations to use Twitter during a natural disaster have not been studied in depth, this thesis focused on college students' motivations to use Twitter during an actual disaster.

In this thesis, the use of Twitter on April 27, 2011, and the weeks after were examined and studied through an online survey. The survey examined individual needs for using the social networking site Twitter. The survey focused on University of Alabama students and their

motivations. Each stage of the disaster — warning, impact and recovery — was studied to help inform communicators of the unique needs of each stage. Lastly, the research sought to better understand the connections between social media use during a disaster and how it affects later social media use.

The research adds valuable knowledge to the communication field. Results from this study create a better understanding of how people use social media, specifically Twitter, during a natural disaster. Unlike the current research that is available, this research focused on the use of the social networking site Twitter. Twitter has more than 100 million active users, but has not been as extensively studied as other social networks (Bosker, 2011). A better understanding of Twitter use during a disaster can help improve disaster communication efforts among disaster response organizations such as the Federal Emergency Management Agency (FEMA) and the American Red Cross. To better understand the motivations for using Twitter during a disaster, it is first important to understand disaster communication as a whole. In the next chapter, disaster communication and social networks will be given an in-depth look and will provide a strong base for this research to build upon.

## **Literature Review**

### **Disaster Response**

When a disaster occurs it is followed by a surge of communication. There is a necessity for the public to be informed so they are able to keep themselves safe. The Centers for Disease Control and Prevention (CDC) outlines five phases of a crisis communication life cycle. At each phase – pre-crisis, initial, maintenance, resolution, and evaluation – communication is necessary (Reynolds, 2002). The first phase, known as the pre-crisis phase, is the time when alert messages should be tested, and the public should be made aware of how to prepare for a disaster. The next phase is the initial phase. During this time, the public is informed of the impending risk in the simplest form and given information about the course of action during the emergency. The third phase is known as the maintenance phase. This phase is when misinformation is corrected, feedback is gathered, and the public more accurately understands the crisis. Next is the resolution phase. This is when current alerts are improved. This creates a smoother process if the emergency should occur again. The last phase is the evaluation phase. At this time, a frank look is taken at the communication plan that was set up for the disaster. Lessons are learned and documented so that mistakes will not happen in the future. There is no set time for how long each phase should last. All the phases depend upon the emergency that has occurred (Reynolds, 2002). To simplify the phases, disaster communication can be boiled down to three stages known as warning, impact and recovery. The warning stage includes the pre-crisis phase. The impact stage is a combination of the initial and maintenance phase. The recovery stage is made up of the

resolution and evaluation phase. Disaster communication covers all stages of a disaster including the warning, impact and recovery stages (Vieweg, Hughes, Starbird & Palen, 2010).

During a disaster, information can be communicated through traditional media as well as online media. On-site and online communication becomes more intertwined during times of disasters (Veil, Buehner & Palenchar, 2011). During a crisis or disaster, a variety of messages need to be communicated to different individuals. There are many reasons individuals converge around disaster events looking for information (Hughes, Palen, Sutton, Liu & Vieweg, 2008). Many are contacting loved ones to let them know they are safe. Others are looking for more information about the disaster. Some look to help and offer relief.

Research by Hughes, Palen, Sutton, Liu, & Vieweg (2008) pointed to seven roles of individuals who converge around a disaster. These individuals could be helpers, anxious individuals, returnees, supporters, mourners, curious onlookers, or exploiters. The differing communication gives an indication of individuals' motivations during a disaster. The research indicates how individuals are different in their information pursuits, yet they all are looking for information about one event. The research mentioned above examined two disasters: the September 11, 2001, attack on the World Trade Centers and the April 16, 2007, Virginia Tech shootings. These disasters offered researchers an opportunity to learn why individuals come together in an emergency. The types of individuals and their information preference help communicators decide what information is necessary for the public's safety and how the information should be disseminated. For this research, these roles help the researcher better understand the motivations for engaging in emergency communication.

The first type of individual is the helper. This person likes to help first responders and victims. These individuals are spreading information about the event often before official reports

are produced. Online helpers report personal and property safety. During the Virginia Tech shooting, students at the university made Facebook groups that created a central site where family members could find out if their loved ones were safe (Hughes et al., 2008). The speed of the Internet aids helpers because it helps disaster communication occur in a shorter amount of time. Some social networking sites provide real time information on disasters. This information informs helpers on what tasks they could do to help with relief work in the immediate future (Nguyen, 2011).

The second type of audience for disaster communication is the people looking for loved ones: the anxious ones. They are not directly affected by the disaster but are worried about the safety of loved ones who have been hit by the disaster. The anxious individuals are on the outside of the disaster looking in. This type can be satisfied with both active and passive forms of communication. During the Virginia Tech shootings, students were using email, instant messaging, and Facebook groups as a way to let everyone know they were safe (Hughes, Palen, Sutton, Liu & Vieweg, 2008). The act of joining a Facebook group was enough to pacify worried friends and families. By simply joining the group, their families, who are a part of the anxious group, were able to deduce that their students were alive and safe.

Individuals who have left the area prior to the disaster and are looking to return make up the group known as returners. Online sites and applications are aiding these individuals by giving them information they normally would not receive until they get on-site. During Hurricane Katrina, Google Maps provided aerial and satellite images that allowed many to see the state of their own homes and neighborhoods (Hughes, Palen, Sutton, Liu & Vieweg, 2008). This allowed returners to know the status of their property before they went back to their homes.

During a disaster, there are individuals who are not directly affected, but still want to show their support. Supporters are involved with disaster communication by showing gratitude toward disaster responders and giving support to the individuals affected by the disaster. These individuals can communicate by using social media such as groups on Facebook or creating hashtags for Twitter. When they spread their support they are also spreading news and information about the disaster. After the Virginia Tech shooting, Facebook groups were created that showed support for the community. These groups had titles such as *Praying for Virginia Tech*, *Supporting Virginia Tech*, and *Protect the dignity of the Virginia Tech victims!* (Hughes, Palen, Sutton, Liu & Vieweg, 2008). By joining these groups, the members communicated their support.

Disaster communication also involves mourners. People come together on social networking sites to mourn the ones lost and the damage that has been done. Mourners are the ones who hold vigils and memorials at the site of the disaster. Mourners can also come together virtually to remember the disaster. After the Virginia Tech shootings, one user of a social forum known as Second Life created a virtual graveyard that replicated the real life memorial (Hughes, Palen, Sutton, Liu & Vieweg, 2008). Other users could create flowers, candles, poetry, and other items to place at the gravestones that contained the victims' names and short biographies about them. These vigils, both virtual and physical, give all mourners, no matter where their location, an outlet to pay their respects.

The last two types of individuals that will converge onto disaster sites are exploiters and curious onlookers. Both of these groups have no initial connection with the disaster and add nothing productive to the communication surrounding the events. Exploiters use the disaster for personal gain (Hughes, Palen, Sutton, Liu & Vieweg, 2008). These individuals might set up fake

relief funds and solicit mourners, helpers, and supporters to give to their falsified organizations. By utilizing the attention surrounding the disaster, exploiters collect funds from the generous public. Curious onlookers still have no connection to the disaster but their intentions are benevolent in comparison with exploiters. The onlookers will converge onto a physical and virtual disaster site to satisfy their curiosity. Although the intrigued people can get in the way of clean up or upset those who have been affected, they neither receive nor look for personal gain. It is only natural that disaster breeds curiosity (Hughes, Palen, Sutton, Liu & Vieweg, 2008). These individuals are looking to learn more about the disaster from a first responder point of view. By using the Internet and social networking sites, the onlookers can get a better understanding of the disaster from pictures and reading eyewitness accounts. The abundant content on the Internet after a disaster helps keep these individuals from the actual disaster site.

The researchers Hughes, Palen, Sutton, Liu, and Vieweg (2008) created a better image of the individuals who make up a disaster's communication audience. These individuals are the ones who look to both traditional and nontraditional media to find information about the disaster and how they can help. The varied audience explains that different people involve themselves with disaster communication for various reasons. This research expands upon the types explored above by examining use of a particular type of communication channel during a disaster.

### **Social media**

Lately there has been a growing acceptance of using social networking sites (SNS) during emergencies (Vieweg, Hughes, Starbird & Palen, 2010; Hoover, 2011; Yates & Paquette, 2011; Mersham, 2010). Social media use is commonplace, and as such, it is becoming a leading source for breaking news. According to an August 2011 research report by the Pew Research Center, adoption of SNS had doubled in three years. Of adult Internet users, 65% use social networking



sites (Madden & Zickuhr, 2011). This is the first time that over half of adult Internet users interact on social networking sites. Due to this growth, social media is the third most important tool on the Internet for disaster preparedness and response ("Facebook DC live," 2011).

According to a recent survey conducted by the American Red Cross, 60% of the general population receives disaster related news online. Of the general public, 23% receives news information from Facebook (18%) and Twitter (5%) (Harman, 2011). Younger and college-educated individuals are more likely to use social networking during these times (Smith, 2010). Social networking sites are being repurposed to help in disaster relief. When traditional forms of communication are down, other channels are there to be used (Harman, 2011). From the 2010 earthquake in Haiti, FEMA learned that all forms of communication are not lost during a disaster. During the earthquake, survivors and rescue workers used text messaging, email and social media to connect with others during the chaotic time (Hoover, 2011). Social media provides communication outlets when other channels are unavailable (Silverman, 2010).

In the past, communication after a disaster was lacking timeliness. Social networks allow the audience to be the content producers. This leads to social media providing information before official information can be released. Although it is a common concern that false information can easily be spread and negatively affect individuals, Mersham (2010) explained that the unofficial reports from individuals using social media can be more accurate and beneficial than nonexistent official reports. Mersham studied disaster communication during the 2009 tsunami threat in New Zealand. During the threat of a tsunami, citizens utilized unofficial peer-to-peer communication known as backchannel communications. This type of communication can occur over a variety of media such as social networking sites, text messaging, blogs, wikis, and other web forums (Mersham, 2010).

Social media is not exclusively used to find information. From its survey, the Red Cross learned that individuals believe that social networks will work as a call for help. The Red Cross survey was conducted by telephone and online to better understand the perceptions of social media use during a disaster. In the study, the results from individuals who took the survey over the phone reflected the general population. The survey was also disseminated via the Internet to collect data from the online population. If they were to be unable to reach the EMS through traditional media, 22% of the general population and 26% of the online population would try an online channel to receive help. Nearly a quarter, 24%, of the general population would use SNS to let their loved ones know they were safe. Of individuals who already use the online sites, 30% would definitely use SNS to contact their loved ones. Those who use social media during a disaster not only believe their voice will be heard, but they also believe action will occur. At least one third of both the general and online populations believe not only that help will come but that it will arrive within an hour of the message being posted. The public thinks it is important for emergency response teams to actively use and monitor their online presences. Although the general and online population believe that these online sites should be monitored, 65% of the online population and 46% of the general population doubt that they are (Harman, 2011). The Red Cross survey revealed that the public believes social media can be an active part in disaster response.

Using social networking sites adds a human connection to communications about the disaster. The new media adds visuals and interactivity to a topic (Veil, Buehner & Palenchar, 2011). In one study it was discovered that during an emergency, people affected by the event would post to social media and provide information about the emergency including a detailed location of the event (Palen et al., 2010). Sometimes these posts are accompanied by images of

the disaster. The images provide a first hand assessment that can be placed with other eyewitness accounts to create a more complete view of the disaster. It is useful at all stages of an emergency including warning, impact and recovery stages.

Social networking sites prove that they are beneficial by the number of people they reach. By using social media, important information is sent directly to the people. The Boston Public Health Clinic used social media as a way to reach its public during the H1N1 outbreak. The clinic used its Twitter and Facebook accounts to provide supplemental information about the outbreak. While official reports sent through traditional media listed the sites of vaccination clinics, its Twitter account informed followers of when there was no wait at the clinic. This encouraged followers to get vaccinated. Even though it was helpful, the use of social media has not replaced Boston Public Health Clinic's traditional forms of media. Television is the medium that most people turn to in an emergency, and social media is a supplement to that and other traditional media (Tucker, 2011).

Because there has been an increase in acceptance of social media use during disasters, organizations have included social media in their response plans. FEMA has learned that the public reports better assessments of the current situation than many FEMA agencies could (Hoover, 2011). FEMA administrator Craig Fugate explained that the public could be a resource for FEMA and other emergency agencies because it is creating a better situational awareness. Fugate stated that using social media is a great way to "free the data" (Hoover, 2011). FEMA is working on adapting various social media platforms to spread news about emergency preparedness and disaster relief (Hoover, 2011).

## **Twitter**

According to Nielsen research, the top social network that Americans use is Facebook, closely followed by blogs, Tumblr, Twitter and LinkedIn ("State of the," 2011). Of adult Internet users, 15% are using Twitter (Smith & Brenner, 2012). This social networking activity is popular among young adults, minorities, and individuals who live in urban and suburban areas. Of young adults between the ages of 18-24, 31% are Twitter users. Of Twitter users, one third of them check the site daily or multiple times per day, but nearly half, 48%, check the site every few weeks or less (Smith, 2010). Of the social networks listed, Twitter will be the primary focus of this thesis.

Twitter is a microblogging website that allows users to create messages no longer than 140 characters. The short messages are referred to as Tweets. With this particular social networking site, users can create tweets, reply to other tweets, send direct messages to individuals, retweet other tweets, share pictures, share websites, and create hashtags to aid in search for information. Twitter users follow individuals, organizations, and corporations from whom they like to receive updates. Tweets can be received and sent through email, text messaging, instant messaging, the Internet, and other third-party applications (Hughes & Palen, 2009). When users visit Twitter, they see multiple tweets that have been sent publicly by the individuals, organizations, or corporations that they follow. Individuals initially used Twitter as a platform to mention simple musings to a group of peers (Williams, 2009). Due to Twitter's real-time nature, the social networking site has been utilized for other reasons. Twitter is now being used as an additional platform to address customer service, as a source for breaking news, and as an aid for job searching, to name a few (Gannon, 2011).

Another emerging use for Twitter is the use of Twitter for good (Gannon, 2011). For example, during the London riots in 2011, Twitter users were able to use the Twitter search feature to locate where the riots were occurring. During this time, many people who were not signed up with Twitter used the site as their main search engine. A constant stream of updates helped keep many residents safe (Gannon, 2011). Alternately, mobile technology also helped in the organization of these riots. The London riots were organized using Blackberry messaging. This type of messaging is similar to an individual updating his or her Facebook status or tweeting (Ladhani, 2011).

One in five Twitter users post personal updates at least once a day. News stories and updates are also popular posts. Of all Twitter users, 55% share links to news stories (Smith, 2010). Even with a small percent of people on Twitter, Mark Jones, the global communities editor at Reuters, stated that although the audience is not on Twitter, the news is ("The people formerly," 2011). Twitter changes how news is gathered and spread. The news is no longer gathered only by journalists. Readers and viewers are able to add to the information pool. This gives rise to "horizontal media," referring to the public's ability to share links via Twitter and other SNS, allowing for larger numbers of people to receive information without the involvement of traditional media. People become their own broadcast network by sending tweets. Besides sending unique tweets, Twitter also allows users to retweet information. Retweeting means a person can send his or her followers a tweet that was originally posted by another user. Starbird and Palen (2010) specify the act of retweeting as an informal way for one user to recommend information to another user. A little over half (53%) of users retweet material (Smith, 2010). The recommendation system that each individual user has developed to decide which information to

pass along is used for all tweets, pictures, videos, news articles, or even jokes. Retweeting lets users pass on information they deem important.

During an emergency the majority of tweets that are retweeted originate from users who were near the disaster. One study reported that 10% of all emergency-related tweets that are sent by local individuals are retweets. Starbird and Palen (2010) indicated that although information is being passed around on Twitter, the initial information comes from local media and emergency management agencies. The information that is spread during an emergency on Twitter is not all valued the same. The broader audience is made up of curious onlookers who look for information in a voyeuristic manner, focusing on journalists' accounts of the transpiring events. They are retweeting sensational headlines, pictures and stories. The local audience is using Twitter to distribute information that is important or helpful to them locally. Research that studies retweeting behavior is another way to see how Twitter is a social medium that serves a diverse group of users in an assortment of ways.

In Vieweg, Hughes, Starbird, and Palen's (2010) research, they compared tweets that were sent during two different emergencies, the Red River Floods and the Oklahoma Grassfires that both occurred in the spring of 2009. The information that users tweeted was similar but varied depending on the type of emergency. Of tweets about the Oklahoma fires, 40% included geolocation information, while only 18% of the tweets about the Red River floods contained the same information (Vieweg, Hughes, Starbird & Palen, 2010). This suggests that Twitter allows for very detailed and specific information to be disseminated to a specific audience. It also allows for general information to reach a wider audience. Twitter's constant stream of real-time information allows for communication during the warning, impact and recovery stages. Each phase of the disaster saw tweets containing information that could be divided into two categories:

community-related information and personal information. Not all tweets about an emergency will have the same message and objectives, but they will help add to the information pool.

Previous research shows that after a natural disaster, such as the one that affected Tuscaloosa, there is an increase in Twitter adoption rates. Hughes and Palen (2009) discovered that during hurricanes Gustav and Ike, as well as during the Republican and Democratic national conventions, there was an increase of new active users to Twitter compared to a general sample around the same time. The individuals that joined Twitter around the time of the events and posted about the events were more likely to be active users in the future compared to the general sample. This suggests that when individuals personally experience the usefulness of Twitter, they are likely to adopt the technology and be long-term users. In their research, they discuss that people can be "information hubs" that collect and distribute information and people can "participate" in the information pool in a nonessential way (p. 6). Their study focused primarily on the active users and their role as information hubs. This thesis further investigates the motivations for using Twitter after a natural disaster and looks at all users of Twitter, not just active users.

Previous research has looked at the motivations that result in using Facebook, but there is little research addressing the motivations of using Twitter. During a disaster, helpers, anxious individuals, returnees, supporters, mourners, curious onlookers, and exploiters have various motivations for their communication. Social networking sites provide a platform for all their voices. Of social networking sites, Twitter allows responders to give information in real time that aids emergency communication unlike any other social network. This research expands upon the knowledge of Twitter and its users' motivations.

As using social media during a disaster becomes more common, so too does its popularity as a topic for communication research. This thesis focuses on the use of Twitter during a natural disaster by utilizing the uses and gratifications theory to create a better understanding of the motivations of disaster communication. This theory helps explain how various motivations produce different actions among social media users during a natural disaster. The next chapter describes the uses and gratifications theory and explores its fit for social media research.



## Theory

Most communication theories primarily focus on what the media portrays to the public. Elihu Katz challenged researchers to, instead, think about how people contribute to the media. With this simple question, Katz paved the way for the uses and gratification theory.

Many believed that communication research was dying. Katz (1959) breathed new life into it by posing new questions. In his earliest article, discussing the new way to approach how people and the media interact, he cites studies by Berelson (1949), Riley and Riley (1951), and Herzog (1944). In Berelson's study, Berelson took advantage of a newspaper strike in Philadelphia and watched how it affected people's media use. In Riley and Riley's study, the researchers studied how children use adventure stories when they are playing make believe. The last study is Herzog's work with women who watched soap operas. Herzog was able to list reasons why women were watching daily radio serials, programs we would now categorize as soap operas. Herzog's 1944 article was the first published research that examined media gratifications in-depth (Baran & Davis, 2003). From these studies, Katz was able to explain that people use a variety of media for different reasons (Severin & Tankard, 2001).

Katz, Blumler, and Gurevitch (1974) initially outlined the objectives of the uses and gratifications theory. First, the theory should explain how people use the media to reward their own needs. Second, the theory should help researchers understand an audience member's media behaviors. Finally, the theory should identify functions or consequences as a result of needs, motives and behaviors. The theory focuses on the origin of needs and the expectation of a media outlet to satisfy those needs.

As media usage has changed, Rosenberg (1974) and Katz and his collaborators (1974) simplified the tenets of uses and gratifications. The initial tenets have been revised and are now modeled in a contemporary view that is grounded in five assumptions. The first assumption is that the choice of media is a conscious choice that an individual makes. They purposely choose a medium with an objective to be achieved. The second is the assumption that the audience is active. A person will select the medium because it will satisfy his or her need. The audience has to believe there is a link between desire and the media reward (Severin & Tankard, 2001). The third belief is that a user's previous media use shapes how he or she uses media in the future. The assumption is that they will use the previous knowledge about a medium to choose one that will result in gratification. The fourth assumption is that an audience is at the mercy of its own psychological and social factors. The medium chosen will satisfy desires based on these factors. This assumption also explains that other forms of media are competing to satisfy an individual. The audience has to choose a medium that is competing with other sources to fulfill the desired need (Severin & Tankard, 2001). The audience is able to choose the best qualifying media to fulfill its desire. The fifth and last assumption is that people can be more influential than the media. It is through a person's initiative that the patterns and consequences of media use are decided (Bryant & Zillmann, 2002). The combination of these five basic assumptions creates the base of the uses and gratifications theory.

The reason that individuals use different media has been studied at length. There are several needs that users would like to satisfy. Some needs are universal, while others can be very unique. McQuail, Blumler, and Brown (1972) suggest four categories of classification. The first type of need that an individual may have is a diversion need. These individuals are looking for an entertaining escape from their daily routine. The next type of need is a personal relationship

need. This need looks to media as a stand-in companion. The third type of classification is personal identity. This need manifests itself as looking for self-understanding in media. The last classification that the researchers describe is the surveillance category. This category represents needs for individuals to find information, especially the information that might affect them personally.

Although these are very representative, Katz, Gurevitch and Haas (1973) saw mass media as a way to connect or disconnect with others. They created a list of five categories that classify an individual's needs that lead them to using mass media. These categories are a simplification of 35 psychological traits that individuals possess. The first category is cognitive needs. Almost everyone has a need at one point in his or her life to acquire new information. The individual who is trying to act on a cognitive need is looking for some kind of understanding. The second type of need is an affective need. This is the need to find an emotional and/or pleasurable experience. The third type of need is the personal integrative need. This reflects the need many individuals have to validate themselves. These people are interested in strengthening their credibility, among others. The fourth type is the social integrative need. The social integrative need explores the social connectivity need that individuals have. This is the need people have to strengthen their contacts with family and friends. The last need is the tension release need. This is most like McQuail, Blumler, and Brown's (1972) diversion type. The tension release need is the need that some individuals have to escape their own realities. They are welcoming diversions into their life. The five categories give broad groupings of motivational factors (Severin & Tankard, 2001). These five categories provide the media needs that are studied in this research.

## **Criticisms**

Over the years, the uses and gratification theory has not been immune to criticism. Some believe that the needs that are created only rationalize an individual's media use instead of producing a cause and effect relationship. The theory could be flawed because it doesn't account for social status in relationship with media choice. The theory relies on psychological concepts. For the uses and gratification theory to be a valid theory, researchers expect an individual to develop a need and find an appropriate media to fulfill it by their own choosing. Often media reflects the world-view, causing information to be skewed. Although the individual might be choosing his or her own readings, he or she is actually consuming preferred reading. This criticism will not affect this particular thesis, since in this thesis we will be focusing on one incident. Instead of studying general media uses and gratifications, this study will focus on the communication needs that surrounded the disaster. The research subjects for this study were purposely looking for material that might otherwise be labeled as "preferred reading." Another criticism states that media use could not be based on need and instead be a habitual pastime (Severin & Tankard, 2001). Lee and Ma (2011), who will be discussed later in this chapter, discovered that individuals who visited some social networking sites (SNS) habitually were likely to visit the same sites to share news stories, despite what their actual need may be.

## **Uses and Gratifications in Research**

Uses and gratifications theory is an appropriate theory to use when studying social media. The two-way nature of social networking sites requires an audience to actively choose the medium it wants as well as to decide how it will use that medium (Park, Kee & Valenzuela, 2009). Social media varies from traditional media because of the action it requires of the audience. Instead of an individual simply reading a newspaper or watching a television program,

a user is now able to connect and interact with other people on social networking sites. The individual has the ability to choose how involved he or she wants to be with the medium as well as how it will best serve him or her. In this thesis, the researcher focused on the audience actions and what needs they were fulfilling. The research focused on one SNS, Twitter. This theory can help create an understanding of an audience's information needs and media use.

### **Facebook Features**

Although the uses and gratifications theory has been used to study SNS, little research has been done on one SNS channel to look at all the features and what needs motivate a user to use one feature over another. Smock, Ellison, Lamp and Wohn's (2011) research studied the motivations for using different features of the social networking site Facebook. Facebook is a SNS that helps build bridges between online and offline communications. Many SNS have multiple features like commenting on friends' posts, favoriting/liking posts, replying to friends' posts, adding pictures, and sharing music or videos, to name a few. The SNS Facebook is seen as a collection of tools that are used for different needs. Of the SNS features, the researchers explored the uses and gratifications for status updates, comments, wall posts, private messages, chat, and groups. The study goes beyond general usage and gives insight into nine motives for using Facebook. These motives include habitual pastime, cool and new trend, entertainment, information sharing, escapism, companionship, professional advancement, social interaction, and meeting new people. These motivations are the basis for this thesis research.

The research questions by Smock, Ellison, Lamp and Wohn's (2011) assessed what motivations result in the use of specific features. Results from the study showed significant results for certain motivations linked to certain features. The expressive information sharing motivation was significantly linked with the status update feature. The comment feature was

most used by Facebook users who were looking for entertainment, companionship and general social interaction. General social interaction was also a predictor for writing on friends' walls, along with the need for professional advancement and using the social media feature as a habitual pastime. Two significant predictors were discovered for using private messages. People use private messages for professional advancement and social interaction. The last two features, Facebook chat and Facebook groups, were significantly predicted by the motivation of social interaction. Expressive information sharing joined the need for social interaction as a predictor for using the Facebook groups' feature. The study also found significant demographic difference in the use of features. Age and race demographics will not be a focused part of this thesis research.

Smock, Ellison, Lampe and Wohn (2011) questioned if the listed motivations were the same for general use. They discovered that only three of the needs listed—relaxing entertainment, expressive information sharing, and social interaction—predicted general Facebook use. This research found that individuals choose their SNS and the specific features on it to fulfill their specific needs. To follow this study's approach, this thesis research focused on the specific motivations of using Twitter.

### **Facebook Groups**

The uses and gratifications theory has been used to study how individuals might choose specific features of social media. Park, Kee and Valenzuela (2009) studied how an individual's need might affect his or her use of Facebook groups. Specifically, the researchers were looking at how Facebook groups are linked with political and civic engagement. This study identifies the needs for using Facebook groups. Some argue that specific uses and gratifications on SNS may produce different social outcomes. For example, one study discovered that information pursuits

lead to more social involvement than entertainment motivations. Just as needs produce various results, the selected media offers varied rewards. The gratifications achieved by using online groups could be vastly different than the gratifications received from another SNS or even other features on the same SNS. Online groups, through their networks, have the ability to strengthen social contacts, community engagement, and attachment. Through their research, Park, Kee, and Valenzuela (2009) have compiled a list of four primary goals for participating in Facebook groups: socializing, entertainment, self-status seeking, and information. These are no different than the basic needs many media users attempt to fulfill.

By joining Facebook groups, members met these needs in different ways. The research studied college students and how they used the groups. Individuals who used the group feature to fulfill a socializing need commonly used groups to put together meetings and get peer support. They were looking for a sense of community. To fulfill the entertainment gratification, students used groups for amusement. They benefitted from the leisure and enjoyment the groups provided. The individuals who had information motivations generally used the groups to learn about on and off campus events. They also used the group function to learn about new products or services. Finally, students were likely to use Facebook groups to maintain their personal and social status. These individuals felt that joining groups would make them look cooler and help develop their career (Park, Kee & Valenzuela, 2009).

There were also significant results found among the various individuals who were studied. Park, Kee, and Valenzuela (2009) found significant results that increased the understanding of why undergraduates use the group feature. The younger students were joining groups for socializing. They were likely to engage in the groups for entertainment needs. They also joined groups because they felt pressured by their friends. If they joined the groups, they were making

their social status increase among friends. The research explains that although groups are one feature of the SNS Facebook, they offer different rewards. This research will not just look at the needs that result in the general use of Twitter, but instead will examine the motivations of using a myriad of Twitter features during a disaster.

### **Social Networks and News Sharing**

Lee and Ma's (2011) research also addressed other predictors for sharing news stories on SNS. Like prior research, they studied the following needs: information seeking, socializing, entertainment, and status seeking. The information seeking, socializing and status seeking gratifications were all significant predictors of users sharing news on social media sites. It seems likely for information seekers to post news. Information seekers are likely to post news stories so that the stories will be available for future retrieval when information is needed. Sharing content meets both the needs of the individual as well as the individuals that are in the user's social network. Socializers spread news stories in hopes that it will lead to potential social relationships. The anticipation of such relationships is the motivating force to share a news story. Sharing news stories on social media sites is also motivated by the status seeking need. The need to improve one's status comes from the desire to increase credibility, self-esteem and self-confidence. By sharing news over a social media site, an individual helps others gain access to information that they may find relevant. Users hope that by sharing relevant stories they may earn a place as an opinion leader among their friends.

The current study expanded upon the previous studies. The research creates a better understanding of the general motivations to use Twitter. The uses and gratifications theory was used to understand how individuals' needs during the April 27, 2011, tornado were fulfilled through Twitter. Evidence from previous research made clear that this theory is appropriate to



apply to this phenomenon. The next chapter will explain how the uses and gratifications theory was used to test students' participation in using Twitter during a natural disaster.

## Methods

After consulting past research and extensive reading on various communication theories, the researcher developed five research questions that were explored in the thesis research. By exploring the following research questions, the base of knowledge about social networking during a natural disaster was expanded. The research questions focused on Twitter use before, during, and after the April 27, 2011, tornado that ripped through Tuscaloosa.

RQ1: At which stage were Twitter users motivated by the need for socialization most likely to tweet?

RQ2: At which stage were Twitter users motivated by the need for entertainment most likely to tweet?

RQ3: At which stage were Twitter users motivated by the status seeking need most likely to tweet?

RQ4: At which stage were Twitter users motivated by the need for information most likely to tweet?

RQ5: Which motivation produced the most Twitter use?

From the literature review, it is understood that crisis communication can be divided into three stages — warning, impact, and recovery (Vieweg, Hughes, Starbird & Palen, 2010).

Twitter use during the three stages was studied in this research. The first stage is known as the warning stage and includes the crisis communication used before a disaster. For this study, communication during the warning stage was defined as all the communication that occurred the week before the tornado hit until 5:10 p.m. on April 27, 2011. The next stage studied was the

impact stage. The impact stage was defined as all communication that occurred during the tornado and immediately after. For this research, the impact stage reflects all social network use from 5:10p.m. on April 27, 2011, until 72 hours later on April 30, 2011. The last stage of crisis communication was the recovery stage. This study focuses on recovery communication that occurred in the weeks after the tornado, from April 30, 2011, until May 14, 2011. During that time, recovery communication was at its peak. The three stages of crisis communication are appropriately represented in this study beginning the week before April 27, 2011, until the end of May 2011.

For this study, information was collected through an online survey (see Appendix). Survey research has advantages that led the researcher to choose the survey method for this study. Using a survey reaches a large number of participants without incurring a large cost (Wimmer & Dominick, 2010). The survey easily gathers information from a variety of individuals. The survey measured Twitter use during the warning, impact and recovery stage of the April 27, 2011, tornado. The survey also measured a user's motivations for using Twitter. Smock, Ellison, Lamp and Wohn (2011) outlined nine motives for using Facebook features. The motives they studied are using Facebook as a habitual pastime and as a cool and new trend as well as for entertainment, information sharing, escapism, companionship, professional advancement, social interaction, and meeting new people. These specific motivations have not previously been applied to Twitter use. Because Facebook and Twitter are similar social networking sites, the researcher used the same motivations and applied them to Twitter.

The nine motives from Smock, Ellison, Lamp and Wohn's (2011) research were divided into four categories that serve as the independent variables for this study. The first motivation category is the social category. This motivational category measured how often an individual

uses Twitter for companionship, social interaction, and for meeting new people. The next motivational category measured how much a person uses Twitter to increase his or her status. The status seeking motivation was measured by asking questions pertaining to using Twitter for professional advancement and as a way to keep up with the social network trend. The third motivation that affects users was the need to find information and be informed. Survey questions determined if the Twitter user was using the social networking site to stay informed about the latest local, national, and international news. The last motivational category was the entertainment motivation. This motivation includes users who are moved to use Twitter as a habitual pastime, a form of entertainment, and as a way to escape everyday life. The four motivational categories include all nine motivations from Smock, Ellison, Lampe and Wohn (2011), but are applied to the understudied social network Twitter.

The study focused on University of Alabama students because they fit the demographics of a prime Twitter user (Smith & Brenner, 2012). Students at The University of Alabama were in close proximity to the tornado. Students were recruited to participate in the survey through The University of Alabama's Institute of Communication and Information Research (ICIR). The survey was placed in the ICIR study bank where students at The University of Alabama were recruited to take the survey. Using the ICIR allowed teachers to offer credit for students who participate in studies. The teachers directed his or her students to the research study bank. From there, the students were able to choose this study's survey and participate in it. The researcher also utilized snowball sampling research methods. This method was chosen because the researcher was still a student at The University of Alabama and connected with other students on social networking sites who fit the research criteria. The survey was promoted through the

researcher's Facebook and Twitter accounts. Facebook 'friends' and Twitter 'followers' were invited to pass the survey on to individuals that fit the sample criteria.

The researcher also used an email campaign and emailed more than 340 teachers on campus. The teachers were invited to send the survey out to their students. Five teachers offered students extra credit if they participated in the survey. No students were forced to take the survey. Students were allowed to opt out of the survey at any time for any reason without consequence. Students were only given extra credit one time even if they were offered credit in multiple classes. This helped deter students from taking the survey multiple times.

The credit incentive increased response rates and helped the researcher find a sufficient amount of data. The survey was available for five weeks. The University of Alabama has approximately 31,000 students on campus ("Quick facts: demographics," 2012). According to Raosoft's sample size calculator, to have a 95% confidence level, a sample around 380 is necessary ("Sample size calculator," 2004). This survey reached more than 600 students. By offering an incentive, the researcher was able to find an adequate number of participants.

Once the researcher received the survey data, descriptive statistics were used to get a better understanding of the participant population. Then the researcher used mixed design ANOVA to study the significance of the user's motivations and his or her Twitter activity during the warning, impact and recovery stage. Participants were labeled high, medium, or low users depending on how much they were motivated by one of the four motivations. High motivated individuals were students who scored between 4-5 on the motivation score. Medium motivated users had motivation scores between 3 and 3.99. Low motivated individuals scored below 3. The high, medium, and low respondents of each motive were compared to each stage using a mixed design ANOVA. The ANOVA brought to light significant findings among the individuals

motivated and their disposition to use Twitter during the various stages. The last research question was answered by comparing means of Twitter use during each stage.

Although this study only scratches the surface of Twitter use during an emergency, the research leads to a better understanding of crisis communication; specifically, how the public participates in disaster communication through Twitter. The survey addresses motivations as well as how Twitter was used during a tornado by questioning students living near the disaster area. The results from this research will open the doors to future research into Twitter and all social network use during an emergency. In the next chapter, results from the survey will be analyzed, as well as a discussion of what the results mean for the future of social media and crisis communication research.

## Results

Participants were invited to take a short survey over a 35-day span during March 2012 and the first week of April 2012. It was administered nearly a year after the April 27 disaster. By the end of the 35 days, 580 surveys were completed. The survey respondents were made up of both males (21%) and females (79%). Of the University of Alabama campus, females make up 54% of the student body ("Quick facts: demographics", 2012). The majority of participants were Caucasian (81%) followed by African American (11%), and Hispanic (3%). The individuals surveyed were almost evenly distributed among freshmen (18%), sophomore (27%), junior (23%), senior (21%), and graduate (10%) standing. Of those surveyed, a majority used Facebook (96%) and/or Twitter (82%).

The reasons to join Twitter varied among the individuals, but most participants cited friend/ family suggested (61%) as the reason they joined. Individuals also joined Twitter to stay informed (35%) and to follow influential figures (31%). Of the individuals surveyed, 31% joined Twitter after April 27, 2012.

Twitter scores were taken on a five-point scale, where "one" represented using Twitter never and "five" represented using Twitter very often. Twitter was used during each stage with a mean varying between 2.56-2.79. This means that on average, over the three stages of disaster, Twitter was used rarely to sometimes. Twitter was never the most used instrument during the natural disaster. During the warning stage, 76% of individuals found their information from the TV. The next largest segment (66%) used 'word of mouth' to gather information. Twitter was

the fifth largest instrument used by students to find information during the warning stage (37% of people surveyed used Twitter during the warning stage).

The impact stage showed an increase of students gathering information. The majority of students (77%) used 'word of mouth' as a way to find information about the storm after it hit Tuscaloosa. Social networks (not including Twitter) were the second largest tool people used (68%). Again, Twitter was the fifth most used way of finding information. The individuals who used Twitter increased from 37% to 50% during the impact stage.

The recovery stage saw an increase of individuals using the TV (86%), social networks (77%) and 'word-of-mouth' (74%) to gather information, but the percentage of individuals using Twitter (50%) during that stage remained the same.

### **Correlations**

Before the researcher ran analysis on the data, it was important to condense motivations variables to produce motivation scores. These scores would help reflect how motivated the participants were. The participants' motivations were calculated using 18 questions to gauge the use of four motivations. The results from these questions were separated based upon which motivation they represented. Two questions studied how socially motivated the individuals were and another two questioned how much they were motivated by a status seeking need. The entertainment motivation was measured with eight questions and the information motivation with six.

To make the data easier to analyze, motivation questions were collapsed together to create motivation scale scores. Before the questions could be collapsed, it was important for the researcher to check the correlation of each motivation questioned. The researcher used Cohen's (1988) guidelines to decide if the correlations were large enough. In Cohen's guidelines, large



correlations are labeled as any correlation with  $r = .50$  to  $r = 1$ . For this study, if the correlation was larger than  $r = .45$ , that variable was included in the motivation scale score.

The first correlation tested the two variables that were used to measure an individual's social motivation. Using a Cronbach's alpha coefficient, the motivation questions were tested for reliability. The social motivation had a Cronbach's alpha coefficient of .843. Missing cases were excluded pairwise. After using Pearson product-movement correlation coefficient, it was discovered the social motivation's two variables had a strong positive correlation ( $r = .732, n = 575, p < .0005$ ). The two social motivation questions were collapsed to create a social motivation score.

The entertainment motivation consisted of eight different variables. The motivations had a Cronbach's alpha coefficient of .932. Again the researcher used Pearson product-movement correlation to test the strength of the eight correlations. The analysis revealed that seven of the eight variables had large correlations  $r = .573$  or higher. One variable had medium sized correlation (EntM2/EntM8  $r = .434, n = 570, p < .0005$ ). EntM2 reflects the question that asks participants if they use Twitter to look up information about brands. EntM8 asks if the participant uses Twitter to pass the time. Using Twitter to follow brands and to pass the time did not have a high correlation with each other. Since the EntM2 variable had a correlation below  $r = .45$ , the variable was discarded and the other variables left were collapsed to create a strong entertainment motivation scale.

Correlations were next tested between the two status motivation variables. Again, the missing cases were excluded pairwise and a Pearson product-movement correlation coefficient was used. The first status motivation question and the second status motivation question produced a strong positive correlation ( $r = .565, n = 570, p < .0005$ ). The status variables were

collapsed to create a status motivation score. The motivations had a Cronbach's alpha coefficient of .721.

The last correlation measured six variables that created the information motivation scale score. Each motivation was tested against each other. The motivations had a Cronbach's alpha coefficient of .897. Just as with the other motivations, using a Pearson- product movement correlation coefficient, all the motivations had a correlation of  $r = .47$  or higher. Some motivations were more strongly correlated than others. All the information motivation correlations are illustrated in Table 1.

Table 1

*Correlations Information Motivations Variables*

		Information Motivations					
		InfoM1	InfoM2	InfoM3	InfoM4	InfoM5	InfoM6
Information Motivation	Info1	Pearson					
	Correlation	1	.648	.530	.727	.644	.483
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	574	571	570	570	569	567
	Info2	Pearson					
	Correlation	.648	1	.563	.632	.623	.496
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	571	574	570	570	570	569
	Info3	Pearson					
	Correlation.	.530	.563	1	.478	.545	.470
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	570	570	573	569	568	566
	Info4	Pearson					
	Correlation	.727	.632	.478	1	.721	.515
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	570	570	569	574	572	571
	Info5	Pearson					
	Correlation	.644	.623	.545	.721	1	.744
Sig. (2-tailed)	.000	.000	.000	.000		.000	
N	569	569	568	572	573	571	
Info6	Pearson						
Correlation	.483	.496	.470	.515	.744	1	
Sig. (2-tailed)	.000	.000	.000	.000	.000		
N	567	567	567	571	571	571	

All motivations were strongly correlated except for four correlations between InfoM1/InfoM6, InfoM2/InfoM6, InfoM3/InfoM4, and InfoM3/InfoM6. Those motivations had medium correlations. The medium correlations will be included in the analysis because they all had a correlation above  $r = .45$ .

### **Mixed Design ANOVA**

A majority of individuals who used Twitter around the time of the tornado were most likely users who already visited Twitter at least once a day (68%). By using a mixed design ANOVA the researcher compared Twitter use during the warning, impact and recovery stages of the tornado disaster. For the first four research questions, the researcher used a mixed design ANOVA to discover which stage individuals motivated by a particular need used Twitter most.

To conduct this analysis, the researcher collapsed Twitter use during each stage. Each stage asked three questions about Twitter use. The first question examined how often the individual used Twitter during that stage. The next question asked how often the individual sent original Tweets. The last question asked how often the user retweeted information. The researcher used a Pearson product-movement correlation for each stage. Missing cases were excluded pairwise. For the warning stage, each question about Twitter use yielded a significant strong correlation  $r = .804$  or higher (WTU/WOT  $r = .872, n = 579, p < .0005$ ) (WTU/WRT  $r = .804, n = 579, p < .0005$ ) (WOT/WRT  $r = .820, n = 579, p < .0005$ ). The impact stage also produced significant strong correlations of  $r = .836$  or higher (ITU/IOT  $r = .836, n = 574, p < .0005$ ) (ITU/IRT  $r = .836, n = 573, p < .0005$ ) (IOT/IRT  $r = .853, n = 572, p < .0005$ ). The recovery stage has significant positive results as well. The correlations for this stage were the strongest with  $r = .876$  or higher (RTU/ROT  $r = .915, n = 575, p < .0005$ ) (RTU/RRT  $r = .876, n = 570, p < .0005$ ) (ROT/RRT  $r = .891, n = 572, p < .0005$ ). Because each stages' Twitter use

questions had strong correlations, the researcher was able to collapse the Twitter use questions to create a warning, impact and recovery stage Twitter use score. This score was used as the Twitter variable in the mixed design ANOVA analysis.

To answer the research questions using a mixed design ANOVA, three variables are necessary for this analysis. The first two variables are categorical independent between-subjects variables. Taking each motivation score and grouping scores into low, medium and high motivation categories created the first variable. For instance, individuals who scored between 0 and 2.99 on their social motivation score were labeled as low motivated. Individuals who scored between 3 and 3.99 were medium motivated. Lastly, those who scored between 4 and 5 were high motivated by the social motivation. The second categorical independent between subjects variable is the three stages of warning, impact, and recovery. The third variable needed for the analysis was one continuous dependent variable. Twitter use scores during the three stages served as the dependent variable for this study.

## **Motivations to Tweet**

### **Social motivation**

The first research question asks at which stage Twitter users were motivated by the need for socialization most likely to tweet. To answer this question, a mixed design ANOVA was used to analyze the relationship between those who were motivated by the need to socialize and their Twitter use during the warning, impact and recovery stages. Subjects were divided into high, medium, and low motivated groups based on their scores on the social motivation scale (hi  $n = 236$ , med  $n = 152$ , lo  $n = 168$ ). There was a significant main effect for time, Wilks'  $\lambda = .909$ ,  $F(2, 552) = 27.62$ ,  $p < .000$ . This effect for time is a moderate effect with the partial eta squared = .091. The results showed that over the three stages, Twitter use increased. There was also a

main effect found for social motivation  $F(2, 553) = 167.81, p < .000$ . This effect showed that the more motivated someone was by the need for socialization, the more they tweeted. The effect for social motivation was a large effect with the partial eta squared = .378. There was a small but significant interaction effect between time and social motivation, Wilks'  $\lambda = .974, F(4, 1104) = 27.62, p = .006$ , partial eta squared = .013.

The small interaction between time and social motivation was further investigated to examine the simple effects. There were significant simple effects found for the pairwise comparisons of the social motivation measure. The results can be seen in Table 2. All interactions between the motivation categories were significant. Each motivation category had significantly different means (Lo motivated  $M = 1.45$ , Med motivated  $M = 2.86$ , Hi motivated  $M = 3.42$ ).

Table 2

*Pairwise Comparison of Simple Effects for Social Motivation Categories*

Social Grp (a)	Social Grp (b)	Mean Diff. (a-b)	Std. Error	Sig.	95% CI
Lo	Med	-1.410	.121	.000	[-1.647, -1.173]
	Hi	-1.975	.109	.000	[-2.189, -1.761]
Med	Lo	1.410	.121	.000	[1.173, 1.647]
	Hi	-.566	.112	.000	[-.786, -.345]
Hi	Lo	1.975	.109	.000	[1.761, 2.189]
	Med	.566	.112	.000	[.345, .786]

The next simple effect that was examined was time. Again, all pairwise comparisons comparing Twitter use over the three time periods were significant. These results can be seen in Table 3. The results conclude that Twitter use continued to increase over the three time periods

for those who had a social motivation (warning stage  $M = 2.48$ , impact stage  $M = 2.56$ , recovery stage  $M = 2.69$ ).

Table 3

*Pairwise Comparison of Social Motivation Simple Effects for Time*

Time (a)	Time (b)	Mean Diff. (a-b)	Std. Error	Sig.	95% CI
Warning Stage	Impact Stage	-.096	.036	.008	[-.167, -.025]
	Recovery Stage	-.212	.031	.000	[-.273, -.152]
Impact Stage	Warning Stage	.096	.036	.008	[.025, .167]
	Recovery Stage	-.117	.027	.000	[-.170, -.063]
Recovery Stage	Warning Stage	.212	.031	.000	[.152, .273]
	Impact Stage	.117	.027	.000	[.063, .170]

The next pairwise comparison compared high, medium, and low motivated groups to each other during the three stages. All interactions were significant  $p < .0005$ . Results can be examined in Table 4.

The analysis was conducted to find out at which stage individuals were motivated by the need to socialize most likely to tweet. From the analysis it is understood that those motivated by the need to socialize were tweeting more during the recovery stage. Twitter use increased over the three stages. Individuals who were categorized as medium and high- motivated reported on average using Twitter "sometimes" during the recovery stage (med  $M = 3.01$ , hi  $M = 3.58$ ). The breakdown of Twitter use by social motivation group and disaster stage can be seen in Table 5.

Table 4

*Pairwise Comparison of Motivation Group and Time*

Time	Social Grp (a)	Social Grp (b)	Mean Diff (a-b)	Std. Error	Sig.	95% CI
1	Lo	Med	-1.289	.123	.000	[-1.527, -1.044]
		Hi	-1.890	.111	.000	[-2.107, -1.673]
	Med	Lo	1.286	.123	.000	[1.044, 1.527]
		Hi	-.605	.114	.000	[-.829, -.381]
	Hi	Lo	1.890	.111	.000	[1.673, 2.107]
		Med	.605	.114	.000	[.381, .829]
2	Lo	Med	-1.414	.138	.000	[-1.686, -1.143]
		Hi	-1.942	.125	.000	[-2.187, -1.697]
	Med	Lo	1.414	.138	.000	[1.143, 1.686]
		Hi	-.528	.128	.000	[-.780, -.276]
	Hi	Lo	1.942	.125	.000	[1.697, 2.187]
		Med	.528	.128	.000	[.276, .780]
3	Lo	Med	-1.529	.127	.000	[-1.779, -1.279]
		Hi	-2.094	.115	.000	[-2.319, -1.868]
	Med	Lo	1.529	.127	.000	[1.279, 1.779]
		Hi	-.565	.118	.000	[-.797, -.332]
	Hi	Lo	2.094	.115	.000	[1.868, 2.319]
		Med	.565	.118	.000	[.332, .797]

**Entertainment motivation**

The second research question asks at which stage Twitter users were motivated by the need for entertainment most likely to tweet. As with the first research question, the researcher used a mixed design ANOVA to analyze the relationship between those who were motivated by entertainment and their Twitter use during the warning, impact, and recovery stages. Again subjects were divided into three groups based on their level of entertainment motivation (hi  $n = 144$ , med  $n = 208$ , lo  $n = 194$ ). There was a significant main effect for time, Wilks'  $\lambda = .90$ ,  $F(2, 542) = 30.04$ ,  $p < .000$ . This effect for time is a moderate to large effect with the partial eta squared = .1. There was also a main effect found for the entertainment motivation,  $F(2, 543) = 138.98$ ,  $p < .000$ . This effect showed that the more motivated someone was by the need for

entertainment, the more he or she tweeted. The effect for entertainment motivation was a large effect with the partial eta squared = .339. There was a significant but small interaction effect between time and entertainment motivation, Wilks'  $\lambda = .979$ ,  $F(4, 1084) = 2.93$ ,  $p = .020$ , partial eta squared = .011.

A pairwise comparison was used to examine the interactions between the entertainment motivation and time. There were significant simple effects found for the comparisons of the entertainment motivation. The results can be seen in Table 6. All interactions between the motivation categories were significant. As the motivation for entertainment grew, so did Twitter use (lo motivated  $M = 1.65$ , med motivated  $M = 3.09$ , hi motivated  $M = 3.53$ ).

Table 5

*Social Motivation Groups' Mean Scores over Three Stages*

Social Grp.	Time	Mean	Std. Error	95% CI
Lo	1	1.421	.085	[1.255, 1.587]
	2	1.456	.095	[1.269, 1.643]
	3	1.484	.088	[1.312, 1.657]
Med	1	2.706	.089	[2.531, 2.881]
	2	2.871	.100	[2.674, 3.067]
	3	3.013	.092	[2.832, 3.195]
Hi	1	3.311	.071	[3.171, 3.451]
	2	3.398	.080	[3.240, 3.556]
	3	3.578	.074	[3.432, 3.723]

The next simple effect examined was time. Again all pairwise comparisons comparing Twitter use over the three time periods were significant ( $p = .012$  or less). These results can be seen in Table 7. The results conclude that Twitter use continued to significantly increase for those who had an entertainment motivation over the three time periods (warning stage  $M = 2.65$ , impact stage  $M = 2.74$ , recovery stage  $M = 2.87$ ).



Table 6

*Pairwise Comparison of Simple Effects for Entertainment Motivation Categories*

Entertain Grp (a)	Entertain Grp (b)	Mean Diff. (a-b)	Std. Error	Sig.	95% CI
Lo	Med	-1.439	.111	.000	[-1.657, -1.220]
	Hi	-1.884	.123	.000	[-2.125, -1.643]
Med	Lo	1.439	.111	.000	[1.220, 1.657]
	Hi	-.445	.121	.000	[-.683, -.208]
Hi	Lo	1.884	.123	.000	[1.643, 2.125]
	Med	.445	.121	.000	[.208, .683]

Table 7

*Pairwise Comparison of Entertainment Motivation Simple Effects for Time*

Time (a)	Time (b)	Mean Diff. (a-b)	Std. Error	Sig.	95% CI
Warning Stage	Impact Stage	-.092	.036	.012	[-.163, -.020]
	Recovery Stage	-.218	.031	.000	[-.279, -.157]
Impact Stage	Warning Stage	.092	.036	.012	[.020, .163]
	Recovery Stage	-.126	.027	.000	[-.180, -.073]
Recovery Stage	Warning Stage	.218	.031	.000	[.157, .279]
	Impact Stage	.126	.027	.000	[.073, .180]

Table 8 shows the next pairwise comparison that compared high, medium, and low motivated groups to each other during the three stages. All interactions were significant at  $p = .005$  or less.

The analysis was conducted to discover at which stage individuals motivated by the need for entertainment were most likely to tweet. Individuals who were categorized as medium and high motivated both reported on average using Twitter "sometimes" during the impact stage (med  $M = 3.1$ , hi  $M = 3.49$ ) and recovery stage (med  $M = 3.21$ , hi  $M = 3.70$ ). Compared to the

social motivation, individuals motivated by the need for entertainment used Twitter more during the three stages. The analysis also showed that those motivated by the need for entertainment were tweeting significantly more during the recovery stage. The breakdown of Twitter use by entertainment motivation group and disaster stage can be seen in Table 9.

Table 8

*Pairwise Comparison of Motivation Group and Time*

Time	Entertain Grp (a)	Entertain Grp (b)	Mean Diff (a-b)	Std. Error	Sig.	95% CI
1	Lo	Med	-1.342	.113	.000	[-1.564, -1.121]
		Hi	-1.807	.124	.000	[-2.051, -1.562]
	Med	Lo	1.342	.113	.000	[1.121, 1.564]
		Hi	-.464	.123	.000	[-.705, -.223]
	Hi	Lo	1.807	.124	.000	[1.562, 2.051]
		Med	.464	.123	.000	[.223, .705]
2	Lo	Med	-1.462	.126	.000	[-1.709, -1.214]
		Hi	-1.843	.139	.000	[-2.116, -1.571]
	Med	Lo	1.462	.126	.000	[1.214, 1.709]
		Hi	-.382	.137	.005	[-.651, -.113]
	Hi	Lo	1.843	.139	.000	[1.571, 2.116]
		Med	.382	.137	.005	[.113, .651]
3	Lo	Med	-1.512	.118	.000	[-1.744, -1.281]
		Hi	-2.002	.130	.000	[-2.257, -1.747]
	Med	Lo	1.512	.118	.000	[1.281, 1.744]
		Hi	-.490	.128	.000	[-.741, -.239]
	Hi	Lo	2.002	.130	.000	[1.747, 2.257]
		Med	.490	.128	.000	[.239, .741]

**Status seeking motivation**

The third research question (during which stage were Twitter users who were motivated by status most likely to tweet) was analyzed using a mixed design ANOVA examining the status motivation over the three stages. Subjects were divided into three groups based on their level of status-seeking motivation (hi  $n = 50$  med  $n = 114$ , lo  $n = 388$ ). Most of the respondents had a low motivation. There was a moderate, significant main effect for time, Wilks'  $\lambda = .914$ ,  $F(2, 548) =$

25.64,  $p < .000$ , partial eta squared = .086. There was also a main effect found for the status motivation,  $F(2, 549) = 138.67$ ,  $p < .000$ . This effect shows that the more motivated someone was by status seeking, the more they tweeted. The effect for status motivation was a moderate effect with the partial eta squared = .090. There was no significant interaction effect found between time and the status-seeking motivation, Wilks'  $\lambda = .986$ ,  $F(4, 1096) = 1.97$ ,  $p = .098$ . Although Twitter use increased over time, there was no significant difference between use during the three stages. It is no surprise that the interaction was not significant because the effect size was small, partial eta squared = .007. Because the interaction was not significant, pairwise comparisons were not necessary.

Table 9

*Entertainment Motivation Groups' Mean Scores over Three Stages*

Entertain Grp.	Time	Mean	Std. Error	95% CI
Lo	1	1.603	.081	[1.444, 1.763]
	2	1.643	.091	[1.465, 1.821]
	3	1.699	.085	[1.533, 1.866]
Med	1	2.946	.078	[2.791, 3.100]
	2	3.104	.087	[2.932, 3.276]
	3	3.212	.082	[3.051, 3.372]
Hi	1	3.410	.094	[3.224, 3.595]
	2	3.486	.105	[3.280, 3.693]
	3	3.701	.098	[3.508, 3.895]

**Information Motivation**

The last motivation that was examined in this research was the information motivation. Just like the previous three motivations, a mixed design ANOVA was used to analyze the relationship between those who were motivated by the need for information and their Twitter use during the warning, impact and recovery stages. Survey participants were placed in categories

based on their motivation scores (hi  $n = 81$ , med  $n = 229$ , lo  $n = 231$ ). There was a significant main effect for time, Wilks'  $\lambda = .905$ ,  $F(2, 537) = 28.21$ ,  $p < .000$ . This effect for time is a moderate effect with the partial eta squared = .095. The results showed that over the three stages, Twitter use increased. There was a main effect found for information motivation,  $F(2, 538) = 137.01$ ,  $p < .000$ . This effect explained that the more motivated someone was by the need for information, the more they tweeted. The effect for information motivation was a large effect with the partial eta squared = .337. There was a small but significant interaction effect between time and social motivation, Wilks'  $\lambda = .975$ ,  $F(4, 1074) = 3.39$ ,  $p = .009$ , partial eta squared = .012.

The small interaction between time and information motivation was further investigated to examine the simple effects. There were significant effects found for the pairwise comparisons of the information motivation measured. The results can be seen in Table 10. All interactions between the motivation categories were significant  $p = .003$  or less. The more individuals are motivated by the need for information, the more they tweet (lo motivated  $M = 1.78$ , med motivated  $M = 3.24$ , hi motivated  $M = 3.68$ ).

Table 10

*Pairwise Comparison of Information Motivation Simple Effects for Motivation Categories*

Info Grp (a)	Info Grp (b)	Mean Diff. (a-b)	Std. Error	Sig.	95% CI
Lo	Med	-1.459	.104	.000	[-1.663, -1.255]
	Hi	-1.896	.144	.000	[-2.178, -1.614]
Med	Lo	1.459	.104	.000	[1.255, 1.663]
	Hi	-.437	.144	.003	[-.719, -.154]
Hi	Lo	1.896	.144	.000	[1.614, 2.178]
	Med	.437	.144	.003	[.154, .719]

The next simple effect that was examined was time. Again all pairwise comparisons were significant. These results can be seen in Table 11. The results conclude that Twitter use continued to significantly increase for those who had an information motivation over the three time periods (warning stage  $M = 2.79$ , impact stage  $M = 2.88$ , recovery stage  $M = 3.02$ )

Table 11

*Pairwise Comparison of Information Motivation Simple Effects for Time*

Time (a)	Time (b)	Mean Diff. (a-b)	Std. Error	Sig.	95% CI
Warning Stage	Impact Stage	-.096	.040	.017	[-.175, -.017]
	Recovery Stage	-.238	.035	.000	[-.306, -.170]
Impact Stage	Warning Stage	.096	.040	.017	[.017, .175]
	Recovery Stage	-.142	.031	.000	[-.202, -.081]
Recovery Stage	Warning Stage	.238	.035	.000	[.170, .306]
	Impact Stage	.142	.031	.000	[.081, .202]

The next pairwise comparison compared high, medium, and low motivated groups to each other during the three stages. All interactions were significant  $p = .015$  or less. Results can be examined in Table 12.

The analysis was conducted to find out at which stage individuals who were motivated by the need for information were most likely to tweet. The analysis showed those motivated by the need for information were tweeting more during the recovery stage. During all three stages, medium and highly motivated individuals on average tweeted ‘sometimes.’ The use of Twitter by both categories increased over the three disaster stages. The highest Twitter use of medium ( $M = 3.39$ ) and high ( $M = 3.85$ ) users was seen in the recovery stage. The breakdown of Twitter use by information motivation group and disaster stage can be seen in Table 13.

Table 12

*Pairwise Comparison of Motivation Group and Time*

Time	Info Grp (a)	Info Grp (b)	Mean Diff (a-b)	Std. Error	Sig.	95% CI
1	Lo	Med	-1.337	.106	.000	[-1.546, -1.128]
		Hi	-1.792	.147	.000	[-2.081, -1.503]
	Med	Lo	1.337	.106	.000	[1.128, 1.546]
		Hi	-.455	.147	.002	[-.744, -.166]
	Hi	Lo	1.792	.147	.000	[1.503, 2.081]
		Med	.455	.147	.002	[.166, .744]
2	Lo	Med	-1.484	.117	.000	[-1.714, -1.254]
		Hi	-1.882	.162	.000	[-2.200, -1.563]
	Med	Lo	1.484	.117	.000	[1.254, 1.714]
		Hi	-.397	.162	.015	[-.716, -.079]
	Hi	Lo	1.882	.162	.000	[1.563, 2.200]
		Med	.397	.162	.015	[.079, .716]
3	Lo	Med	-1.556	.109	.000	[-1.771, -1.341]
		Hi	-2.014	.152	.000	[-2.311, -1.716]
	Med	Lo	1.556	.109	.000	[1.341, 1.771]
		Hi	-.458	.152	.003	[-.756, -.160]
	Hi	Lo	2.014	.152	.000	[1.716, 2.311]
		Med	.458	.152	.003	[.160, .756]

Table 13

*Information Motivation Groups' Mean Scores over Three Stages*

Social Grp.	Time	Mean	Std. Error	95% CI
Lo	1	1.743	.075	[1.596, 1.890]
	2	1.760	.083	[1.598, 1.923]
	3	1.834	.077	[1.682, 1.986]
Med	1	3.080	.075	[2.932, 3.228]
	2	3.245	.083	[3.082, 3.407]
	3	3.390	.078	[3.238, 3.542]
Hi	1	3.535	.127	[3.286, 3.784]
	2	3.642	.139	[3.368, 3.916]
	3	3.848	.130	[3.592, 4.104]

### Motivations that produced the most Twitter use

To answer the last research question "Which motivation produced the most Twitter use?" the researcher collapsed the motivation scores for the social, entertainment, and information motivation. The status seeking motivation was not used because its results were not found significant over the three stages. Unlike collapsing the motivations into high, medium and low motivation, the researcher collapsed the scores to reflect whether an individual was motivated or not. If an individual scored a three or higher on the motivation scale, they were deemed motivated by that particular motivation. The researcher also collapsed the warning stage Twitter use, impact stage Twitter use and recovery stage Twitter use to create a general Twitter use score for the individual. General Twitter use scores were compared between individuals who were motivated and those who were not. The entire mean comparisons can be examined in Table 14-16. The results show that the information motivation produced the most Twitter use, but the entertainment motivation and social motivation were not far behind.

Most results from this study were significant and shed more light on the use of social media during natural disasters. In the next section, the researcher will explain what these findings mean for disaster communication.

Table 14

#### *Social Motivated Users Mean Score*

Social Motivation	Mean	N	Std. Deviation
Yes	3.2073	388	1.20371
No	1.4537	168	.81753
Total	2.6775	556	1.36420

Table 15

*Entertainment Motivated Users Mean Score*

Entertain Motivation	Mean	N	Std. Deviation
Yes	3.2693	352	1.00865
No	1.6483	194	1.20371
Total	2.6933	546	1.36834

Table 16

*Information Motivated Users Mean Score*

Info Motivation	Mean	N	Std. Deviation
Yes	3.3523	310	1.16839
No	1.7792	231	1.05320
Total	2.6806	541	1.363389



## **Discussion**

April 27, 2011, is a day that will live forever in the minds of many college students who attended The University of Alabama in the Spring of 2011. Students were thrown into a situation that many had never experienced. Students were without power and cell phone service for hours to days after the storm. The research studied how they used Twitter during this time. The results show that no matter what motivated an individual or how motivated they were, Twitter use increased over the warning, impact and recovery phase. The research also addresses what motivated the students to use Twitter during that time.

From the results, it is evident that level of motivation and what motivates a person produces significantly different Twitter use. Three of the motivations studied — social, entertainment, and information — showed significantly more Twitter use during the recovery stage compared to the warning and impact phase. The status-seeking motivation did not show any significant interaction results between the motivation and time of Twitter use. Other survey questions back up these results. When students were asked why they used Twitter during the recovery stage, only 9% selected the status motivation option "pass on information about volunteer opportunities." During the recovery stage, students reported using Twitter to find ways to help family, friends, and their community (20%), to get information about recovery efforts (18%), and to divert their attention (12%).

The last research question asked which motivation produced the most Twitter use. Results show that the social, entertainment and information motivation produce roughly the same amount of Twitter use. The research studied Twitter use at each stage and asked individuals the

reason they used Twitter during that stage. During the warning stage, 44% of individuals surveyed used Twitter to pass the time. This suggests that during the warning stage, users were motivated by entertainment. After the storm and during the impact stage, individuals were using Twitter to find updates about the storm (30%), suggesting they were satisfying an information motivation. Social, information and entertainment motivations were used during the recovery stage. As previously mentioned, students were using Twitter to find ways to help, gather information about recovery efforts and to divert their attention.

From the results, those motivated by a status-seeking need are not using Twitter as much during a disaster. This could be because during a disaster those who are motivated by the status seeking motivation are often exploiters who were not directly affected by the disaster. When participants were asked at each stage how they were using Twitter, the status seeking motivation answers were "Find out the status of school and work," "Report about damage," and "Pass on information about volunteer opportunities." The status seeking motivation answer was consistently chosen the least. The status seeking motivation may not have been used as often during this disaster because students did not look to gain anything out of this disaster. Instead, students were trying to survive it.

Two qualitative questions were asked and shed more light on why the three motivations produced more Twitter use than the status motivation. The two qualitative questions were analyzed following Strauss' four basic guidelines (Berg, 2007). The two questions revealed that many of the students were only able to use their phones after the storm. Before the storm, they were getting storm information by word of mouth. Friends and family were informing students about the pending storm. The students let the information come to them. They were not getting their information from Twitter. Twitter was not a lifeline at that point; instead, it was a means

for entertainment. It was not until after the storm hit that students began actively looking for information. This is likely what led to an increase of Twitter use. Students located in Tuscaloosa during the impact stage used any way possible to see the tornado damage. According to their open-ended questions, students were talking with neighbors, making phone calls and using their phone's Internet capabilities. During that time it may not have been that the students were using Twitter intentionally, but that it was available when they needed it.

The open-ended questions also explained why students motivated by social, entertainment, and information motivation used Twitter more during the recovery stage than the previous two stages. After the tornado hit campus, students were encouraged to leave campus and finals were canceled (Reed, 2011). This was because of power outages on campus and the water not being safe to drink (Brown, 2011). The answers from the open-ended questions explain that many students left campus. They moved from homes and dorms without power to residences that did whether this was staying with friends or moving back home. Because the students now had power and no exams to study for, they were able to spend more time on the Internet. Many of the participants did not always stay home after they moved. After moving, many students came back to volunteer around Tuscaloosa after hearing about ways they could help.

### **Contributions**

This research has set the path for more research into disaster communication and Twitter use. During the three stages, Twitter was never the most used media outlet during the disaster, but it was consistently used. By the impact and recovery stage, 50% of individuals surveyed were using Twitter during the disaster. Twitter was useful even if an individual was not an active user. Even though students were not actively trying to use Twitter specifically, it was one of the easiest ways for students to connect in a world from which they had become unplugged.

This thesis explains that students did not use Twitter during the warning stage as much as they used word-of-mouth. From the open-ended questions, this thesis learned that many students learned about the incoming storm from their parents or other word-of-mouth sources. For emergency agencies to get warning alerts out, Twitter should not be used alone during the warning stage. Emergency response communicators should feel confident about using Twitter to disseminate information during a disaster and after the disaster occurs. Students were looking for information on Twitter after the tornado hit.

From the open-ended questions it was understood that many students had to relocate, often more than once, after the storm (moving to houses with power, moving home, moving to volunteer). By using Twitter and following other social media updates by emergency agencies, students were able to stay connected with updates to find the information they needed. It was an easy way for students to find information no matter where they were located.

Unlike other social media and disaster related studies, this thesis questioned individual's use of social networking to find volunteer opportunities. Because the information was readily available on social networks sites, students spent time volunteering on campus in the aftermath of the storm. Students were free from exams and able to devote time that would have been spent on schoolwork on volunteer efforts instead.

This research also showed that different motivations produce a variety of Twitter use during a natural disaster. Students are motivated differently and, depending on the need they are trying to fulfill, they use Twitter differently during each stage of disaster. For instance, the use of Twitter to satisfy the need for information increased during the impact and recovery stage. This could be because students relied on word of mouth to inform them about the storm. Some students even mentioned that parents were the first to inform them about the storm and that they

would not have known about it otherwise. Communicators should be aware that for these college students, it was not a priority to find information about the storm before it hit, even if it was tweeted out to them.

Emergency agencies should not rely on social media during the warning stage of a disaster. One of the most important points from this study is that college students used word of mouth most during the warning stage of the disaster than they used Twitter. Since the disaster occurred over a year ago, students are taking active roles by constantly informing themselves about the possibility of bad weather. Instead of waiting for a disaster to rouse a target into informing themselves about a disaster, communicators should use word-of mouth to get disaster messages across to students. Alerting parents to call students may be more affective than tweeting a warning to a complacent target.

### **Limitations**

Like all research studies, limitations do occur. This research, although it is insightful, could have produced more accurate results if it had been conducted within six months of the natural disaster. Many of the students who were on campus during the tornado graduated before the survey was distributed. Because these students were not on campus, they were not contacted for this research. By conducting the research earlier, open-ended answers may have been more detailed and more accurate.

To gain a better insight to the significant results, it would have been advantageous for the researcher to also conduct in-depth interviews. With interviews, a clearer picture could be created to better define who had a high social, status, information, or entertainment motivation. The researcher could have used a survey in the beginning and then conducted interviews based on those results. The researcher could have gained an even better understanding of how those

individuals are motivated and why they are motivated. In-depth interviews may help the researcher better understand their Twitter use.

The research is also limited due to its specialized population. The results only reflect one college campus's student body during one type of disaster. The results cannot be generalized to other populations because this research specifically studied college students. The general adult population would not necessarily behave in the same way as college students. Other populations may be motivated differently and use Twitter in a way unlike the college population that was questioned in this study. In the future, a researcher can gain a better outlook by conducting research on a variety of campuses and populations threatened by natural disasters or non-natural disasters.

The research is also limited due to the type of disaster. Disaster communication is unique based on the disaster type. A tornado sometimes involves little communication during the warning stage, unlike a hurricane, which could be in the warning stage for weeks. For an emergency agency to deliver proper alert messages, each disaster type needs properly tailored messages that correlate with the disaster and the audience it is trying to reach. This research only studied one disaster type and one target audience.

### **Future Research**

In the future, researchers could expand upon the findings of this thesis by studying other college campuses during natural disasters. This research focuses on The University of Alabama student body during a tornado. The results may have been different if a hurricane, fire, or even a non-natural disaster occurred. A greater understanding of the link between natural disasters and social media use could be gained by further investigation. By comparing information use during

natural and non-natural disasters, significant differences for natural disasters could be noticed and addressed. This would enhance communication efforts for future disaster responses.

Because the research confirms that different motivations produce different Twitter use, future research could concentrate on why individuals' motivations affect their social media use during natural disasters. New studies could be conducted that survey a single motivation and its effect on Twitter use. By singling out a motivation, the researcher could learn which emergency messages resonate with the different motivations. Future research on the motivations could also expose additional motivations like fear and a survival motivation that would be special to disaster communication. This would advance the current knowledge of social media use.

Studies should not just stop with a look into natural disasters, political conventions, other disasters and public service notices. In all cases information is necessary and it would be beneficial to note who is delivering the messages and if they are being heard. From this thesis it was noted that not all messages are heard. Twitter research has a promising future and will only create a more efficient communication platform for emergency agencies to use.

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## APPENDIX A

### Survey Questions:

For questions 1-5, reflect back to the week before the tornado hit Tuscaloosa on April 27, 2011.

Answer the following questions about your behavior during that time.

1. During the week before the tornado hit Tuscaloosa, where did you find information about the incoming storm? **Select all that apply.**

- TV
- Online News Sites
- Twitter
- Social Networks (i.e. Facebook, MySpace)
- Newspapers
- Word of Mouth
- Radio
- UA alerts

Other \_\_\_\_\_

2. During the week before the tornado hit Tuscaloosa, how often did you use Twitter?

- Very Often
- Often
- Sometimes
- Rarely
- Never

3. During the week before the tornado hit Tuscaloosa, did you post original tweets?

- Very Often
- Often
- Sometimes
- Rarely
- Never

4. During the week before the tornado hit Tuscaloosa, did you retweet other tweets?

- Very Often
- Often
- Sometimes
- Rarely
- Never

5. During the week before the tornado hit Tuscaloosa, what was your primary reason for using Twitter. **Select one.**

- See what friends and family were doing to prepare for the storm
- Find out the status of work or classes
- Find updates about the storm
- Pass the time
- Did not use Twitter
- Other

For questions 6-10, think back to April 27, 2011 and the first 72 hours (i.e. 3 days) after the tornado.

6. In the first 72 hours after the tornado, where did you find information about the disaster?

**Select all that apply.**

- TV
- Online News Sites
- Twitter
- Social Networks (i.e. Facebook, MySpace)
- Newspapers
- Word of Mouth
- Radio
- UA alerts
- Other \_\_\_\_\_

7. In the first 72 hours (i.e.3 days ) after the tornado, how often did you use Twitter?

- Very Often
- Often
- Sometimes
- Rarely
- Never

8. In the first 72 hours (i.e.3 days ) after the tornado, how often did you post original tweets?

- Very Often
- Often
- Sometimes
- Rarely
- Never

9. In the first 72 hours (i.e.3 days ) after the tornado, how often did you retweet other tweets?

- Very Often
- Often
- Sometimes
- Rarely
- Never

10. In the first 72 hours (i.e.3 days ) after the tornado, what was your primary reason for using Twitter? **Select one.**

- Find updates about the storm destruction
- Let loved ones know you were safe
- Watch videos and look at pictures of the storm
- Report about damage in Tuscaloosa
- Did not use Twitter
- Other \_\_\_\_\_

Following the initial 72 hours, for questions 11-15 think now about the first four weeks after the storm.

11. In the weeks after the storm, where did you find information about the disaster? **Select all that apply.**

- TV
- Online News Sites
- Twitter
- Social Networks (i.e. Facebook, MySpace)
- Newspapers
- Word of Mouth
- Radio
- UA alerts
- Other \_\_\_\_\_



12. In the weeks after the tornado, how often did you use Twitter?

- Very Often
- Often
- Sometimes
- Rarely
- Never

13. In the weeks after the tornado, how often did you post original tweets?

- Very Often
- Often
- Sometimes
- Rarely
- Never

14. In the weeks after the tornado, how often did you retweet other tweets?

- Very Often
- Often
- Sometimes
- Rarely
- Never

15. In the weeks after the tornado, what was your primary reason for using Twitter? **Select One.**

- Pass on information about volunteer opportunities
- Divert your attention away from tornado related topics
- Find information about the recovery efforts

- Find ways to help your family, friends, community (through volunteering, donations, find shelters)
- Did not use Twitter
- Other

For question 16-28 think about your general use of Twitter.

16. How often do you visit Twitter?

- More than 3 Times a Day
- 2-3 Times a Day
- Once a Day
- 2-3 Times a Week
- Once a Week
- Less than Once a Week
- Never

17. Why did you join Twitter? **Select all that apply.**

- Required for a class
- Friend or family suggested
- Teacher or colleague suggested
- To stay informed
- To follow influential figures like athletes, actors, politicians, designers and journalists
- Other \_\_\_\_\_

18. Do you use Twitter to keep in touch with friends?

- Very Often

- Often
- Sometimes
- Rarely
- Never

19. When using Twitter, do you feel like you are part of a community?

- Very Often
- Often
- Sometimes
- Rarely
- Never

20. Do you use Twitter to advance your career opportunities?

- Very Often
- Often
- Sometimes
- Rarely
- Never

21. Do you use Twitter for school-related work?

- Very Often
- Often
- Sometimes
- Rarely
- Never

22. Do you use Twitter to receive information about campus news?

- Very Often
- Often
- Sometimes
- Rarely
- Never

23. Do you use Twitter to pass information (pictures websites, articles, blogs, etc.) to friends?

- Very Often
- Often
- Sometimes
- Rarely
- Never

24. Do you use Twitter to find reviews for other products or services?

- Very Often
- Often
- Sometimes
- Rarely
- Never

25. Do you use Twitter to find the most recent local, national or international news?

	Very Often	Often	Sometimes	Rarely	Never
Local	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
National	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
International	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. Do you use Twitter for entertainment?

- Very Often
- Often
- Sometimes
- Rarely
- Never

27. How often do you use Twitter to find information about:

	Very Often	Often	Sometimes	Rarely	Never
Brands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Celebrities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sports	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Movies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Television	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. Do you use Twitter to pass the time?

- Very Often
- Often
- Sometimes
- Rarely
- Never

29. Do you use any of the following social networking sites? **Select all that apply.**

- Twitter
- MySpace
- LinkedIn

- Google+
- Friendster
- Facebook
- Other

30. Were you in Tuscaloosa, Ala. during the April 27, 2011 tornado?

- Yes
- No

31. Did you have a Twitter account before April 27, 2011?

- Yes
- No
- Unsure

32. The next two questions refer to your personal experience with the tornado that occurred in Tuscaloosa on April 27, 2011. In the space below briefly explain your experience that day.

---

---

33. After the storm, what did you do? Were you affected, did you leave your home, did you do nothing, did you help volunteer or did you do something else?

---

---

34. What is your gender?

- Male
- Female

35. What is your race?

- White/Caucasian
- African American
- Hispanic
- Asian
- Native American
- Pacific Islander
- Other \_\_\_\_\_

36. What is your major?

---

37. What year are you?

- Freshman
- Sophomore
- Junior
- Senior
- Graduate Student

38. Which state do you consider your home state?

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If not from the United States, what country do you consider your home country?

---



## APPENDIX B

### IRB Approval Letter:

Office for Research  
Institutional Review Board for the  
Protection of Human Subjects

THE UNIVERSITY OF  
**ALABAMA**  
R E S E A R C H

February 29, 2012

Elizabeth Maxwell  
College of Communication and Information Sciences  
Box 870172

Re: IRB#: 12-OR-079 "Twitter Motivations Thesis Research"

Dear Ms. Maxwell:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your application has been given expedited approval according to 45 CFR part 46. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies


Your application will expire on February 28, 2013. If your research will continue beyond this date, complete the relevant portions of the IRB Renewal Application. If you wish to modify the application, complete the Modification of an Approved Protocol Form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, complete the appropriate portions of the Request for Study Closure form.

Please use reproductions of the IRB approved stamped consent forms to obtain consent from your participants.

Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Sincerely,

  
Carpiantato T. Myles, MSM, CIM  
Director & Research Compliance Officer  
Office of Research Compliance  
The University of Alabama



358 Rose Administration Building  
Box 870127  
Tuscaloosa, Alabama 35487-0127  
(205) 348-8461  
FAX (205) 348-7189  
TOLL FREE (877) 820-3066

### Consent form

You are invited to take part in a study. This study is called "Twitter Motivations." Elizabeth Maxwell, a Masters student at the University of Alabama, is conducting the study. Dr. Horsley, assistant professor in the Advertising and Public Relations Department at the University of Alabama, is supervising the research. The researcher is not receiving any payment for the research being conducted.

The purpose of this research study is to explore what motivates people to use the social network Twitter during a natural disaster. The researcher hopes to help emergency services and other companies that use social networks understand what motivates individuals to use Twitter during natural disasters.

There will be about 400 other participants who will complete this study. You have been invited to take this survey because you were in Tuscaloosa or a student at the University of Alabama during April 2011. You must be 19 or older to participate. If you meet the criteria and agree to be in this study you will complete an online survey that questions your motivations to use Twitter. The survey takes approximately 15 minutes.

The survey will not cost you anything. The researcher is not responsible for providing compensation to students. Some participants may receive class credit for their participation if their teacher has agreed to assign credit and informed them about the class credit opportunity. If you are unsure if your instructor is giving class credit for participation, please ask your instructor.

The survey will be available online. This allows you to take the survey wherever you feel comfortable so that your privacy will be protected. Your results will remain confidential. The data will be reported in aggregate form. Participants who are receiving class credit will be asked to include their name, and class information. This information will be momentarily linked to results, but will only be used for reporting class credit to instructors. After the information has been reported, it will be removed from the results. The alternative to being in this study is to not participate. Participation is voluntary. There are no foreseen risks involved, but if at any point during this study you become uncomfortable with the information or any of the questions asked you may opt out of the survey without penalties.

The University of Alabama Institutional Review Board ("the IRB") is the committee that protects the rights of people in research studies. The IRB may review study records from time to time to be sure that people in research studies are being treated fairly and that the study is being carried out as planned.

If you have questions, concerns, or complaints about the study right now, please ask them. If you have questions, concerns, or complaints about the study later on, please contact Elizabeth Maxwell at 205-563-1459 or [emarie.maxwell@gmail.com](mailto:emarie.maxwell@gmail.com). You can also contact Dr. Suzanne Horsley at 205-348-8304 or [horsley@apr.ua.edu](mailto:horsley@apr.ua.edu).

UNIVERSITY OF ALABAMA IRB  
CONSENT FORM APPROVED: 0/29/12  
EXPIRATION DATE: 2/28/13

If you have questions about your rights as a person in a research study, call Ms. Tanta Myles, the Research Compliance Officer of the University, at 205-348-8461 or toll-free at 1-877-820-3066.

You may also ask questions, make suggestions, or file complaints and concerns through the IRB Outreach website at [http://osp.ua.edu/site/PRCO\\_Welcome.html](http://osp.ua.edu/site/PRCO_Welcome.html) or email the Research Compliance office at [participantoutreach@bama.ua.edu](mailto:participantoutreach@bama.ua.edu).

After you participate, you are encouraged to complete the survey for research participants that is online at the outreach website or you may ask the investigator for a copy of it and mail it to the University Office for Research Compliance, Box 870127, 358 Rose Administration Building, Tuscaloosa, AL 35487-0127.

I have read this consent form. I have had a chance to ask questions. I agree to take part in it.

“Yes, I agree; I wish to begin the study” (Continue) to start the study.

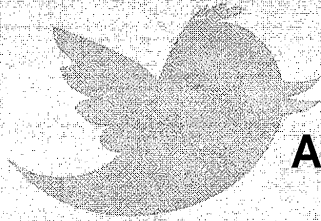
Or

“No, I do not agree; I do not wish to participate” to not participate.

---

UNIVERSITY OF ALABAMA IRB  
CONSENT FORM APPROVED: 2/29/12  
EXPIRATION DATE: 2/28/13

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# Twitter Motivations

Are you a UA student 19 or older?

**You are invited to take a survey.**

The purpose of the survey is to explore your use of Twitter during a natural disaster. Results will help emergency agencies to be more helpful during future disasters.

The survey can be found at  
<http://bit.ly/xOMyXJ>

Available between  
March 1st -April 6th

Allow 15 minutes for survey taking.



Questions or Comments?

Contact

Elizabeth Maxwell at [emarie.maxwell@gmail.com](mailto:emarie.maxwell@gmail.com)

UA IRB Approved Document

Approval date: 2/29/12

Expiration date: 2/28/13

Social Media Recruitment  
**Social media invitations**

Facebook:

Are you a student at the University of Alabama and 19 years or older? If so please take this survey <http://bit.ly/xOMyXJ> about your motivations to use Twitter. This survey is for my thesis research. After taking the survey, feel free to share with your classmates. Thank you for your consideration.

Twitter (140 characters or less):

Are you a student at UA and 19 years or older? If so please take a moment to complete this survey for my thesis research <http://bit.ly/xOMyXJ>

UA IRB Approved Document  
Approval date: 2/29/12  
Expiration date: 2/28/13