

**Fanning the Flames:
An Examination of Uses and Gratifications Sought During the
Gatlinburg Wildfires of 2016**

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ACADEMIC ABSTRACT

This research set out to explore how individuals used Twitter during the Gatlinburg, Tennessee wildfire event of November 2016. More specifically, how and what did people from different geolocations share via Twitter during the crisis event and what gratifications were sought by their use of Twitter. A content analysis was completed on a stratified sample of tweets separated by geographic location. Based on prior uses and gratifications research, tweet and retweet content was coded as informational, social, and/or distractive. Findings from this research showed that individuals tweeted and retweeted at a fairly even rate despite their geographical location and that while information seeking and sharing was an important factor for users, social connectivity was the most important gratification to users during this crisis.

GENERAL ABSTRACT

This paper explored how and why individuals used Twitter during the Gatlinburg, Tennessee wildfire event in November 2016. Tweets from individuals who were in local, regional, and non-local areas were analyzed and coded based on the content of their tweet or retweet. Results from this research showed that the social connection an individual receives from using Twitter was the most important factor for using the service during a crisis situation.

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DEDICATION

To my husband, John,

Thank you...

For not only believing that I could do this but
for pushing me to believe in myself.

Our life together has been one hell of a roller coaster.

I am glad to be riding with you.

To my children, Alice, Benjamin, and Cooper,
You are extraordinary and you can do anything in life.

Be kind to one another,
work hard for what you want to achieve,
and enjoy everything life has to offer.

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INTRODUCTION

Various forms of communication become more prominent during crisis or emergency events, not only for the dissemination of information, but also for the connection of individuals both directly involved and remotely involved. A recent study shows that 62% of people now get their news and information from social media channels rather than from traditional media outlets such as television, radio, and newspapers (Shearer and Gottfried, 2017). This shift to social media for information stems from the speed at which information can be shared via on-line mediums as well as the convenience of access as 77% of Americans now have smartphones and 69% of adults use social media (Smith, 2017). The immediacy of social media makes it an important tool in times of emergencies. This paper examines the use of Twitter by individuals, both local and non-local to the Gatlinburg, Tennessee area, during the wildfire event between November 23 and 29, 2016. The content of tweets and retweets is analyzed through the lens of the uses and gratifications theory to determine the if an individual's proximity to a crisis event changes the gratifications sought in those tweets and what information is rebroadcasted by individuals not directly involved.

BACKGROUND AND CONTEXT

Gatlinburg, Tennessee is a mountainous resort town 39 miles southeast of Knoxville with an estimated resident population of about 4,200 in 2016 (Census.gov, n.d.). However, the number of residents swells during the holidays and summer months due to the number of tourist attractions in the area. Gatlinburg lies on the border of the Great Smoky Mountains National Park (GSMNP) and boasts the only ski resort in the state of Tennessee and many attractions in nearby Pigeon Forge.

On Wednesday, November 23, around 5:30 p.m., GSMNP firefighters hiked the Chimney Tops 2 trail, which is 5.5 miles from Gatlinburg city limits, to find a fire burning that was roughly one and a half acres wide over very rough terrain with many rock outcrops and steep ledges. Due to the nature of the terrain, the GSMNP determined that there was no safe or effective route to fight the fire. Firefighters built a 410-acre containment area where the fire could be managed safely and effectively in accordance with standard firefighter suppression strategy in mountainous terrain (Soehn, 2017). Over the next three days, the fire continued to move down the rocky slopes and by Sunday, Nov. 27 the fire had grown to 35 acres. On Nov. 27, the National Weather Service issued a high wind watch advising that strong winds would be developing the next day, Monday, Nov. 28 (WATE6 News, 2016). As the sun rose on Monday, it was discovered that the winds had caused embers to create smaller spot fires as far as one mile away from the main fire. At that point, smoke was so thick that area schools closed due to air quality issues. Around 11:30 a.m., one of these spot fires was discovered 1.5 miles from the Gatlinburg city boundary. As the smoke increased and the winds picked up, the firefighting helicopters were unable to continue their work fighting the fires. The winds had topped 87 miles per hour and by 5:45 p.m., multiple fires had started within the Gatlinburg city limits. In addition to the spot fires, the forceful winds caused multiple trees and power lines to fall which created additional areas of ignition for additional spot fires. The city was experiencing widespread power outages; two area cell phone towers were destroyed and service was interrupted, causing a near total infrastructure failure (WATE6 News, 2016).

Voluntary evacuation orders began at 6:00 p.m. on Monday, Nov. 28. At approximately 8:00 p.m., Gatlinburg Fire Department Chief Greg Miller noted, “Fire resources became

depleted, the wind driven nature of the fire challenged suppression crews from extinguishing the growing blaze” (WATE6 News, 2016). The total evacuation of the Gatlinburg area was ordered.

News reports from the subsequent days estimated more than 2,400 homes and businesses were damaged or destroyed, 14 people died, and 191 people were treated for injuries. A total of 17,140 acres burned in what officially is called the Chimney Tops No. 2 fire, 10,964 acres of which were in the GSMNP. In the Cobbly Nob fire, which was treated separately, 764 acres burned, 446 acres of which were in the park. Total damages have been estimated to exceed \$500 million and the total cost of fighting of the fires has been estimated at \$8.8 million.

A Twitter account called @GatlinburgTn announced mandatory evacuation for specific areas at 5:14 p.m. on Monday, Nov. 28. Another tweet posted at 6:12 p.m. added the rest of downtown Gatlinburg to the mandatory evacuation order. Tweets from this account continued every 12 hours or so but tweets were merely informational status updates rather than directives or instructions for the community. This account, however, was not a “City, Chamber (of Commerce), or CVB (Convention and Visitors Bureau) hosted Twitter site. We are unaware of who administers that site” said spokeswoman Marci Claude (Jacobs, 2016). No other government agency utilized social media with the intent to share information with the community. Furthermore, Claude said neither the city nor its public safety agencies had any social media accounts when the fire struck the city (Jacobs, 2016).

News reports have conveyed residents’ complaints that they were either not informed or misinformed. One resident is reported to say that he turned on the local radio station to find they were playing music. He called the station and asked to be put on the air to tell people they needed to evacuate (Ahillen, 2017). Another resident barely got out with the clothes on her back saying that there was no one telling her where to go. One person commented that “People were

crying, drivers were sounding their horns, law enforcement officers were screaming at each other” (Jacobs, 2017a). Another person involved in the event said “...the flames were coming down the mountain, it was like the gates of hell had opened” (Jacobs, 2017b). Tennessee Emergency Management Agency spokesman Dean Flener confirmed, “You cannot just tell them (to evacuate.) You have to tell them what to do...People will panic more and you will get people in dangerous situations because you have not told them more” (Hersher, 2016).

The expectation is that the communication infrastructure breakdown during this emergency event prompted individuals to share important, life-saving information via social media. Additionally, individuals in different geographical locations may have different motives for the information they share via social media. The formal communication breakdown that occurred during this emergency event provides an opportunity to study what type of information was being shared via social media and how individuals used such information. Uses and gratifications theory is a useful for such an investigation.

LITERATURE REVIEW

Historical Application of Uses and Gratifications Theory

The uses and gratifications (U&G) theory was developed to analyze the interdependence between media audiences and media systems, specifically how audiences use the information and content produced by the media. Katz, Blumler, and Gurevitch (1974) articulated the theory of uses and gratifications which is based on “the social and psychological origins of needs, which generate expectations of the mass media or other sources, which lead to differential patterns of media exposure (or engagement in other activities), resulting in need gratifications and other consequences, perhaps mostly unintended ones” (Katz, Blumler, and Gurevitch, 1974, p 510).

Basically, individuals have fundamental desire to be connected to someone or something to fulfill an innate need and do so via media consumption (Elliot, 1974).

U&G theory has been used to analyze and understand how people use different types of media to satisfy those specific connection needs. It was originally developed for and used with traditional media such as newspapers, radio, and television. Through the many studies analyzing U&G, researchers have developed countless variables and factors to understand and interpret the different gratifications individuals seek from media.

U&G research has a rich history of application across many different types of media and communication technologies from books and newspapers to radio and television to the home telephone. For example, Elliot and Quattlebaum (1979) explored eight different types of media in terms of the gratifications that are received when used by individuals using questionnaires asking participants to rate need statements on a Likert-type scale. A series of three studies looked at the individual uses and gratifications of television, radio, magazines, newspapers, movies, recorded music, friends, and books. The gratification statements varied greatly from 'keeping up with governmental leaders and actions' to 'relieving tension and loneliness' to simply 'killing time' and 'being entertained'. In general, those seeking information regarding politics or work of the government typically gain such information from newspapers, magazines, television, and radio, in order of popularity. Individuals looking to kill time or be entertained use films, television, and recorded music. The correlation between gratifications statements and media outlets is rather obvious but still a strong confirmation of uses and gratifications theory.

Researchers have also applied the theory of uses and gratifications to many different media communication platforms such as television viewing (Herzog, 1942; McQuail, Blumler and Brown, 2000), pager use (Leung and Wei, 1989), instant messaging services (Quan-Hasse

and Young, 2010), and various social networking sites (Lee and Ma, 2012; Phua, J., Jin, S. V., and Kim, J., 2017; Quinn, 2016; Leung, 2009). Dimmick, Sikand, and Patterson (1994) studied the uses and gratifications of the household telephone in meeting the gratifications of the individual user. The introduction of telephone communication had an immense impact on culture as it fostered a sense of community for individuals despite their being in different geographic locations. Given that telephone use allows the user to be far more interactive than with one-way forms of communication, such as newspapers and television, the analysis of the gratification from telephone use has served as a conduit for the study of many other interactive modes of communication.

Applications of Uses and Gratification Theory on Social and Online Media

Original internet web sites (Web 1.0) allowed only one-way or monologic communication through static web pages. In a sense, website publishers communicated with users as if lecturing. The advent of advanced technology and the subsequent emergence of Web 2.0 (second generation of interactive internet-based applications) there is an increased potential for individuals to connect to one another. Rather than receiving a lecture through static web pages, users engaged collectively in a conversation that lead to dialogic loops (Thackeray, 2008). The descriptive term Web 2.0 gained popularity in the early 2000s as an identifier of the new world wide web. Social media are web-based communication tools that enable people to interact with each other by both sharing and consuming information. The types of gratifications sought and received by an individual user of one-way communication shows a great deal of similarity to users of interactive content.

The explosion of media outlets on communication environment of Web 2.0, has made available countless opportunities to analyze using the U&G framework. Researchers have studied the motivations of social media users in several different settings using a variety of dimensions. There is a great deal of overlap in the related research which emphasizes the strength of the measurements. As can be seen in Table 1, the predominant findings in research of gratifications sought from the use of social and online media are that individuals use these mediums primarily for seeking information, maintaining social connection, and for entertainment or distraction purposes.

Social connection is a very important facet to uses and gratifications research which plays a lead role in the development and extension of other gratifications. Lee and Ma (2012) measured the sharing of content on various social media platforms using a survey and 5-point Likert-type measurement scale asking users to measure their social media usage, intention, and experiences. The identified gratifications from the analysis were: information seeking, socializing, entertainment, and status seeking. The descriptions of these categories were very similar to the gratifications sought from the forms of media previously addressed in this review. Information seeking measured the extent to which the news and information shared via social media provides users with relevant and timely information. Specifically, this variable encompassed: It keeps me up to date on the latest news and events; it is easy to retrieve information when I need it. A second gratification, socializing, measured the degree to which sharing content via social media helps users to develop and maintain relationships with others. Some of the measures in this study were: to keep in touch with people; to exchange ideas with other people. The entertainment value of social media measures just that, whether it serves as a

Table 1. Gratifications sought through use of different media per literature review.

<i>Researcher(s)</i>	<i>Media Form</i>				<i>Other Categories</i>
		<i>Information</i>	<i>Social</i>	<i>Entertainment</i>	
Lee & Ma (2012)	Social Media platforms	✓	✓	✓	Status Seeking
Leung (2009)	User-generated content of online blogs		✓	✓	Recognition, Cognitive
Lin (2002)	Online media early adoption	✓	✓*	✓	Escape, *Interaction
Quinn (2016)	Online Sharing and Privacy Maintenance	✓	✓*	✓	Affect, Voyeur, Habit, Professional use, Escape, *Communication.
Pentina et al. (2016)	Twitter		✓	✓	Professional development, Status maintenance,
Phua, Jin, and Kim (2017)	Twitter	✓	✓*		Passing time, Affection, Fashion, Sharing problems, *Social knowledge
Johnson and Yang (2009)	Twitter	✓	✓		
Chen (2010)	Twitter		✓		
Currie-Mueller (2014)	Twitter	✓			
Lachlan, Spence, Lin, & Del Greco (2014)	Twitter	✓			
Spence et al. (2015)	Twitter	✓			
Mazer et al (2015)	Social Media	✓			
Shaw, Burgess, Crawford, and Bruns (2013)	Twitter	✓			

* signifies term similar to related term, therefore attributed.

means for entertainment or leisure purposes and is further broken down into statements such as: It helps pass time or combat boredom. The final measurement Lee and Ma used was status-seeking which is defined as a measure in which social media usage helps users attain status among other users. Some of the qualifiers for this measurement were: It helps me feel important when sharing news; it helps to look good when sharing news stories. This study found that users with prior social media experience and those who were seeking social gratifications were more likely to share information on social media platforms than those who were simply seeking entertainment or distraction from boredom.

In a similar vein, Leung (2009) explored the gratifications of user-generated content with regards to online blogs. The gratifications they used included similar social aspects but also included other measures focused on cognitive needs. Short for weblog, a blog is a website that is user-generated content that is typically an ongoing chronicle of information which features diary-type commentary and links to other websites (WordPress Codex, 2017). The fundamental basis of a blog is as both an informational platform as well as a social platform for which to share and connect with other users. A telephone survey of 798 internet users using a 5-point Likert-type scale qualified the motivations of individual users and the content they generated via social media into the four following needs: (1) recognition needs, which was elaborated as to establish personal identity, to build confidence, and/or to promote expertise; (2) cognitive needs, which included items such as, to broaden knowledge base and/or to understand events that are happening; (3) social needs, which contained items such as to express feelings, views, thoughts, experiences; and (4) entertainment needs broken down as to pass time and/or because it is entertaining or trendy. Results showed that as the user gained more recognition for their content, the more gratifications they received for sharing said content.

What encourages users to begin to use different forms of media is important. Lin (2002) researched the gratification of early adopters of online media, again using a telephone survey. They used a 5-point Likert-type scale and classified gratifications into the following categories – escape/interaction, information learning, entertainment. The escape/interaction category contained items such as seeking companionship, relieving boredom, and escaping problems. The additional breakdown of the information and entertainment categories were analogous with previous studies. Results from this study showed that the highest rated gratifications for early adoption of online media were escape and informational learning. Interestingly, entertainment gratifications failed to rate as a significant predictor (Lin, 2002).

When it comes to sharing of information online, maintaining privacy is a crucial element. Quinn (2016) identified nine different gratifications: affect, companionship, voyeur, information sharing, habit, entertainment, communication, professional use, and escape. This study utilized a 5-point Likert-type scale to measure data collected from surveys taken by active social media users. Within this study, the gratification definitions are as follows:

- Affect: showing care or concern for others or to express thanks and encouragement;
- Companionship: reducing loneliness and enhance feelings of others’ presence;
- Voyeur: finding information about others; information sharing, telling others about oneself or post useful information;
- Habit: habitual use of social media out of boredom, to pass time or when there is nothing better to do;
- Entertainment: using social media for enjoyment, pleasure, and relaxation;

- communication, keeping in touch with family or distant friends; professional use, for career advancement, such as posting a resume or networking with professional contacts.; and,
- escape, using to escape from everyday concerns or to get away from the task at hand (Quinn, 2016).

Again, many of these gratifications are similar to other studies in name and or in definition. In this study, as strong association was found between online privacy activities and professional use as well as communication and escape. Quinn proposes that users understand the need for privacy when using social media for professional reasons but that there may be a ‘privacy paradox’ in reference to social sharing (Quinn, 2016 p.82). In reference to habitual users, a disconnection between privacy concerns and privacy behaviors occurs thus potentially leading to broader sharing of personal information (Quinn, 2016).

While each of these studies used slightly different variables, each study points to several common types of gratifications sought when using social and online media (Lee and Ma, 2012; Leung, 2009; Lin, 2002; Quinn, 2016). For example, we can see that there is a social aspect that is important to people when using specific forms of online media whereas informational content is the main reason for using other forms of online media. Other studies suggest that there are numerous gratifications users seek for social and online media however, as shown in these breakdowns, there are numerous gratification variables that overlap across various forms of media.

Applications of Uses and Gratification Theory on Twitter

Of the many available social networking sites, Twitter is one of the leaders in both consumer use and researcher studies. Twitter is a free online social network application and real-time communication service with more than 328 million users (Statista, 2017). Users post and exchange information called 'tweets' which are messages of up to 140-characters long and can contain multimedia like photos, videos, quotes, article links and more. Per the Twitter default settings tweets are public, visible to all those who are following the user, and accessible via the web and mobile devices. Settings are available to adjust privacy levels for everything from which users can see certain messages to the availability of the geolocation of the original post. Each tweet can also have replies from other people, creating real-time conversations around specific topics, breaking news and interesting content. Twitter also allows the "following" of other users, which creates an aggregate of information from various users viewable on an individual's home page (Zeevi, 2013).

The use of hashtags, words or phrases prefixed with a "#" sign, on Twitter has become a popular way to categorize keywords or topics and to optimize search functions. Hashtags have become more than just markers for tweets or a way to harness a wider conversation. They are identifiers for users to help cut through the noise, cultivate conversations, and engage each other (Bar-Joseph, 2014). According to Zeevi, "Twitter has been able to completely change the traditional transmission of information and has evolved from more than just a real-time communication tool into one of the world's leading sources of social discovery and newsworthy events." (2013).

Several studies specifically related to Twitter have found gratifications that are similar to those reported by users of other media. Pentina, Basmanova, and Zhang (2014) completed a

study of Twitter motivations and intentions and compared users in the Ukraine and the United States. The findings of this study found that both US and Ukrainian participants used Twitter for professional development, entertainment, status maintenance, and social interaction and exchange. There was an additional emphasis on identity negotiation and self-expression among the Ukrainian participants.

Phua, Jin, and Kim (2017) also explored user gratifications for using various social networking sites, including Twitter, in reference to brand engagement. Using an online questionnaire and a 7-point Likert-type scale, the study used six gratification categories previously used by Quan-Hasse and Young (2010) to analyze Facebook and instant messaging services: passing time, affection, fashion, sharing problems, demonstrating sociability, and improving social knowledge (Phua, Jin, and Kim 2017). The connection of this study with others reviewed is based in the fact that the same user gratifications are seen across the Twitter platform for very different queries.

Johnson and Yang (2009) extended U&G research on Twitter by asking which types of gratifications people seek more than another. They used an online questionnaire to measure the motives of Twitter users and separated them into two broad factors: information motives and social motives. The information category included getting information (defined as facts, links, news, knowledge, ideas), giving and receiving advice, and sharing information with others. The social motive category included such things as entertainment, relaxation, and to keep in touch with others. The study findings showed that informational motives for using Twitter were stronger than social motives.

Going one step further, Chen (2010) used survey results and a 5-point Likert-type scale to deduce that only social motives, i.e. the need for connection, is enough to quantify the degree of

user activity on Twitter. The main finding of this study is that the more time spent on Twitter, the more connected a user feels. This finding supports the significance of social motives as an important user gratification gained from Twitter.

Many studies exploring uses and gratifications, both pre and post Web 2.0, have developed their own terminology for the categorization of gratifications sought by media users. As a result, the list of descriptors is seemingly endless. While each of these studies have labeled the gratification variables using different terminology, the basic categories are similar in definition and scope. In an attempt to update the U&G theory for the 21st Century, Ruggiero (2000) revised the Katz, Blumler, and Gurevitch (1974) original categories into four concise factors: diversion, social utility, personal identity, and surveillance. These clearly envelope the overall motives of gratification seekers. These four factors are identified as “diversion (i.e., as an escape from routines or for emotional release), social utility (i.e., to acquire information for conversations), personal identity (i.e., to reinforce attitudes, beliefs, and values), and surveillance (i.e., to learn about one’s community, events, and political affairs)” (p. 26).

Applications of Uses and Gratification Theory on Twitter in Crisis Situations

The focus of this study is to analyze the motivations of Twitter users during a crisis event. In order to inform this current study, previous research related to how uses and gratifications findings were applied. The following studies used the similar yet a somewhat varied set of terms and definitions to categorize Twitter messages. However, instead of surveys and interviews as used in studies mentioned earlier in this review, these studies used content analysis to code the specific content of tweets and retweets. This method allowed for an objective look at the content of the message. The shifting of focus from analyzing the user

motivations to analyzing the content the user produces changes the discussion to what people share via social media in times of crisis to what motivates them.

Communication in the pre-crisis stage can be just as important as it is during the crisis stage of an event. Currie-Mueller (2014) used the content of tweets regarding a pre-crisis stage of the 2013 Red River flood in North Dakota. In addition to analyzing the content of the tweets, the users were separated into decision-makers (governmental employees or public officials), media outlets, and public. This division of users offered an additional insight on what sources of media is more trusted by users and was clear guidance on which types of users to use in this research. In specific reference to the individual users, Currie-Mueller found that the content of the tweets from the public were primarily driven by the information sharing. Results from a content analysis showed that individuals primarily used Twitter to share information about the oncoming flood at a rate of over 70%, followed by the need to interact with other users. Three of the previously discussed gratification factors were chosen to quantify the content; interactivity, diversion, information sharing, with the addition of promotional information and an additional category of 'other' for tweets that did not fit into the established categories. The results from this study was consistent with Johnson and Yang's (2009) findings that users prioritize information sharing over social needs on Twitter.

Various studies have studied tweets surrounding the landfall of Hurricane Sandy in 2012 (Lachlan, Spence, Lin, & del Greco, 2014; Spence, Lachlan, Lin, & del Greco, (2015). Key findings relevant to U&G research reveal that the number of tweets with informational content started as a majority in the pre-event stage but waned as the storm made landfall. Also noted, as the days passed, the informational content of tweets became more limited and harder to find as it was buried by the emotional display content of fear, dread, sorrow, anger, and anxiety which

increased as the impending storm grew closer (Lachlan et al, 2014; Spence et al, 2015).

Cumulative results from Lachlan et al (2014) showed that people were more inclined to use Twitter emotional release. Of the 1,537 tweets by individuals used in the study, 42.7% were coded as social displays while only 36.0% were coded as containing information concerning the storm and 15.7% total of were jokes or humorous messages (Lachlan et al, 2014).

Figure 1. Sample meme used to express humor



The number of tweets containing humorous content was also an interesting find. Humor is a tool in emotional coping and has a useful place in crisis situations (Meyer, 2000). Figure 1 shows a similar example of a funny meme that circulated the internet during the time of the Gatlinburg fires. The researchers do question, however, if the abundance of humorous tweets diluted the availability of the informational content (Spence et al, 2015).

Mazer et al (2015) analyzed social media use during two active shooter events that occurred on September 30, 2014 at preschool through 12th grade schools, one in Kentucky and one in North Carolina. The content was coded into five categories: detailed information on the event, emotional reaction, personal connections, thoughts and prayers, and call for action. The first category is obviously an informational category with the next three categories easily gathered into social motives category. The call for action is a relatively new phenomenon where users are behaving in a more activist role, calling for specific things to happen. This study showed that in both active shooter incidents, social media contained predominantly more

informational content. However, due to the nature of the crisis, the affect display that was demonstrated is just as important as the information. (Mazer et al, 2015).

Shaw, Burgess, Crawford, and Bruns (2013) examined Twitter use during the Queensland, Australia floods in the summer of 2010-2011. The data was gathered using a specific set of hashtags and the tweet content was sorted into five categories: *Information*, which included instructions, situational information and requests for information, *Media Sharing*, which included news media updates, *Help and Fundraising*, which were stand-alone categories, *Direct Experience*, which was explained as personal narratives and eye witness reports, and *Discussion and Reaction*, which included personal reactions, thanks and gratitude as well as other meta-discussions. These categories differ slightly in definition from other studies in that they were event specific and focused on the recovering from the crisis event rather than general and broad. However, the division into informational or social motives can still be made with these five gratifications. The findings in this study were based upon the strength of local media outlets sharing of information with the use of negotiated hashtags to pinpoint prominent information. While this study focused mainly on the community and their self-negotiation of roles as they shared content with the #qldfloods hashtag, the researchers noted that there was significant potential for collaboration between emergency personnel and crisis communication communities via social media (Shaw, Burgess, Crawford, and Bruns (2013)).

Numerous studies looking at Twitter content in times of crisis or disaster show very strong evidence of the many different motivations for using Twitter and the various gratifications a user seeks, the strongest factors are information seeking or sharing and social connection. As Johnson and Yang (2009) explained, even the connection of new people can fall under the informational motive which confirms Chen's (2010) findings of a strong need for connectedness

among Twitter users. The studies used in this review are not conflicting in as much as they are strengthening of the importance of both information sharing and social connection gratifications via social media.

Retweeting and Proximity as Important Factors for Gratification

The application of the uses and gratifications theory applies to both native/original tweets as well as retweeted/forwarded tweets. As an additional diffusion of a native tweet, a retweet brings the information to a new, broader audience. “[Retweeting is the] Twitter-equivalent to email forwarding where users post messages originally posted by others” (boyd, Golder, & Lotan, 2010, p. 1). The user who is doing the retweeting is validating or challenging the original post and also engaging other readers. The reasons for why individuals retweet posts align with the general motives for why individuals tweet content originally. As such, many of the retweet reasons can be categorized into informational or social motives. There are, however, additional U&Gs that are introduced when discussing retweets only; these motivations are viewed as somewhat selfish factors such as for self-gain (either to gain followers or reciprocity), for saving the tweets for future personal access, or to make one’s presence as a listener visible (boyd, Golder, & Lotan, 2010).

David, Ong, and Legara (2016) analyzed tweets and retweets during and after Super Typhoon Haiyan in the Philippines in 2013. Multiple days of data was gathered and on the day with the highest number of tweets, totaling more than 500,000 regarding Haiyan, roughly 80% of the 500,000 tweets were retweets of messages from media sources, celebrities, and government agencies. While the content of these tweets was not analyzed in depth in this study, the rate and number of retweets shows the importance of the spread of information via retweeted messages.

Grasso and Crisci (2016) studied the use of hashtags on Twitter during weather warnings in Italy and found that not only was the tweet content mostly about regarding specific situational updates but that hashtagged tweets were also very high in geo-location information making it easier to pinpoint specific issues needing attention. Lee, Mahmud, Chen, Zhou, and Nichols (2014) researched various reasons why individuals choose to retweet original posts made by a stranger. Within their results, the issue of location relevance was highlighted. Users chose to redistribute messages because the issue was “happening in my neighborhood” (p. 255) or simply because the individual felt the message contained information that was valuable and helpful to others in their area. This finding brings forward the importance of the geographic proximity of Twitter users in an emergency situation.

Additionally, research into the use of Twitter during two different simultaneous natural hazard events in 2009, Starbird and Palen (2010) showed that tweets with emergency-related information were more likely to be retweeted than other non-topical issues. Moreover, the exploration found that in reference to geographic location, individuals local to the crisis event are more likely to retweet than non-local users and that these local users were more likely to retweet information that was originally posted by local media and traditional service organizations such as fire, police, or emergency rescue departments. Non-local users had a higher percentage of tweets and retweets pertaining to non-informative content which can be classified into an emotional or superficial category (for example, “Amazing Pics of Red River Flood”) (Starbird & Palen, 2010). Further research confirmed the findings that the news media and local authorities are the dominant leaders of retweets in terms of their content (Wang, Ye, & Tsou, 2016).

While research has shown there is a correlation between the tweet and retweet count and a user’s location during a crisis situation, we do not know the degree to which the content of the

tweet and retweet might correlate with the user's location. Overwhelmingly, local users are tweeting and retweeting via Twitter for informational purposes pertaining to their situation and non-local users are sharing via Twitter for social purposes.

Previous research discusses the importance of media outlets, traditional service organizations, celebrities, and government agencies as the information source that are most often retweeted; however, as mentioned in the discussion of the Gatlinburg wildfires, there was little to no content communicated from traditional service organizations or government agencies. Therefore, an analysis of the content using only individual profiles and the removal any of the aforementioned users (media outlets, traditional service organizations, celebrities, government agencies) will aid in this study's theoretical focus on individual uses and gratifications as well as furthering general research in the subject area.

Rationale for Furthering the Uses and Gratification Categories

The conscientious delineation of the many different gratification categories used in the aforementioned studies is emphasized in the proposed gratification definitions for this study. The uses and gratification definitions used to categorize social media use in these studies are decisively parallel; differing only in choice of vocabulary. The Twitter specific studies show that the use of Twitter is not a gratification altering medium. Thus, the gratification measurements used by Lee and Ma (2012), Leung (2009), Lin (2002), and Quinn (2016), Johnson and Yang (2009), Chen (2010), Pentina et al. (2016), and Phua, Jin, & Kim (2017) will be narrowed down to a much smaller, more concise set of categories. A thorough review of the definitions and core needs of a user in reference to social media can be interpreted using only Informational motives and Social motives. Taking guidance from the numerous studies that have already laid the stage

for this repositioning, this paper proposes the excessive list of gratifications previously discussed and reviewed be qualified into three categories.

The basis for this reorganization is to further clarify the gratifications sought by individual who tweet and retweet during a crisis situation. The proposed first gratification category is Informational (or Informative). In this content analysis, this will include any content that refers to news pertaining to the Gatlinburg wildfires. This could include road closings, locations of spot fires, power outages, notifications of individual safety and the like. The sharing of photographs and videos of the fires and the aftermath would also fit into this category. The second gratification category is Social and will include the sharing of heartfelt thoughts or personal statements. Messages in this category might include content such as “Sending love to Gatlinburg”; “Please Stay Safe Tonight”; “My heart is broken”; or similar statements. The third and last gratification category proposed is Distraction (or Distractive). This category will include content that is intended to shift attention from the topic. It can include content such as hate or political speech or something more ‘fun’ such as jokes or humorous memes. This category will also house any content that does not fit within the Informational or Social categories.

The reinterpretation of gratification categories not only aids in the fundamental discovery of gratification sought when using Twitter during a crisis situation but it also reduces the added noise by simplifying the measures.

Given this rationale, the research proposes to explore the following research questions related to the Gatlinburg Fires:

RESEARCH QUESTIONS AND HYPOTHESES

General Tweeting Characteristics

Research by David, Ong, and Legara (2016) and Starbird and Palen (2010), showed that in crisis situations, retweet counts were typically much higher than the original tweet counts therefore the research suggests the following hypothesis:

H1. The retweet count will be exponentially higher than the tweet count.

RQ2a. What is the frequency of Informational, Social, and Distractive content in the tweets?

RQ2b. What is the frequency of Informational, Social, and Distractive content in the retweets?

Questions about Tweeting Gratifications

As Grasso and Crisci (2016) explained, the importance of a user's geographical location in terms of the content of their tweet can impact the type of assistance that is requested or news coverage that is garnered. It can also influence the emotional feelings of individuals outside the crisis area. Research from Currie-Mueller (2014), Johnson and Yang (2009), Starbird and Palen (2010) showed that local users tweet and retweet informational content at a higher rate than social content in an effort to assist and advise others in the crisis affected area and so this research begins with an assumption that local users will tweet and retweet informational content at a higher rate than social content. However, no prior research has examined locational differences by including all three gratifications of information, socialization and distraction. Further, this current research differs somewhat from Starbird and Palen in that it uses specific geolocation data from each tweet and retweet to assign a geographical location rather than using an increased frequency of keywords to designate a user as local. Additionally, research from Spence et al, 2015 and Lachlan et al, 2014 suggest that distractive content is high in times of

crisis as a tool for emotional coping therefore an additional assumption is that the frequency of distractive content in tweets and retweets will be on par with the frequency of social and informational content of tweets and retweets. Both Spence et al, 2015 and Lachlan et al, 2014 looked at data from an extended period during a crisis event which potentially may have had a significant impact on the frequency of distractive content Because of the importance of the geographical location of the user, the research proposes to explore the following research questions:

RQ3a. Did individuals who were geographically located within the local, regional, and non-local groups differ in terms of their **Informational tweets**?

RQ3b. Did individuals who were geographically located within the local, regional, and non-local groups differ in terms of their **Social tweets**?

RQ3c. Did individuals who were geographically located within the local, regional, and non-local groups differ in terms of their **Distractive tweets**?

Questions about Retweeting Gratifications

As stated as above, a user's geographical location is important and so that information is carried forward and built upon. Retweeting of information has been found to provide a great deal of information regarding the gratifications sought by users, especially within specific geographical locations (David, Ong, and Legara, 2016; Lee et al, 2014). To that end, the research proposes to explore the following research questions:

RQ4a. Did individuals who were geographically located within the local, regional, and non-local groups differ in terms of their **Informational retweets**?

RQ4b. Did individuals who were geographically located within the local, regional, and non-local groups differ in terms of their **Social retweets**?

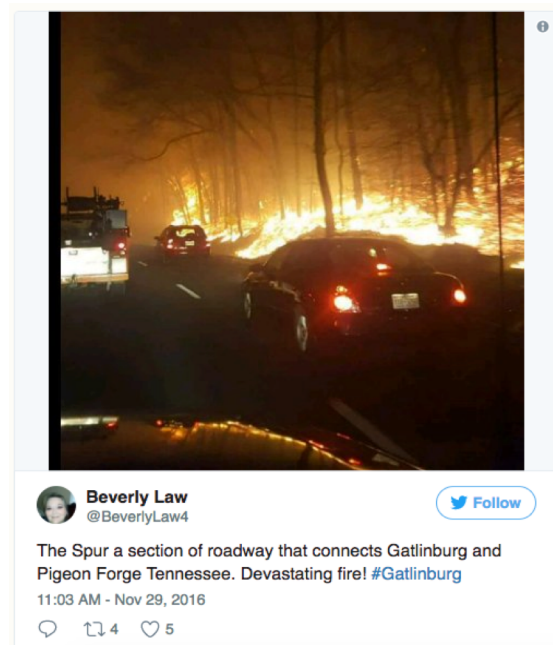
RQ4c. Did individuals who were geographically located within the local, regional, and non-local groups differ in terms of their **Distractive retweets**?

RESEARCH METHODOLOGY

In order to answer the research questions, this study uses content analytic approach to analyze the tweets and retweets that took place during the Gatlinburg fires. Tweets were accessed using the web-based, application programming interface (API)-enabled social media collection tool *Sifter* and the *Gnip PowerTrack* software which can access every non-deleted tweet in Twitter's archive ("Texifter" 2017). The application *DiscoverText* was then used to code and analyze the tweets. This program was chosen because it presents individual tweets in the native Twitter display. This means when looking at a tweet in DiscoverText, the coder sees any images, media link previews, and a live display of the accumulated re-tweet and favorite counts as seen in Figure 2.

The researcher chose to search and collect tweets using hashtags to gather topical information using the following hashtags: #gatlinburg, #gatlinburgwildfire, #gatlinburgwildfires, #GSMNP,

Figure 2. Example of tweet display from DiscoverText



#smokeymountains, #prayforgatlinburg. The specific hashtags were chosen after reviewing the list of trending hashtags that was provided on a sidebar of the Twitter interface. The six hashtags were searched using a Boolean OR function, rather than an AND function so that any combination of one or more hashtags could appear within the tweet. Subtle additions were made to enhance the results such as making the word ‘wildfire’ plural. The timeframe for this study initially spanned from Wednesday, November 23, 2016, when the Chimney Tops 2 Trail fire was discovered through the end of the day on Tuesday, November 29, 2016, which was 24 hours after the sudden spread of the fires into the city limits of Gatlinburg, TN. The search returned a total of 241,408 tweets with at least one of the aforementioned hashtags within the body of the tweet.

Table 2. Breakdown of tweets per day

Date	Nov 23	Nov 24	Nov 25	Nov 26	Nov 27	Nov 28	Nov 29
# of tweets	123	129	152	110	68	614	240,212

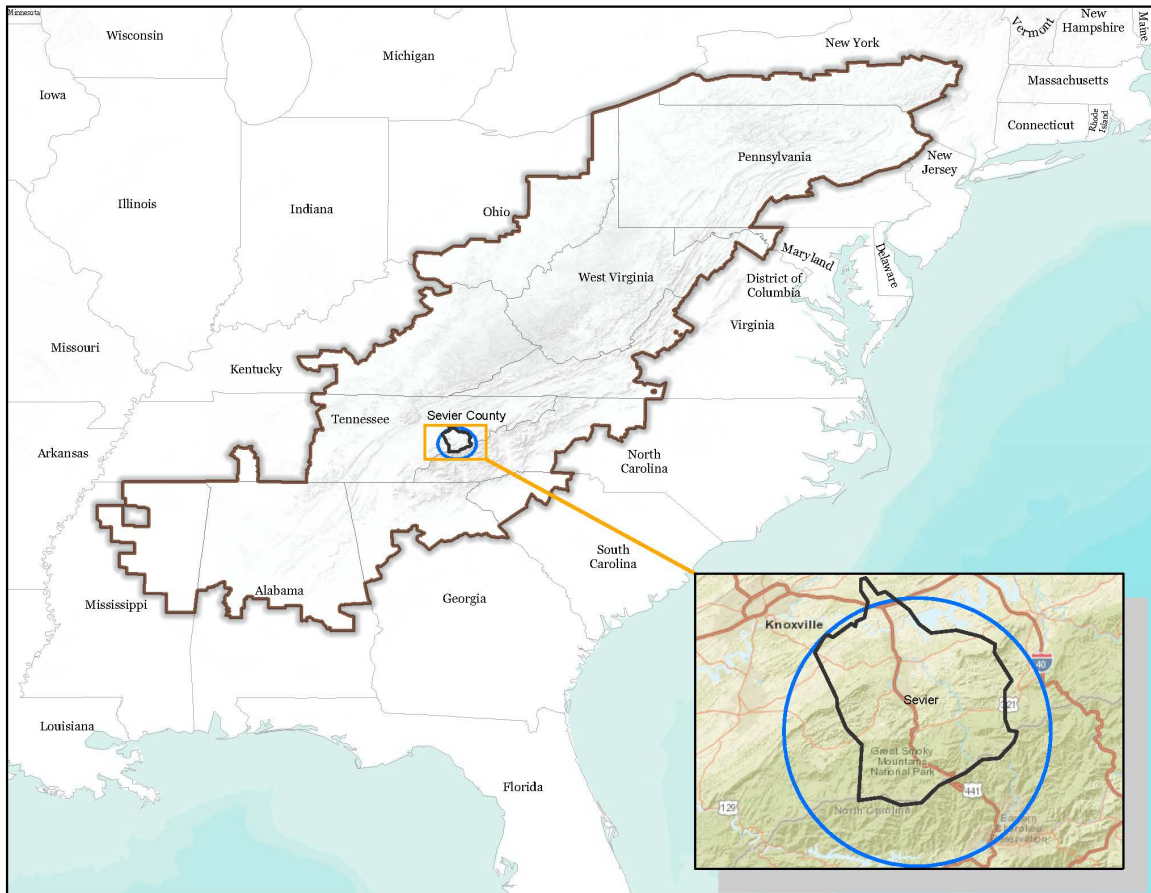
As mentioned previously, the fire spread from the mountain trail to the city limits on November 28. The comparatively low number of tweets on early days alludes to the lack of knowledge of the emergent situation in the early days of the fire. Due to the minimal number of tweets on November 23 through November 27, the researcher decided to eliminate that data from the selected sample. This brought the potential population to 240,826 tweets that were posted within the 48 hours of Monday, November 28 and Tuesday, November 29.

In order to accurately code for local, regional, or non-local user, a specific geolocation of the tweet was needed. The visibility of user geolocation is a controllable feature within a Twitter profile. The location feature is turned off by default and users must opt-in in order to geotag their

tweets with their exact location in the form of latitude and longitude. Previous studies have shown that approximately 0.85% of tweets are geotagged, meaning that the exact position of where the tweeter was when the tweet was posted is recorded using longitude and latitude measurements (Sloan and Morgan, 2015). As a result, further culling of the data was required to remove tweets that did not list a geolocation of the user, which brought the final number of usable tweets to 4,415. Using the *Esri ArcGIS* program with the latitude and longitude of Gatlinburg, TN, (35.714321°, -83.510391°), the tweets were separated into three groups: local, regional, and non-local. A 20-mile radius for the local group was chosen as the county of Sevier is a closely matches that of the 20-mile radius of Gatlinburg. Rather than using a radius of Gatlinburg for the regional area, the researcher chose to include the entire Appalachian Region as defined by the Appalachian Regional Commission legislation, which includes a 205,000 square-mile region that followed the Appalachian Mountains from southern New York to northern Mississippi (The Appalachian Region, n.d.). The Appalachian Regional Commission lists the counties within each state that are considered part of the Appalachian Region. Those counties were selected in a query within *ArcGIS* to produce a full map which sorted the geographically referenced tweets. A map of the local and regional areas sampled for this research can be seen in figure 3.

The Appalachian area was chosen due to the cultural identification and connection of the Gatlinburg area. As a Gatlinburg tourist websites state, “There’s no better place to experience Appalachian culture and history than Gatlinburg and the Great Smoky Mountains.” (Martha My

Figure 3. Map of local and regional areas used for tweet categories

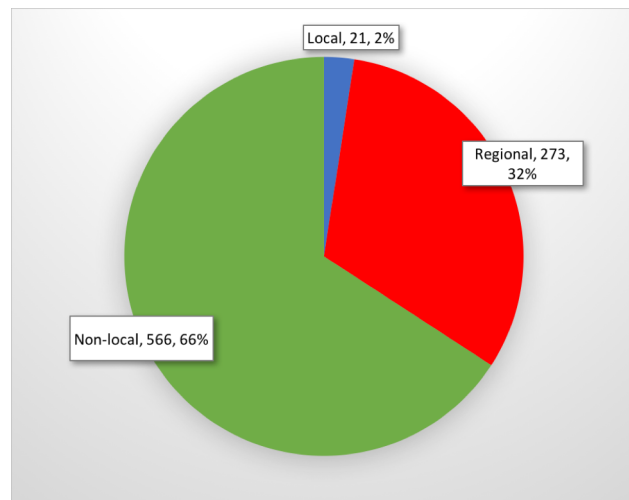


Dear, n.d.). Any tweets that were labeled outside the local or regional areas were listed in the non-local group. This separation resulted in a breakdown of the 4,415 tweets to 105 local, 1,403 regional, and 2,907 non-local.

To create a subsample of the population from the 4,415 tweets, a random, stratified sample was used for analysis. A total of 860 tweets was selected from the final dataset for further coding. The sample number of 860 tweets was selected achieve a 95% level of confidence in the sample and a +/- 3% sampling error (Neuendorf, 2002). A stratified sampling technique was

chosen to be sure the proportions of the three geographic regions were adequately represented in the final sample. In order to ensure random tweets from each group, numbers were generated using Randomizer.org and matched to a unique tweet ID#. The final sample of 860 tweets was broken into 21 local, 273 regional, and 566 non-local and can be seen graphically in Figure 4. The unit of analysis for this study was the 140-character tweet or retweet plus any accompanying content within the tweet such as images and videos. Accompanying content may be hyperlinked within the text of the tweet or embedded as an automatic visual within the tweet. Any hyperlinks within the tweet that took the coder to another site were followed to the extent of one click to adequately determine the content of the tweet.

Figure 4. Tweets by location



Operationalization of Measures

In order to analyze the content of the tweets a codebook was first created to provide definitions of each variable. The following items were included in the analysis:

Appropriateness of tweet content. In order for a tweet to be an appropriate unit of analysis there must be actual content that can be examined. Furthermore, content must be related to Gatlinburg, TN in some way, shape, or form. As events or topics become more popular or viral on the internet and related hashtags begin to trend, users or bots post spam or hijacking content in an effort to gain attention and views. Any tweet that was in a foreign language was labeled as

an inappropriate tweet. A tweet with a hyperlink that was not active was coded as not inappropriate as it does not have the full information to code accurately. Additionally, any tweet that did not show in the DiscoverText tweet display, as described in Figure 2, was an indication that it was deleted by the user, therefore did not include all of the necessary content to code in full, so it was counted as not an appropriate item. A tweet that was an appropriate item in that it was not spam and/or did not include deleted information but did not make a reference to the Gatlinburg fires in any way was coded as not an appropriate item. Questions 2 and 3 on the codesheet address the appropriateness of the tweet.

Who is the user? The owner of the Twitter handle or profile was defined as the user. For the purposes of this study, only tweets by individuals were used in the analysis; however, the other categories of user were coded for potential use in further research and to be able to separate individuals from other types of twitter content (e.g. news organizations, non-profits, etc.). This category was quantified using Question 6 on the codesheet which classified and defined the following users:

- *Individual* users were categorized as a single person. Individuals in this category were ‘everyday’ people – citizens, neighbors, etc. Individual users were those who were not categorized by any other category.
- *Celebrity* users were categorized as actors, musicians, or other individuals with an extremely large following and a verified Twitter account. This also included celebrity groups such as bands or a cast of actors.
- *News/Media Outlet* users were categorized as any news/media outlet or reporter whether it was broadcasted via internet, television, radio, or in print.

- *Traditional Service Organization* users or individuals identified as members of fire, police, emergency rescue, park ranger, or similar departments.
- *Government Agency* users or individuals identified as public officials such as a town or municipality’s official Twitter platform. This also included users such as the National Weather Service or Department of Transportation.
- *Business* users or individuals classified as any for-profit business such as a restaurant, dentist office, or car dealership, for example.
- *Non-Profit/Aid-related Business* these users were such entities as the Red Cross or a local humanitarian center.
- *Not Sure*. Any other user that does not fit into any of the listed categories is housed in the ‘not sure’ category.

Content of the Tweet. The crux of this study is to learn the type of content of the Gatlinburg wildfire related tweets. All tweets were coded for one or more of the following gratifications in Question 7, 8, and 9 on the codesheet.

- *Informative/Informational* content was any content that referred to news pertaining to the Gatlinburg wildfires. This included but was not limited to road closings, locations of fires, power outages, notifications of individual safety and the like. The sharing of photographs and videos of the fires and the aftermath fit into this category.
- *Social content* included the sharing of heartfelt thoughts or personal statements. Messages in this category might include but is not limited to content such as “Sending love to Gatlinburg”; “Please Stay Safe Tonight”; “My heart is broken”; or similar statement.

- *Distractive/Distraction* content included content, text, images, or videos, that were intended to shift attention from the topic. It included content such as hate or political speech or something more ‘fun’ such as jokes or humorous memes. It also includes content that does not fall into one of the first two categories. This category also housed any content that does not fit within the Informational or Social categories.

Geolocation. The location of the user was also one of the more important aspects of this study. The tweets were separated into three groups: local, regional, and non-local. A 20-mile radius for the local group was chosen as the county of Sevier is a close match to that of the 20-mile radius of Gatlinburg. Tweets gathered in this area were labeled as local. The entire Appalachian Region, which includes a 205,000 square-mile region that follows the Appalachian Mountains from southern New York to northern Mississippi is qualified as regional. Any tweets gathered from this area were labeled as regional. Any tweets that were not labeled local or regional were listed in the non-local group. This information was aggregated separately and was coded automatically using Question 10 from the codesheet.

Type of Tweet. An *original or native tweet* consisted of content that was original content by the user. A *Retweet* consists of content that has previously been posted and was simply being reposted by a new user. This could be somewhat tricky to navigate as in some cases; a user may remove the @RT text that signifies the content is being forwarded from an already published message. The new poster may or may not add original content. Coders addressed this as during the reliability/practice sessions and made a decision on how to code for obviously retweeted content. Any hyperlink that included “twitter.com” as part of the URL was considered a retweet. If the hyperlink was from a source other than Twitter, it was considered an original tweet. This was coded using Question 11 from the codesheet.

Additional content. *Images* are photos or pictures that were hyperlinked or embedded within the tweet visual. *Videos* were videos (auto play or not) that are hyperlinked or embedded within the tweet visual. *Hyperlinks/Links* are URLs that were clickable within the tweet visual and take the reader to a new window. This could be but was not limited to a news article, an Instagram post, or a website. *Other Hashtags* are any other #hashtags that are listed within the tweet or retweet, not including the six originally searched hashtags. This was coded using Question 12 on the codesheet.

After coding the original 860 tweets, 176 entries were removed because they were deemed to not be appropriate items of analysis as explained in the codebook. Additional tweets were coded to bring the sample size back to 860 tweets. Counts for the geographic locations for local, regional, and non-local were maintained at 21, 273, and 566, respectively.

Analysis of Results

In order to answer research questions 2 a and b, information was gathered using a codesheet (See appendix A). Question 11 was used to identify whether the item was a tweet or a retweet, in order to capture frequency of tweets and retweets in the study. The frequency of Informational, Social, and Distractive content within native tweets and retweets as asked in research questions 2 and 2a was gathered using codesheet questions 7, 8, and 9. Research questions 3 a, b, & c, regarding tweeting gratifications and geographic locations was answered using codesheet questions 7, 8, and 9. Likewise, research questions 4 a, b, & c, regarding retweeting gratifications and geographic locations was also answered using codesheet questions 7, 8, and 9 to identify the type of gratification. Question 10 identified whether the tweet or retweet was local, regional, or non-local. Question 11 identified whether the tweet was a

native/original tweet or a retweet. Codesheet questions 1, 2, 3, 4, 5, 6, and 12 aided in the sorting and delineation of the tweets to verify they were suitable to be included in the final analysis.

Reliability Assessment

Prior to beginning the formal content analysis of the selected tweets, the researcher enlisted a fellow graduate student to participate in a preliminary analysis that contributed to the final list of coded variables investigated as well as the increased reliability of the results. In order to code for the content of the 860 tweets, a codebook was developed using the operationalized terms to provide guidance for the coding session. A copy of the final codesheet can be found in Appendix A. A copy of the final codebook can be found in Appendix B. An initial coding session was scheduled to explain the codebook and to train the graduate student on the method of coding using DiscoverText and Qualtrics. The researchers coded the 20 tweets together to begin in the initial analysis to refine the codebook for increased reliability. The codebook was revised to establish clearer standards for analysis in cases where confusion arose. Once the researchers had clear understanding of the coding criteria, they each received the same set of 86 tweets to code, which was 10% of the full sample. This reliability subsample was chosen based on guidance from Neuendorf (2002) who recommended 10-20% of the total sample. Once the coding for reliability was complete, the results were reviewed using ReCal, a reliability calculator found online at <http://dfreelon.org/utis/recalfront/>. Upon receiving an unsatisfactory reliability using Scott's Pi and Cohen's Kappa standards, the researchers discussed and revised the codebook again. The researchers coded an additional 40 tweets (5% of the full sample) which resulted in reliabilities of .70 or higher (Neuendorf, 2002). Table 3 contains the specific results of the reliability analysis.

Table 3. Intercoder Reliability Scores

	% Agreement	Scott's Pi	Cohen's Kappa
User Type	97.5%	.739	.74
Content Type			
Informational	95%	.881	.881
Social	97.5%	.946	.946
Distraction	97.5%	.945	.945
Tweet Type	100%	1	1

Following the reliability analysis, the primary researcher continued coding the remaining 734 tweets using the revised codebook. The full data set was analyzed using the statistical program *SPSS* using the Pearson Chi-Square analytical test.

RESULTS

The research questions 2 a and b were designed describe the population sample. The first research question examined the frequency of tweets vs retweets within the total 860 sample. Original tweets accounted for 50.6% ($N=435$) and Retweets accounted for 49.9% ($N=425$). Research question 2a and 2b was designed to describe the frequency of the tweets and retweets as broken down by content; Information, Social, and Distraction. Of the original tweets, there was a significant majority of Social content present ($N=384$) versus Information and Distraction ($N=96$ and $N= 26$, respectively). For the retweets, the Social content ($N=379$) was still higher than the Informational content ($N=281$) however the difference the two was not as large as it was for original tweets. As shown for the original tweets, the Distractive content ($N=80$) in retweets was also lower than the Social and Informational content for retweets. The results show that

there was significantly more Social content tweeted and retweeted ($N=763$) than Informational ($N=377$) and even less Distraction content ($N=106$). The findings are detailed in Table 4.

Table 4. Count and percentage frequency of content by tweet and retweet

	Informational		Social		Distraction	
	count	%	count	%	count	%
Tweets	96	22.1	384	88.3	26	6.0
Retweets	281	66.1	379	89.2	80	18.8
Total sample	377	43.8	763	88.7	106	12.3

Note: The three content categories are not mutually exclusive therefore do not equal $n=860$ (100%).

Research questions 3 a, b, & c began the inquiry of geographic location and how it affected the content of the tweets. (See Table 5 for the results of RQ 3a, b, c.) Research question 3a asked if individuals who were geographically located within the local, regional, and non-local groups differ in terms of their **Informational tweets**. The results showed significant differences, $\chi^2(2, N=435)=12.684, p=.002$. Specifically, there were no differences in the proportion of local versus regional tweets with a 99% confidence using the Pearson Chi-Square statistical test. However, there were significantly more local ($N=7$) and regional ($N=42$) than were expected, while the non-regional tweets were somewhat lower than expected ($N=47$) in the informational category. In other words, people in the local and regional areas tweeted more informational content than was expected.

Table 5. Percentage of Tweets by geographic location.

Tweets	Local	Regional	Non-Local	Total
Information	41.2 _a %	29.8 _a %	17.0 _b %	22.1%
Social	88.2 _a %	90.1 _a %	87.4 _a %	88.3%
Distraction	0.0 _{a,b} %	2.1 _b %	8.3 _a %	6.0%

Each subscript letter denotes a subset of Location categories whose column proportions do not differ significantly from each other at the .05 level.

Research question 3b asked if individuals who were geographically located within the local, regional, and non-local groups differ in terms of their **Social tweets**? The results did not show significant differences in the proportion of tweets, $\chi^2(2, N=435)=.661, p=.72$. That is to say, the actual count and the expected counts were extremely similar, hence the high p-value.

Research question 3c asked if individuals who were geographically located within the local, regional, and non-local groups differ in terms of their **Distractive tweets**? The results showed significant differences, $\chi^2(2, N=435)=7.466, p=.024$. Specifically, while there were no significant differences between the local and the regional or the local and the non-local, there were, however significant differences between the regional and non-local areas.

The significant differences show the regional area where the actual count versus the expected count was 3 and 8.4, respectively; the non-local where actual count versus the expected count was 23 and 16.6, respectively. The results here showed that while overall the majority of tweets came from non-local individuals and that rate was higher than expected. Additionally, there were fewer distractive regional tweets than were expected.

Research questions 4 a, b, & c began the inquiry of geographic location and how it affected the content of the tweets. (See Table 6 for the results of RQ 4a, b, c.) Research question 4a asked if individuals who were geographically located within the local, regional, and non-local

groups differed in terms of their **Informational Retweets**? The results showed no significant difference in the proportion of tweets $\chi^2(2, N=425)=4.908, p<.086$. The actual count and the expected counts of information retweets are statistically similar for all three geographical areas.

Table 6. Percentage of Retweets by geographic location

Retweets	Local	Regional	Non-Local	Total
Information	75.0 _a %	73.5 _a %	62.6 _a %	66.1%
Social	50.0 _a %	90.9 _b %	88.9 _b %	89.2%
Distraction	0.0 _a %	15.9 _a %	20.4 _a %	18.8%

Each subscript letter denotes a subset of Location categories whose column proportions do not differ significantly from each other at the .05 level.

Research question 4b asked if individuals who were geographically located within the local, regional, and non-local groups differ in terms of their **Social Retweets**? The results showed a significant difference between the local and regional as well as local and non-local but no significant differences between regional and non-local with a 95% confidence using a Pearson Chi-Square test, $\chi^2(2, N=425)=6.790, p=.034$. Specifically, there were a similar number of retweets from what was expected in the regional (117.7 expected, 120 actual) and non-local categories (257.7 expected and 257 actual). However, the local category had far fewer retweets overall (.5%) and fewer (3.6 expected and 2 actual) than what was expected for that category.

Research question 4c asked if individuals who were geographically located within the local, regional, and non-local groups differ in terms of their **Distraction Retweets**? The results showed no statistically significant differences between the three locations, $\chi^2(2, N=425)=2.140, p=0.343$. For local and regional, the expected count was higher than actual count and in contrast,

the non-local expected count was lower than actual count however the difference was not enough to be statistically different (See Table 7.)

Table 7. Results of expected versus actual count of each geographic region

	p-Value	Local		Regional		Non-Local	
		Actual	Expected	Actual	Expected	Actual	Expected
Tweets							
Information	0.002**	7 _a	3.8	42 _a	31.1	47 _b	61.1
Social	0.718	15 _a	15	127 _a	124.5	242 _a	244.5
Distraction	0.024*	0 _{a,b}	1	3 _b	8.4	23 _a	16.6
Retweets							
Information	0.086	3 _a	2.6	97 _a	87.3	181 _a	191.1
Social	0.034*	2 _a	3.6	120 _b	117.7	257 _b	257.7
Distraction	0.343	0 _a	8	21 _a	24.8	59 _a	54.4

Note: Each subscript letter denotes a subset of Location categories whose column proportions do not differ significantly from each other at the .05 level.

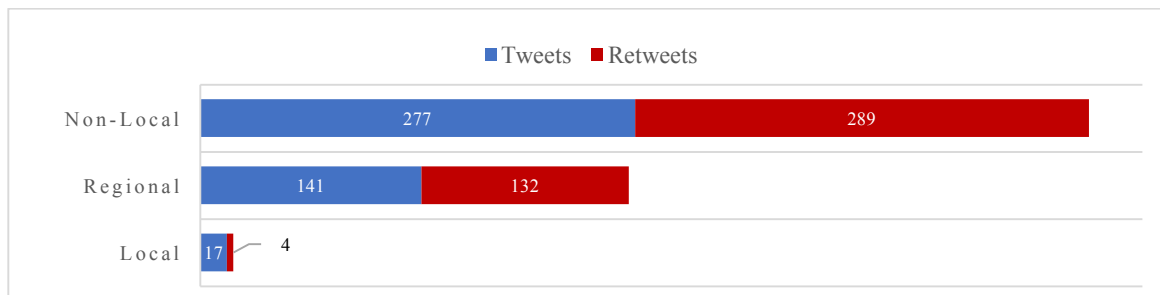
Note: The following * were used to denote p-values: * p<.05, **p<.01, ***p>.001

DISCUSSION

This research set out to explore how individuals used Twitter during the Gatlinburg, Tennessee wildfire event of November 2016. More specifically, how and what did people from different geolocations share via Twitter during the crisis event and what gratifications were sought by their use of Twitter. The research first began looking at the frequency of tweets and retweets as well as the overall content of the tweets and retweets. As explained in H1, the expectation was that the retweet count would be exponentially higher than the original tweet count (David, Ong, and Legara, 2016; Starbird and Palen, 2010). However, the analysis of the coded sample data set did not support this assumption, in fact, a ratio of almost 50:50 tweets to retweets in the full sample was unanticipated.

Additionally, in looking more closely at the data, the proportion of tweets versus retweets stayed remarkably close for both the regional and non-local individuals; however, the results showed a noteworthy difference for local users which can be seen in Figure 5. So why did the local individuals not retweet or tweet very much, at all for that matter? These findings might suggest a different set of motivations for the local individuals given their proximity to the wildfire event. Conceivably their main focus may have been personal safety rather than using

Figure 5. Tweets and retweets by geographical area



Twitter. In fact, the overall low percentage of local individuals using Twitter might suggest that they were far too busy evacuating the Gatlinburg area to concern themselves with the talk on social media. Furthermore, given the news reports that the wind storm and spot fires had caused power lines and cellular towers to fall down (WATE6 News, 2016), there is a possibility that the individuals in the local area did not have cellular service during all or part of the 48 hours analyzed.

Analysis of the content of the tweets and retweets as asked in Research questions 2a and 2b shows that overall, the majority of tweets and retweets contained social content. The abundance of social content (88.3%) versus informational (22.1%) and distractive (6.0%) content in native (RQ2a) tweets might suggest that in this time of crisis, individual users turned to

Twitter to connect with others and share their thoughts and feelings about the situation that was unfolding. Perhaps the low number of informational content is telling of the lack of news coverage and or valid reports on what was actually happening in the area. In terms of the retweets (RQ2b), the numbers shift slightly. Social content (89.2%) was still retweeted at the highest rate but informational content (66.1%) was shown to be very important in retweets. Additionally, although the number is still comparatively small, distractive content (18.8%) in retweets increased as well. A logical assumption for the increase of informational retweets might be that a small amount of valid news was initially tweeted and users retweeted and retweeted and a high rate. This can be explained by the premise by Boyd, Golder, & Lotan, (2010) which analogizes retweets to the forwarding of emails. The frequency of tweets and retweets in terms of distractive content (26 tweets, 80 retweets) can be explained by the same logic as the informational retweets.

Research questions 3a and 4a looked at informational content within tweets and retweets and asked if there were differences based on geographic location. In terms of the original tweets (RQ3a), analysis showed that people in both local and regional areas tweeted more informational content than was expected. A basic assumption is that users in the local and regional areas had more informational content available to share than users in the non-local area simply based on their proximity or emotional ties to the Gatlinburg area. While there were significant differences in the informational category in terms of tweets, there were not regional differences in the retweets (RQ4a) in this category. One reason for this may be because once the information about the fires was tweeted, it was available for any user to retweet despite geographical location.

The presumption that local users would tweet and retweet informational content at a higher rate than social content in an effort to assist and advise others in the crisis effected area as

discussed previously (Currie-Mueller, 2014; Johnson and Yang, 2009; Starbird and Palen, 2010) was shown to only be somewhat accurate. The shift in content could infer that local users did not have very much information about exactly what was happening regarding the specifics of the fires, potentially due to the reported lack of communication by public officials; therefore, their social content outweighed the informational content. It is also a possibility that informational tweets that did come from local individuals were in specific areas of Gatlinburg that were not affected by the fires, and therefore, those individuals who were not in danger were tweeting social messages in an effort to stay connected to their neighbors.

Table 8. Counts of Social Content

		Tweets	Retweets
Local	Actual	15	2
	Expected	15	3.6
Regional	Actual	127	120
	Expected	124.5	117.7
Non-Local	Actual	242	257
	Expected	257	257.7

Research questions 3b and 4b

looked at the social content within tweets and retweets and asked if there were differences based on geographic location. In the comparison of actual versus expected count of social content across all geographical locations, an interesting

finding was noted. Despite one notable exception which will be discussed below, there were no differences in the rate of actual versus expected tweets and retweets across geographic locations. The two counts were not only statistically similar; in all but one case the numbers were nearly identical (see Table 8). The fact that individuals were tweeting and retweeting social content at, not only a very high rate, but also at an expected rate, supports uses and gratifications research which says individuals use different forms of media for social connection purposes (Lee and Ma, 2012; Leung, 2009; Lin, 2002; Quinn, 2016; Pentina et al, 2016; Phua, Jin, and Yang, 2017; and Chen, 2010). Perhaps even more importantly, communication and sharing of social content may

be an important factor in helping individuals cope with personally troubling and/or crisis situations.

In reference to the one exception noted above, for users in the local area, the actual number of retweets with social content was significantly lower than the expected. This could be explained by the fact that as the individuals were local to the wildfire event and had already shared their social content, they felt no need to retweet the same sentiments or other's social commentary. Perhaps this is where the rate of local retweets containing informational content increases. It is possible that local users were more interested in sharing social, personal content but resharing and spreading informational content. Analysis of the content of the tweets and retweets show that the content of local users' original tweets were predominately more social (88.2%) than informational (41.2%); however, the content reversed for retweets with local users sharing more informational (75.0%) than social (50.0%) content.

The amount of social content was more than double that of informational content as shown in Table 4. This is a noteworthy observation as previous research into the use of Twitter during crisis situations have primarily focused on fulfilling informational needs and gratifications (Currie-Mueller, 2014; Lachlan, Spence, Lin, and Del Greco, 2014; Spence et al, 2015; Mazer et al, 2015; Shaw, Burgess, Crawford, and Bruns, 2013). This research shows that individuals are sharing and resharing social content rather than informational content at a much higher rate regardless of their geographical location.

Research questions 3c and 4c looked at the distractive content of tweets and retweets and asked if there were differences based on the geographic location of the user. Local and regional users tweeted and retweeted distractive content less than expected while non-local users tweeted and retweeted distractive content more than expected. An easy explanation for this is simply the

lack of personal connection that non-local users might have had to the Gatlinburg area and therefore it was easier for them to share the distractive, focus-shifting content. Given the popularity of memes and the speed at which news gets hijacked, the researcher assumed that the amount of Distractive content would be significantly higher than it proved to be. Of the 860 tweets, 12.3% (N=106) were coded as having some Distractive content. Of those 26 tweets and 80 retweets, approximately two-thirds of them were a feel-good video of a rescued baby bear that would not let go of the leg of the man who saved it. The video was retweeted with heart emojis and heartfelt statements about the Gatlinburg area and there were also comments noting that the video was a fraud and not from Gatlinburg at all. The fact that the video was not accurate did not seem to matter to users as the content succeeded in distracting individuals from the tragedy of the fires.

The other one-third of the tweets with Distractive content were politically fueled and all stemmed from one single tweet by @1_Prag (aka Tobias Beecher) and can be seen in Figure 6. Throughout the coding process, this tweet was the only negative content that was found. This single negative tweet accounts for one-third of all Distractive content coded (N=~35). Every single retweet of this post was either chastising the user for his awful comments or calling for the termination of his account due to hate speech. Notably, the original tweet had been deleted by the user; however, the retweets were screenshots of the original tweet.

Figure 6. Screenshot of Distractive tweet as seen in coding process



Perhaps the humor and otherwise hijacking content is something that occurs after the crisis is over or at least does not have so many unknown details surrounding the event. Looking at the same type of data days or weeks after this study's data might produce very different results.

As seen in Tables 5 and 6, the rate of distractive content increases at a rather steady rate as the user is farther removed from the location of the wildfires. This observation could infer that those individuals who did not have a social or emotional connection to the Gatlinburg area did not have an objection to sending more distractive content. There may be a connection between the user distance from the crisis and rate of distractive content that could be analyzed to a greater extent with additional data.

Other Relevant Findings

The complete lack of humorous memes appearing within the sample set for this study was quite surprising especially considering similar analysis for another crisis event. The 2014 research of Twitter content from Hurricane Sandy found that over 15% of the tweets contained jokes or humorous messages (Lachlan et al, 2014). Even the meme used as an example in Figure 1 was found in an internet search rather than in one of the sample tweets. Perhaps the creation of such memes and the manufacturing of humor in a crisis situation needs time to develop. A look at the same population at a later date might produce far more distractive content of the humorous vein.

Another interesting find in the data analysis was the high level of political commentary among users that was not noted to be within any specific geographical location over another. While the political content was not coded for, it is worth mentioning as some users felt the

Gatlinburg wildfires were not covered in a timely manner or with enough substance by the news media due to the abundance of political coverage. To put this event into context with the political landscape at the time, Donald J. Trump had been elected as the 45th President of the United States just three weeks prior.

From the total sample of 860 tweets, 377 (43.8%) of the tweets and retweets were coded as having informational content and 763 (88.7%) were coded as having social content (Refer to Table 4.) The obvious trend observed was that most of the informational tweets and retweets also contained a social component. In fact, only 62 (7%) tweets of the entire 860 sample were coded as having only informational content while 367 (42%) tweets from the entire 860 sample were coded as having only social content. Further breakdown shows that of the 62 information only tweets, 33 were original tweets and 29 were retweets. Of the 367 social only tweets, 304 were original tweets and 63 were retweets. These results suggest that while the sharing of information was important during this crisis, the primary motivation for individuals to use Twitter during the wildfires was to share and seek social content. Making a social connection has proven to be a very important feature to uses and gratifications research and it plays a strong role in the development and extension of other gratifications.

LIMITATIONS

One of the biggest limitations in this research was the lack of geographical information available on the tweets. The initial population of tweets with the corresponding hashtags was over 240,000. Dropping to only 4,415 usable tweets, while still a good sample size was disappointing. Even more disappointing was finding that only 105 of those were from local users, especially when the equations for the stratified sample brought the local set to only 21 tweets.

Research into what factors prompt users to enable location tagging shows not a great deal of difference between men and women or between specific ages, however, individuals under age 25 did enable geotagging at a slightly higher rate (Sloan and Morgan, 2015). As reported in 2014, researchers at IBM have developed an algorithm that can predict a Twitter user's location without the use of geolocation information with a 58% accuracy (Johnston, 2014).

Additional limitations stem from the coding itself. If the process were to be completed over again, suggestions would be made to code for more specific content or the option to drill down within the three content categories. During the coding process, the researcher noticed a great deal of repetition. Not only were there notable similar sentiments or content tweeted or retweeted but the exact same blocks of content were found to be retweeted over and over. Developing a method for tracking this repetition might offer insight on how and why tweets become viral across the Twitter platform.

IMPLICATIONS AND FUTURE RESEARCH

This research could potentially imply that a social media platform such as Twitter is not helpful to users in a crisis situation. According to Pew Research Center, the use of Twitter is still at the lowest of all measured social media platforms (Facebook, Instagram, Pinterest, LinkedIn, Twitter) across gender, age, education, income, and location (Pew Research Center, 2017), which may explain why there was not as much Twitter activity, especially within the local area as expected. It might also suggest that Twitter may not be the best forum for the sharing of accurate information. However, that is not to say it is not helpful to users. Additional research into geographical tagging of users during crisis events, for instance, could have beneficial results both for social connectivity of users as well as for emergency response purposes. As the use of social media continues to grow, so do the possibilities and opportunities.

CONCLUSION

This study examined the frequency and content of tweets across geographical locations during the Gatlinburg wildfire event of November 2016. The initial assumption was that local users would tweet significantly more informational content than regional or non-local users. Also, it was presumed that regional and non-local users would social content at a higher rate than informational content. Additionally, it was expected that the rate of retweets would be exponentially higher across all three geographical areas, local, regional, and non-local, predominately. The findings showed none of these hypotheses to be true. In terms of the theory of uses and gratifications and how it relates to the reasons individuals use social media during crisis situations and events, this study shows that despite location, all users tweeted and retweeted equally and the primary gratification that was sought was social connectivity. The amount of social content to informational content; a ratio of almost 4:1 suggests that individuals are using Twitter much more as a means of social connection rather than for informational purposes. The addition of distractive content observation in this study potentially extends the uses and gratifications theory to explain the need to escape or shift focus, at least temporarily, during times of crisis. Concerning the Gatlinburg wildfires crisis event, Twitter did not prove to be a useful tool in disseminating information throughout the three sets geographical located individuals, nor did it clearly show that the local users were using Twitter as initially assumed they would in this crisis event.

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APPENDIX A: CODESHEET

Gatlinburg Tweets

Start of Block: Default Question Block

Q1 Tweet ID#

Q2 Coder Name

- Colleen (1)
- Laura (2)
-

Q3 Date of Tweet

- Monday, Nov 28 (1)
- Tuesday, Nov 29 (2)
-

Q4 Is the tweet an appropriate unit of analysis? (No, if this is spam or a hijacked tweet)

- Yes (1)
- No (2) _____

Skip To: End of Survey If Is the tweet an appropriate unit of analysis? (No, if this is spam or a hijacked tweet) = No

Q5 Does the tweet make any reference to the Gatlinburg Wildfires of November 2016?

- Yes (1)
- No (2)
-

Q6 Who is the user? If not easily decipherable, see metadata tab for more info.

- Individual (1)
 - Celebrity (2)
 - News/Media outlet (3)
 - Traditional Service Organization (fire, police, emergency rescue, park ranger, etc.) (4)
 - Government Official/Agency (local/national official Twitter platform) (5)
 - Business (for profit business) (6)
 - Non-Profit/Aid-related Business (ex. Red Cross, Goodwill) (7)
 - Not Sure/Other (8)
-

Q7 Does this tweet have Informative/Informational content?

- Yes (1)
 - No (2)
-

Q8 Does this tweet have Social content?

- Yes (1)
 - No (2)
-

Q9 Does this tweet have Distractive/Distracton content?

- Yes (1)
 - No (2)
-

Q10 Is the user local, regional, or non-local?

- local (1)
 - regional (2)
 - non-local (3)
-

Q11 Is the tweet content original or a retweet?

- Original content (1)
 - Retweeted content (2)
-

Q12 Is there additional content within the tweet?

- Images (embedded or hyperlinked) (1)
- Videos (embedded or hyperlinked) (2)
- Hyperlinks (3)
- Other hashtags (4)
- No additional content (5)

End of Block: Default Question Block

APPENDIX B: CODEBOOK

Variable	Description
Appropriateness of tweet content	<ul style="list-style-type: none"> – In order for a tweet to be an appropriate unit of analysis there must be actual content that can be examined. – Content must be related to Gatlinburg, TN in some way, shape, or form. – As events or topics become more popular or viral on the internet and related hashtags begin to trend, users or bots post spam or hijacking content in an effort to gain attention and views. – Any tweet that is in a foreign language will be labeled as not an appropriate unit of analysis. – A tweet with a hyperlink that is not active will be coded as not an appropriate unit of analysis as it does not have the full information to code accurately. – Additionally, any tweet that does not show in the DiscoverText tweet display is a sign that it has been deleted by the user and therefore does not include all of the necessary content to code in full so it will be counted as not an appropriate unit of analysis. – A tweet that is an appropriate unit of analysis in that it is not spam and/or does not include deleted information but does not make a reference to the Gatlinburg fires in any way will be coded as appropriate unit of analysis.
Who is the user?	<ul style="list-style-type: none"> – The owner of the Twitter handle or profile is defined as the user. – For the purposes of this study, only tweets by individuals were used in the analysis; however, the other categories of user were coded for potential use in further research. <hr/> <ul style="list-style-type: none"> – Individual users are categorized as a single person. Individuals in this category are ‘everyday’ people – citizens, neighbors, etc. Individual users are those who are not categorized by any other category. <hr/> <ul style="list-style-type: none"> – Celebrity users are categorized as actors, musicians, or other individuals with an extremely large following and a verified Twitter account. This also includes celebrity groups such as bands or a cast of actors. <hr/> <ul style="list-style-type: none"> – News/Media Outlet users are categorized as any news/media outlet or reporter whether it be broadcasted via internet, television, radio, or in print. <hr/> <ul style="list-style-type: none"> – Traditional Service Organization users or individuals identified as members of fire, police, emergency rescue, park ranger, or similar departments. <hr/> <ul style="list-style-type: none"> – Government Agency users or individuals identified as public officials such as a town or municipality’s official Twitter

Variable	Description
	<p>platform. This also includes users such as the National Weather Service or Department of Transportation.</p> <ul style="list-style-type: none"> – Business users or individuals classified as any for-profit business such as a restaurant, dentist office, or car dealership, for example. – Non-Profit/Aid-related Business these users are such entities as the Red Cross or a local humanitarian center. – Not Sure. Any other user that does not fit into any of the listed categories is housed in the ‘not sure’ category.
Content of the Tweet.	<ul style="list-style-type: none"> – The crux of this study is to learn the type of content of the Gatlinburg wildfire related tweets. – Informative/Informational content will any content that refers to news pertaining to the Gatlinburg wildfires. This includes but is not limited to road closings, locations of fires, power outages, notifications of individual safety and the like. The sharing of photographs and videos of the fires and the aftermath would fit into this category. – Social content will include the sharing of heartfelt thoughts or personal statements. Messages in this category might include but is not limited to content such as “Sending love to Gatlinburg”; “Please Stay Safe Tonight”; “My heart is broken”; or similar statement. – Distractive/Distractio content includes content that is intended to shift attention from the topic. It includes content such as hate or political speech or something more ‘fun’ such as jokes or humorous memes. It also includes content that does not fall into one of the first two categories. This category also houses any content that does not fit within the Informational or Social categories.
Geolocation.	<ul style="list-style-type: none"> – The tweets were separated into three groups: local, regional, and non-local. – A 20-mile radius for the local group was chosen as the county of Sevier is a closely matches that of the 20-mile radius of Gatlinburg. – Tweets gathered in this area are labeled as local. – The entire Appalachian Region, which includes a205,000 square-mile region that followed the Appalachian Mountains from southern New York to northern Mississippi is qualified as regional. Any tweets gathered from this area are labeled as regional. – Any tweets that were not labeled local or regional were listed in the non-local group.

Variable	Description
Type of Tweet	<ul style="list-style-type: none"> – An original or native tweet consists of content that is original content by the user. – A Retweet consists of content that has previously been posted and is simply being reposted by a new user. – This may be somewhat tricky to navigate as in some cases; a user may remove the @RT text that signifies the content is being forwarded from an already published message. – The new poster may or may not add original content. – Coders addressed this as during the reliability/practice sessions and made a decision on how to code for obviously retweeted content. – Any hyperlink that included “twitter.com” as part of the URL was considered a retweet. – If the hyperlink was from a source other than Twitter, it was considered an original tweet.
Additional content	<ul style="list-style-type: none"> – Images are photos or pictures that are hyperlinked or embedded within the tweet visual. – Videos are videos (auto play or not) that are hyperlinked or embedded within the tweet visual. – Hyperlinks/Links are URLs that are clickable within the tweet visual and take the reader to a new window. This could be but is not limited to a news article, an Instagram post, or a website. – Other Hashtags are any other #hashtags that are listed within the tweet or retweet, not including the six originally searched hashtags. The originally searched #hashtags are: #gatlinburg, #gatlinburgwildfire, #gatlinburgwildfires, #GSMNP, #smokeymountains, #prayforgatlinburg