Houston College Sport Programs' Hurricane Harvey Communication: A Twitter Content Analysis

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Abstract: This study provides a Twitter content analysis of tweets by Houston-based Division I college sport programs during Hurricane Harvey. A content analysis was performed on the tweets appearing on the main intercollegiate athletics Twitter pages of University of Houston, Houston Baptist University, Prairie View A&M University, Rice University, and Texas Southern University in response to Hurricane Harvey. The researchers based their study on grounded theory informed by a study conducted by Inoue and Havard (2015). While this study examined tweets rather than newspaper and magazine articles like Inoue and Havard (2015), this study confirmed the theme findings in Inoue and Havard (2015) applied well in a Twitter social media setting as well. New themes that were added by the researchers in the current study proved to be applicable.

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Hurricane Harvey did not hit Houston directly in August 2017, but the storm brought enough sustained rainfall to the city to generate record-setting damage. Among the records established by Hurricane Harvey was a new mark for the most rainfall of any tropical cyclone in history with more than 60 inches in rainfall (Whittal, 2018). According to National Oceanic and Atmospheric Administration (NOAA) estimates, Hurricane Harvey did $125 billion in damage: a figure that tied Hurricane Katrina as America's costliest cyclone (Whittal, 2018). Hurricane Harvey killed 68 people, including 36 from the Houston metropolitan area (Whittal, 2018). The purpose of this paper is to examine how Houston's NCAA Division I sport programs used Twitter in response to the weather crisis generated by Hurricane Harvey in the Houston area in August and September of 2017.

Twitter is a social media platform that has become an incredibly popular micro-blogging service. It grew from 30 million users in first quarter 2010 to 335 million users in second quarter 2018 ("Number of monthly," 2018). College sport programs utilize their Twitter page to share information with important stakeholders including consumers, alumni, donors, students, community members, and others.

Researchers conducted a large study of peer-reviewed articles tied to anthropogenic global warming (Cook et al. 2013) to assess the scientific community's position on global warming. The abstracts of the 11,944 peer-reviewed articles the researchers reviewed showed there is strong agreement in the scientific community regarding global warming with 97.1% of abstracts that took a position on global warming agreeing that human activity contributed to global warming (Cook et al. 2013). Powell (2015) conducted a similar study tied to articles from 2013 and 2014 and found that 99.9% of 69,406 authors of peer-reviewed articles on anthropogenic global warming believed humans contribute to global warming. Therefore, the debate about whether global warming exists and whether humans contribute to it seems to have been resolved in the scientific community. The anticipated growth in both the frequency and the magnitude of extreme weather events (Panteli & Mancarella, 2015) makes plans related to global warming, climate change, and extreme weather events increasingly important.

There were five Division I universities located in Houston at the time of Hurricane Harvey. These universities included: (a) University of Houston: a state university and a member of the American Athletic Conference; (b) Rice University: a private university and a member of Conference USA; (c) Houston Baptist: a private university and a member of the Southland Conference; (d) Texas Southern: a historically Black university and a member of the Southwestern Athletic Conference; (e) Prairie View A&M: a historically Black University and a member of the Southwestern Athletic Conference. The Twitter content for the main intercollegiate athletics account for each of these universities was examined in the current study. The researchers performed a content analysis of 252

tweets from the five Houston Division I intercollegiate athletics programs' main Twitter pages gathered between August 24, 2017, the date of the first Hurricane Harvey related tweet from these programs, and September 21, 2017 when tweets had clearly dissipated. This resulted in a four-week period of study. Sport media professionals, whose intercollegiate athletics programs could deal with a similar extreme weather crisis in the future, would benefit from an enhanced understanding of the content in these tweets. Academic professionals will also benefit from this research if it matches a specific classroom need or contributes to future research as the frequency and magnitude of these extreme weather events grow. The purpose of this paper is to examine how Houston's NCAA Division I sport programs used Twitter in response to the weather crisis generated by Hurricane Harvey in the Houston area in August and September of 2017.

Literature Review

Social Media Versus Traditional Media and Twitter Use in Sport Studies

Social media and traditional media are not the same. Twitter, which is at the heart of the current study, is a social media platform. To understand how a consumer compares social media platforms versus traditional media platforms, several academic studies were considered.

Gainous, Abbott, and Wagner (2018) found that the more individuals trust a media format, the more frequently they will return to that medium to acquire more information. In addition, they found trust in traditional media grows with a trust in government, while trust in social media grows with a lack of trust in government. A study by Xu (2020) found social media responses to a preventable crisis are harsher than they are toward accidental crises. However, social media was found by Xu (2020) to be more forgiving of the crisis causer, with traditional media users placing more responsibility on crisis causers than social media users. Freberg, Saling, Vidoloff, and Eosco (2012) reviewed crisis communication literature and determined good crisis communication messages must be quick, credible, accurate, simple, complete, and broadly communicated. Twitter is obviously quicker, simpler, and less complete than traditional media and it has a broad platform. Newspapers, for a traditional media example, would be more complete and more complex, but much slower and the area covered would depend on the newspaper. As previously noted, people have differing opinions on traditional media versus social media credibility based on government trust (2018). Accuracy would obviously vary by provider. Twitter is popular for its speed and simplicity and Freberg, et al. (2012) note that organizations must be prepared to communicate with key stakeholders during a time of crisis.

Sport Twitter content analysis studies are not uncommon (Doran, Cooper, & Mihalik, 2015; Hambrick,

Simmons, Greenhalgh, and Greenwell, 2010; Wang & Zhou, 2015; Zimmerman, Johnson, & Ridley, 2016). Studies of college sport Twitter content analysis include the studies of Doran, et al. (2015) and Zimmerman, et al. (2016). The former college sport content analysis study made recommendations for best practices for NCAA Division I track coaches' tweets based on an examination of past track coach tweets (Doran, et al., 2015). The latter college sport content analysis study documented the content of NCAA Football Bowl Subdivision football coaches' tweets (Zimmerman, et al. (2016).

There are other sport and Twitter content analysis studies (Hambrick, et al., 2010; Wang and Zhou, 2015) beyond the previously mentioned college sport studies. In one study, researchers coded professional athletes' tweets in terms of six categories: (a) content; (b) diversion; (c) fanship; (d) information sharing; (e) interactivity; and (f) promotion (Hambrick, et al., 2010). In another study, researchers considered how social media can be utilized in the establishment of consumer relationships by evaluating NBA team tweet content (Wang and Zhou, 2015).

There are additional sport and Twitter studies of various types (Clavio, Burch, & Frederick, 2012; Clavio, Walsh, & Coyle, 2013; Sanderson & Gramlich, 2016). One study used Twitter to analyze a Big Ten football team's social network (Clavio, Burch, & Frederick, 2012). Another study evaluated how gender influences people's perceptions of professional sport team tweets (Clavio, Walsh, & Coyle, 2013). A study of Twitter content surrounding Becky Hammon's hiring as the National Basketball Association's first female, full-time, paid assistant coach yielded three themes: (a) conversation space creating tweets; (b) tweets offering evidence that the hiring was part of sport social change; and (c) tweets showing resistance to social change.

There is more than ample material for an entire paper related to sport Twitter studies. This fact, tied to the absence of studies related to college sport program Twitter use in times of crisis, such as weather and natural disasters, provided the researchers with strong support for performing a Twitter content analysis of Houston college sport program tweets tied to Hurricane Harvey. There is a clear gap in the literature review that this article will fill in terms of college sport program Twitter use in times of weather and natural disaster crisis communication.

Twitter Use in Response to Terror and Weather Crises

Because there were no articles concerning sport teams using Twitter in response to severe weather crises or natural disaster phenomena, a broad look at the use of Twitter in response to terror and weather crises was conducted. The intent was to see if sport organizations or business organizations used Twitter in response to terror and weather crises and generated themes that may be applied to the current study's content analysis. While

we could find no articles of that type, we will share information on the most closely related articles to further demonstrate the hole in the literature the current study fills.

The closest article to this study that utilized Twitter was penned by Wang and Zhuang (2017). That article performed a content analysis of tweets from governmental organizations and non-governmental organizations following Hurricane Sandy. The government response tweets generated themes related to topics such as the Army, foreign affairs, agriculture and other things that were unlikely to appear in a college athletics department's tweets. Similarly, the non-governmental tweets yielded themes including animal protection that were unlikely to appear in the current study. So even the closest fit among these articles did not help to inform a sport single-organizational response to a hurricane.

Articles related to the 2013 Boston Marathon bombing tied Twitter to a terror-based sport crisis, but also failed to inform a sport single-organizational response to a hurricane. Both the Lee, Agrawal, and Rao (2015) and Williams, Woods, and Staricek (2017) Twitter studies had a focus that differed from this study. The former study focused on analyzing rumor and non-rumor general public Tweets in response to the bombing. The latter study took a crisis management analytical approach to the leadership methods of Boston Mayor Thomas Menino following the bombing. Menino was in the role of an individual community leader, rather than that of a sport organization tied to a university, and his tweets were analyzed for changes in tone throughout the crises rather than a thematic analysis. Therefore, these articles also failed to truly inform the current study in terms of theme generation.

Articles related to the use of Twitter in response to terror in Jakarta in 2016 (Brajawidagda, Reddick, & Chatfield, 2019) and Stockholm in 2017 (Tikka, 2019) were also considered. The former study examined the use of Twitter by the police to provide facts and negate rumors during a time of crisis in addition to examining newspaper story content related to the 2016 Jakarta terror attack. The latter study focused on citizen tweets in response to the 2017 Stockholm terror attack. Again, neither study provided information that would inform the themes in the current study.

Sport and Severe Weather or Natural Disaster Phenomena

Consumers often utilize sport to remove themselves from the difficulties they face each day (McDonald, Milne, & Hong, 2002; Kim & James, 2019). Because sport helps to shape both society and the people that make up that society and the reach of sport includes political alliances and social order (Gift & Miner, 2017), a study of sport and its role with severe weather and natural disaster phenomenon may be a departure from sport's role

as distraction. However, researchers have found big business involvement plays a key role in a nation's health in times of disaster (Ballesteros, Useem, & Wry, 2017). Therefore, an examination of sport's relationship with severe weather or natural disaster phenomena is quite logical.

Researchers have examined sport's impact on local environments and economies (Chapin, 2004; van Holm, 2018). However, few studies focus on the impact of climate on sport, with nearly all those studies published since 2010 (Orr & Inoue, In press, Sport versus climate, para. 5-7). Global warming is expected to generate extreme weather events in greater numbers and with greater intensity (Panteli & Mancarella, 2015). This should lead to additional studies in this area. Those future studies of sport and severe weather or natural disaster phenomena will benefit from several existing studies. Studies of Hurricane Katrina (Baade & Matheson, 2007; Grano & Zagacki, 2011; Lawrence, 2008), Superstorm Sandy (Marks, Martin, & Warner, 2014), Hurricane Irma (Fortunato, 2018), and a study that examined numerous disasters that had implications for sport (Inoue & Havard, 2015) have followed these extreme events.

Researchers have questioned the role sport played in economic recovery (Baade & Matheson, 2007, p. 602) while asserting the National Football League's New Orleans Saints and similar sport entities would be more accurately described as a symbol of city vitality. Economists have stated spending on sport as entertainment slows economic recovery while building on athletics infrastructure, such as Tulane University athletics facilities following Hurricane Katrina, was described as a superior long-term expenditure (Baade & Matheson, 2007). Another Hurricane Katrina and sport researcher said the Saints "supplied an impetus for transcendence and healing" (Lawrence, 2008, p. 90). Social identity with the team, in this case the Saints, was described as playing a role in group-based self-esteem that can combine with individual processes, such as internalization of team success to strengthen personal resilience (Lawrence, 2008). Essayists conveyed the conflicting messages sent by the New Orleans Saints' return to the Superdome for Monday Night Football following Hurricane Katrina (Grano & Zagacki, 2011). The essayists said the positivity of the Saints' return was portrayed against the backdrop of pictures and words tied to Superdome crime and peril during Hurricane Katrina when the facility served as a dangerous temporary home to area citizens. Therefore, a mix of positive and negative messages can be found in the academic articles that bonded sport and Hurricane Katrina.

The impact of Superstorm Sandy on the New York Marathon was examined in a case study (Marks, et al., 2015). The event was schedule for November 4th. Superstorm Sandy hit land on October 29th. Runners train for the event on an ongoing, long-term basis; there was no precedent for event cancellation. However, New York City Mayor Michael Bloomberg made the decision that available city resources should be dedicated to the

weather emergency rather than the road race. As a result, the New Your Marathon was cancelled for the first time. Fortunato (2018) studied the National Hockey League's Florida Panthers and their response to Hurricane Irma. Panthers' owner Vincent Viola flew players, families, and their pets to Boston, via chartered jet, to remove them from the storm's path. The team made a $1 million donation to Irma relief and recovery efforts. The Panthers housed 2,500 Florida Power & Light workers who were dedicated to the recovery effort and provided food and water to impacted citizens (Fortunato, 2018).

In a study that in many ways echoed elements of the previously mentioned New Orleans Saints study by Lawrence (2008), researchers who examined the aftermath of the 2011 Great East Japan Earthquake found people link social well-being with team identification (Inoue, Funk, Wann, Yoshida, & Nakazawa, 2015). The researchers identified a positive relationship between hometown team identification and post disaster community cohesion. Teams should consider the important psychological effects of their behavior on fans and citizens when their area is impacted by a natural disaster or weather crisis.

Sport also engages with disasters or terrible events that are unrelated with severe weather or natural disaster phenomena. These events include the Palestinian terror group taking Israeli national team members hostage during the 1972 Munich Games that led to 10 deaths, as well as the 1996 Atlanta Games Centennial Park bombing and the 2013 Boston Marathon bombing (Galily, Yarchi, & Tamir, 2015). Boston Marathon social media mentions were at about 10,000 per hour, prior to the first bomb explosion. Those mentions climbed to more than 900,000 social media mentions per hour about 70 minutes later (Galily, et al., 2015). Another study considered how MLB's Red Sox, the NHL's Bruins, and other Boston sport entities responded to the Boston Marathon disaster (Finch, 2016). Researchers also examined the civil unrest during Northern Ireland's 2013 World Police and Fire Games. They found Northern Irish citizens who learned of the civil unrest sought support from the social media platforms tied to the event (Devine, Boluk, & Devine, 2017). When the citizens discovered a lack of calming information on the 2013 World Police and Fire Games social media platforms, it generated a negative impression reinforcement that led the citizens of Northern Ireland to feel less safe (Devine, et al., 2017). That study informed the current study, as it provided evidence that citizens seek positive messages from local sport entities during times of trouble.

While the Devine et al. (2017) article clearly informed the current study, the academic journal article that most informed this study was a content analysis study of newspaper and magazine articles that paired sport with disaster relief efforts (Inoue & Havard, 2015). The researchers analyzed the content of 70 sport and disaster relief articles. The researchers identified 11 forms of activity teams and players engaged in when confronted with these disasters. The researchers identified 8 tangible support activities and three emotional support activities.

Tangible support activities included cause-related marketing, fundraising, in-kind donations, matching donations, monetary donations, public service announcements, shelter, and volunteering. The researchers defined cause-related marketing as items sold to generate funds for a cause. Fundraising referred to the act of generating financial gifts, and matching donations meant matching the cash provided by another gift. In-kind gifts referred to the receipt of items, other than cash, for use in the relief effort. Monetary donations referred to direct cash gifts made by the sport organization itself. The researchers deemed messages that encouraged others to donate as public service announcements. Shelter was the term used for providing a safe roof to relief workers and storm victims. The term volunteering was used to describe direct sport organization relief work tied to the disaster (Inoue & Havard, 2015).

The emotional support activities were community outreach programs, memorials, and site visits (Inoue & Havard, 2015). The researchers defined community outreach programs as community initiatives to provide disaster relief. The sport organizations defined memorials as things like spoken or written words, or an appearance in support of victims, responders, and organizations. Site visits occur when the sport organization goes to the disaster location (Inoue & Havard, 2015).

The Inoue & Havard (2015) content analysis study of magazines and newspapers did not examine social media, but it did provide strong insights that could be utilized in the current study. Of course, a major difference is that sport organizations generally control their social media content, which stands in contrast to magazine and newspaper articles that generally come from sources beyond sport organization and player control. The current study is delimited to specifically focus on college sport teams and their response to severe weather or natural disaster phenomena. The current study fills an important gap in the literature by examining sport organizations' direct crisis communications through social media in a time of weather crisis or disaster relief. Specifically, the current study examines college sport team Twitter usage tied to Hurricane Harvey.

Theories Related to Crisis Communication

The researchers identified and reviewed various weather studies that used communication theories. Unfortunately, none of these theories aligned with the circumstances examined in the current study of college sport social media response to extreme weather disasters. Therefore, an informed version of grounded theory was utilized that will be described in further detail.

While two studies of Twitter use during hazardous weather events applied the Crisis and Emergency Risk Communication model (Lachlan, Spence, Lin, Najarian, & Del Greco, 2016; Panagiotopoulos, Barnett, Bigdeli, & Sams, 2016), this model is focused on governmental emergency alert operations. This model is not adaptable

to sport scenarios, such as the one considered in the current study. The researchers also considered uncertainty reduction theory. That theory examines interactions between people seeking to remove or minimize the unknown from themselves as well as others (Berger & Calabrese, 1975; Bradac, 2001). However, removing or minimizing the unknown is not the focus of the current study. Earlier in the literature review, the researchers mentioned a study of Japanese sport fans' social well-being after an earthquake (Inoue, et al., 2015). That study utilized the cognitive theory of psychological stress and coping (Inoue, et al., 2015). The cognitive theory of psychological stress and coping considers individual stress response, rather than sport team crisis or natural disaster communication. Research has indicated crisis communication theory often focusses on organizational damage control instead of considering positive crisis communications (Madden (2015). The current study was not focused on an internally generated crisis; instead, the focus was on sport organizations' crisis communications response to an external weather event beyond the control of sport organization. Finally, Liu, Bartz, and Duke (2016) reported crisis communication and uncertainty was "largely atheoretical" (p. 483) due to a lack of research in this area. The current study will help to create more literature in this area in acknowledgement of the need for research, as stated by Liu, Bartz, and Duke (2016).

After examining all the crisis communication theories used in studies of weather crises and natural disasters, grounded theory clearly emerged as the best option. However, the researchers working on the current study found the Inoue and Havard (2015) study of newspaper and magazine articles tied sport to disasters to be informative and potentially applicable to the current study. Therefore, the researchers settled on the use of grounded theory, informed by the Inoue and Havard (2015) study.

While the 11 activity codes in the Inoue and Havard (2015) study would be informative, the literature indicated several other codes that would apply to the current social media study focused on sport communication crises and natural weather disasters. Inoue, et al. (2015) found there was a positive relationship between hometown team identification and post disaster community cohesion. This led the researchers to add a bonding activity code in order to capture activities involving the sport team bonding with the community. In addition, the Devine, et al. (2017) article about Northern Ireland's 2013 World Police and Fire Games article stated the absence of information in a time of crisis negatively impacted public perception of Northern Ireland unrest. As a result, the researchers added an "information" code to the current study to address possible tweets related to game cancellations, venue changes, weather updates, and similar tweet content. The researchers also added an "other" category to address tweets that did not fit into any of the 11 Inoue and Havard (2015) activity codes or the new bonding and information codes.

The articles that were reviewed left a gap in the literature. While there are articles that tie sport and Twitter, articles that tie crises and Twitter, and articles that tie sport and crises, there are no articles that focus on a sport

organization's use of Twitter during a weather crisis. Therefore, the current article builds upon that literature by filling a void in the combination of sport organizations, Twitter, and weather crisis: a combination we should expect to see more often as these weather crisis events grow in number and magnitude (Panteli & Mancarella, 2015). Therefore, the literature review led the researchers to ask the following questions:

RQ1: How well do the Inoue and Havard (2015) activity codes for sport team and player disaster response apply to Houston college sport programs' tweets made in response to Hurricane Harvey?

RQ2: Would the new activity codes—bonding, information, and other—that the researchers added based on gaps in the literature prove to be valid?

Method

After a process of eliminating all other options through literature review, the researchers determined that grounded theory was appropriate for use in the current study. Grounded theory provides researchers with qualitative data management techniques that create the opportunity to manipulate qualitative findings for quantitative analysis (Charmaz, 2008). For this study of Houston intercollegiate athletics programs' tweets in response to Hurricane Harvey, the researchers concluded that grounded theory, informed by the Inoue and Havard (2015) sport and disaster relief content analysis study, provided the best study environment, particularly with the additional codes supplied by the researchers.

Tweets appearing on the main intercollegiate athletics Twitter pages of University of Houston, Houston Baptist University, Prairie View A&M University, Rice University, and Texas Southern University in response to Hurricane Harvey were coded and analyzed in this study. These tweets occurred during a four-week period from the date of the first Harvey-related tweet, August 24th, to September 21. A total of 252 tweets fit the study's criteria, and those tweets were coded for analysis.

Rhetorical Analysis/Tweet Samples

This section will examine qualitative examples of Houston intercollegiate athletics program tweets to provide the reader with a sense of what the coded data looked like, before exploring the quantitative results found in the results section. A brief explanation of why each code was assigned to each tweet is expressed. The purpose of this section is to provide both qualitative and quantitative data, which adds rigor to the current study while also giving future researchers a roadmap to follow in similar studies.

Example 1: Tweet of August 25, 2017 10:55 AM,

Style: Direct, Content: UPDATE - All on-campus

athletics activities for this weekend have been

cancelled. We hope everyone stays safe. Go Owls!

Example 1 was a Rice University tweet explaining the suspension of all athletics activities. The sentiment to stay safe has bonding elements, but the major focus of the message is the information being dispersed related to the cancellations. Therefore, this was coded as an information tweet.

Example 2: August 26, 2017 3:25 PM, Style:

Direct, Content: We're safe from Hurricane

Harvey & hope ya'll are too! We now look

forward to tonight's big @CFSydneyCup

game in Sydney!

Example 2 was a Rice University tweet that opened with a statement that the football team was safe and with hope expressed that the people reading the tweet, many of whom would clearly be from Houston, are safe as well. The second line contains information about where the team is and why it is in Sydney. However, that information is not the focus of the tweet. The lead and focus of the tweet is the statement regarding safety and the wish that all are well, connecting the team to its fans and resulting in a bonding code.

Example 3: August 28, 2017 5:14 PM, Style:

Retweet of Rice TF & XC (@RiceTFXC),

Content: Members from MT&F made it down

to the George R. Brown Convention Center to

volunteer and lend a helping hand.

Example 3 was a Rice University retweet of Rice University track and field and cross country tweet. The tweet included a photo of Rice men's track and field and cross country student-athletes volunteering at the George

R. Brown Convention Center in support of Hurricane Harvey disaster relief efforts. This clearly qualified as a volunteer code.

Results

Three researchers engaged in the coding of all 252 tweets. After the initial round of coding, the researchers recorded a 93% interrater reliability clip by matching on 235 of 252 codes. The researchers resolved coding conflicts for the 17 cases that did not originally match by discussing each case until proper code agreement was reached.

Houston's five intercollegiate athletics programs used their main Twitter pages to communicate information related to Hurricane Harvey. Rice University was easily the most active intercollegiate athletics program in terms of Hurricane Harvey related tweets. Of the 252 total tweets related to Hurricane Harvey from the five Houston NCAA Division I intercollegiate athletics programs during the four weeks the researchers examined, 119 tweets (47%) emanated from Rice University. The University of Houston issued 60 tweets followed by Prairie View A&M (33), Houston Baptist (21), and Texas Southern (19). While all of the athletics programs in the current study are NCAA Division I universities, it is not surprising to see Football Bowl Subdivision schools, such as Rice and Houston, atop the list, followed by historically black universities Prairie View A&M, Houston Baptist, and Texas Southern, likely due to differences in revenue and human resources.

The top overall code was information, with 98 tweets. This is not surprising because the Houston NCAA Division I intercollegiate athletics programs are part of public universities that have a public/political role that is not found in privately held professional sport entities. These universities house students and employ large university staffs who depend on the information that comes from the university. Because the intercollegiate athletics programs draw great attention and have great followings, it makes sense for them to incorporate information related to an area disaster into their communications mix Bonding (51) was the next most utilized code, followed by public service announcement (27), in kind giving (25) memorial (20), volunteer (19), and marketing (12). This meant half of the available codes were utilized in this study, led by the two codes generated by the current study's researchers based on the literature.

According to an article that documented the track of Hurricane Harvey, the storm made a move toward Houston on August 27th (Ehrlich, 2017). As a result, it is not surprising to see a leap in the number of Hurricane Harvey related tweets from five to 15 between August 26th and 27th. Another jump to the high mark of 31 tweets occurs on August 28th. Hurricane Harvey related tweets from the five programs remains above 15 from August

27th to September 1st, before dropping to 10 tweets on September 2nd. Twitter activity related to Hurricane Harvey from the five athletic programs only surged above 15 one other time (September 7th, with 16 tweets), after the flurry of tweets that marked Hurricane Harvey's arrival in Houston. The programs only used their main athletics Twitter page to send tweets twice in the last four days of the study, including once on the final day of September 21st.

In summary, we refer to our research questions:

RQ1: How well do the Inoue and Havard (2015) activities codes for sport team and player disaster response apply to Houston college sport programs' tweets made in response to Hurricane Harvey?

There is no question that the Inoue and Havard (2015) activities codes were effective because those codes, along with the codes provided by the researchers conducting the current study, allowed every tweet to be coded. While just five of the 11 Inoue and Havard (2015) codes were utilized, Hurricane Katrina's use of the Superdome would have used their shelter code, which was not utilized here. It is easy to imagine monetary, fundraising, and matching codes being used in other settings. A visit to the site of the damage under certain circumstances would also makes sense, as would outreach to community programs involved in recovery efforts. Therefore, the Inoue and Havard (2015) codes accounted for everything that was needed for the current study, as well as covering events that are easy to imagine for future weather-related disasters.

RQ2: Would the new activity codes—bonding, information, and other—that the researchers added based on gaps in the literature prove to be valid?

The researchers' used the literature (Devine, et al., 2017; Inoue, et al., 2015) to generate the bonding and information codes, which they combined with an "other" code to account for any tweet that did not fit with either the Inoue and Havard (2015) codes or the bonding and information codes. Information was the most frequently utilized code in the current study with bonding finishing as the second most-utilized code. In total, 149 of the 252 tweets (59%) were captured by the information and bonding codes generated in this study from the literature. The "other" catchall code was not required in the current study, due to the effectiveness of the other 13 codes. However, it is reasonable to imagine the need for this type of catchall code in future studies for occasional tweets that do not fit an existing code.

Discussion

The university's main Twitter page would logically be the first place that people with close ties would visit

for important university tweets during a time of crisis. On the main university Twitter page students, alumni, faculty/staff, and other members of the general public people might learn about crisis conditions, closures, places of safety, and other disaster or extreme weather information. However, Houston's Division I intercollegiate athletics programs form a very public and powerful element on their respective University campuses. Because NCAA Division I athletics programs have vast reach, it would be logical for the university to expect the athletics program to tweet important information during a time of crisis, such as an extreme weather event, whether it planned on doing so or not. However, as long as school is in session, a NCAA Division I athletics program likely has cancellations and rescheduled events to announce on its Twitter page, web page, and other social media sites as a minimal crisis communications response.

With that said, the Houston NCAA Division I intercollegiate athletics programs went above and beyond minimal informational tweets. Bonding was the second most popular tweet code, indicating the programs were reaching out to the community in its time of need. Given previous sport and event findings that there are emotional and social well-being benefits (Inoue, et al., 2015) as well as the informational benefits (Devine, et al., 2017) of these disaster-related communication activities, it is good to see each of these athletics programs both communicated important information and worked to generate a bond with the community during this extreme weather event.

The researchers added bonding and information codes, as well as the "other" catchall code, to the current study based on the literature. Those additions proved to be a critical addition to the Inoue and Havard (2015) sport and disaster codes that were generated by their study of magazine and newspaper articles, with information and bonding placing first and second among code use out of the 14 possible codes utilized by the researchers in the current study. The key distinction between the Inoue and Havard (2015) study and the current study is the former examined newspaper and magazine content while the latter coded Twitter content.

Some researchers may wish to make the leap to suggest the current study applies to social media. However, the current study's researchers would suggest these codes specifically apply to Twitter. The researchers recommend future studies of content generated by athletics programs during extreme weather or disaster related events via Facebook, Instagram, or other social media platforms if they wish to test these codes in other social media settings. Just as the magazine and newspaper codes left holes that the current study's researchers were able to fill using the literature, a study of Facebook or Instagram literature may reveal additional codes that would be needed for those social media platforms. For example, an Instagram study may focus on things like the hurricane itself, people in need, people providing relief, homes in the aftermath, etc., some that may be captured in the themes for this Twitter study and some that would fall into the "other" category, which may dismiss important information. It is easy to see how an Instagram theme for homes in the aftermath could prove to be one of the most used and important themes and missing

that fact by merely accounting for it in a general "other" category would be a major oversight in an academic study of that nature.

Researchers who desired more precise data could certainly divide the information code that was added to this study into more specific codes like event cancellations, venue changes (when games are moved to neutral or away venues to avoid the extreme weather conditions), and other information codes. It was not surprising to see the information code rank first in use, given the importance of athletic departments providing updates on teams that are out-of-town, game cancellations, scheduling changes, and other predictable points of information. Entering the current study, the researchers did not know how the information code would perform. Of course, some researchers may value more economical coding systems, while others value privilege more finite detail.

As previously stated, the other codes that were used in this study include public service announcement, which ranked third in usage, in kind donations, which ranked fourth, memorial, which ranked fifth, volunteer, which ranked sixth, and marketing, which ranked seventh of the seven utilized codes. There were no real surprises here. The researchers anticipated these codes would be utilized and they were. However, the researchers were surprised to see the codes monetary, fundraising, matching, shelter, visit, outreach, and other were not used. While in kind was used, meaning things like holding a clothes drive (which Houston coach Kelvin Sampson did), there were no direct monetary gifts, money matching gifts, or fundraising campaigns incorporated into the tweets. Shelter could have become an important topic if people had to be removed from a campus or a campus sport venue was used for shelter in the way New Orleans utilized the Superdome after Hurricane Katrina. It was surprising that visits to the damage were not included in the tweets. Finally, the researchers were shocked that each of the tweets was able to be accounted for without needing to utilize the "other" category.

One of the most valuable uses of the current study may be its value to practitioners. As previously noted, ongoing global warming is expected to both increase and intensify extreme weather events (Panteli & Mancarella, 2015). As evidenced by the fact that the researchers found very few articles about sport organizations taking a positive response to extreme weather phenomena, the current article and the codes utilized herein would give a sport management professional, sport public relations professionals, or sport social media professionals who rarely confront extreme weather events of this nature a set of possible areas that they should address. Fans will seek timely information (Devine, et al., 2017) from the team that has a calming effect and enhances their social well-being (Inoue, et al., 2015). This study should assist practitioners in providing that information, as well as the calming effect the community seeks.

Major goals of this study were to fill a void in the literature in terms of sport social media content analyses

of global warming-based weather crisis events and to provide practitioners themes for best practices, the latter as noted above. While Inoue and Havard (2015) provided a singular study relating sport to these events, their focus was on newspaper content and it observed multiple events to generate themes common across those events. The current study focuses on a singular weather crisis event. In adapting the work of Inoue and Havard (2015) to social media, the current study both shows the ability to apply the previous model to a singular weather crisis event and also adds new themes that proved to capture a great amount of the social media content that would not have fallen into the existing Inoue and Havard (2015) themes. As indicated earlier in this article, the frequency and magnitude of these weather crises should continue to grow (Panteli & Mancarella, 2015). Therefore, we expect there will be opportunities for this area of the literature to continue to grow and opportunities for practitioners who must prepare for approaching weather events to apply these themes to their public relations planning.

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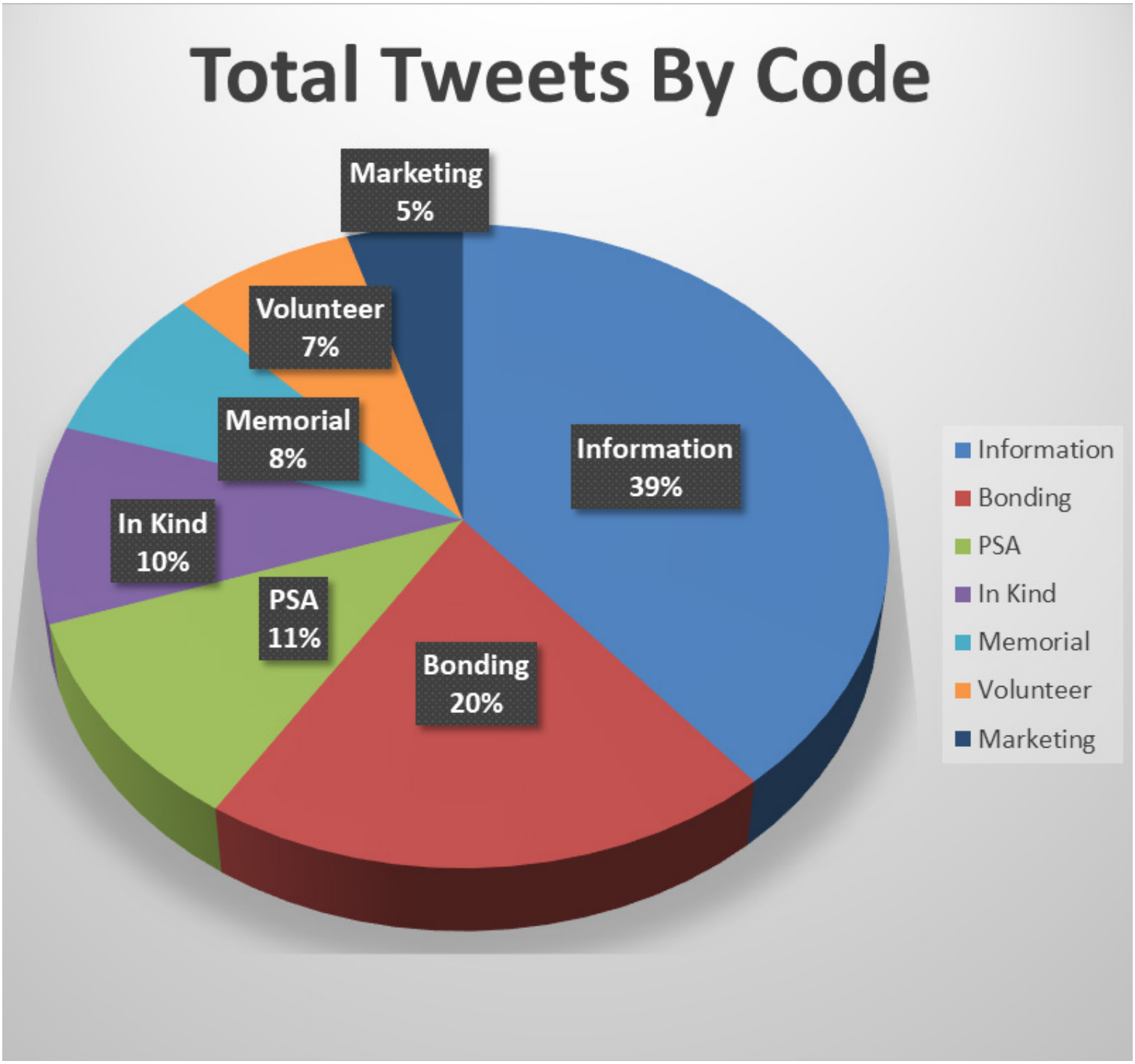
Appendices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Volunteer 7%
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In Kind 10%
PSA 11%
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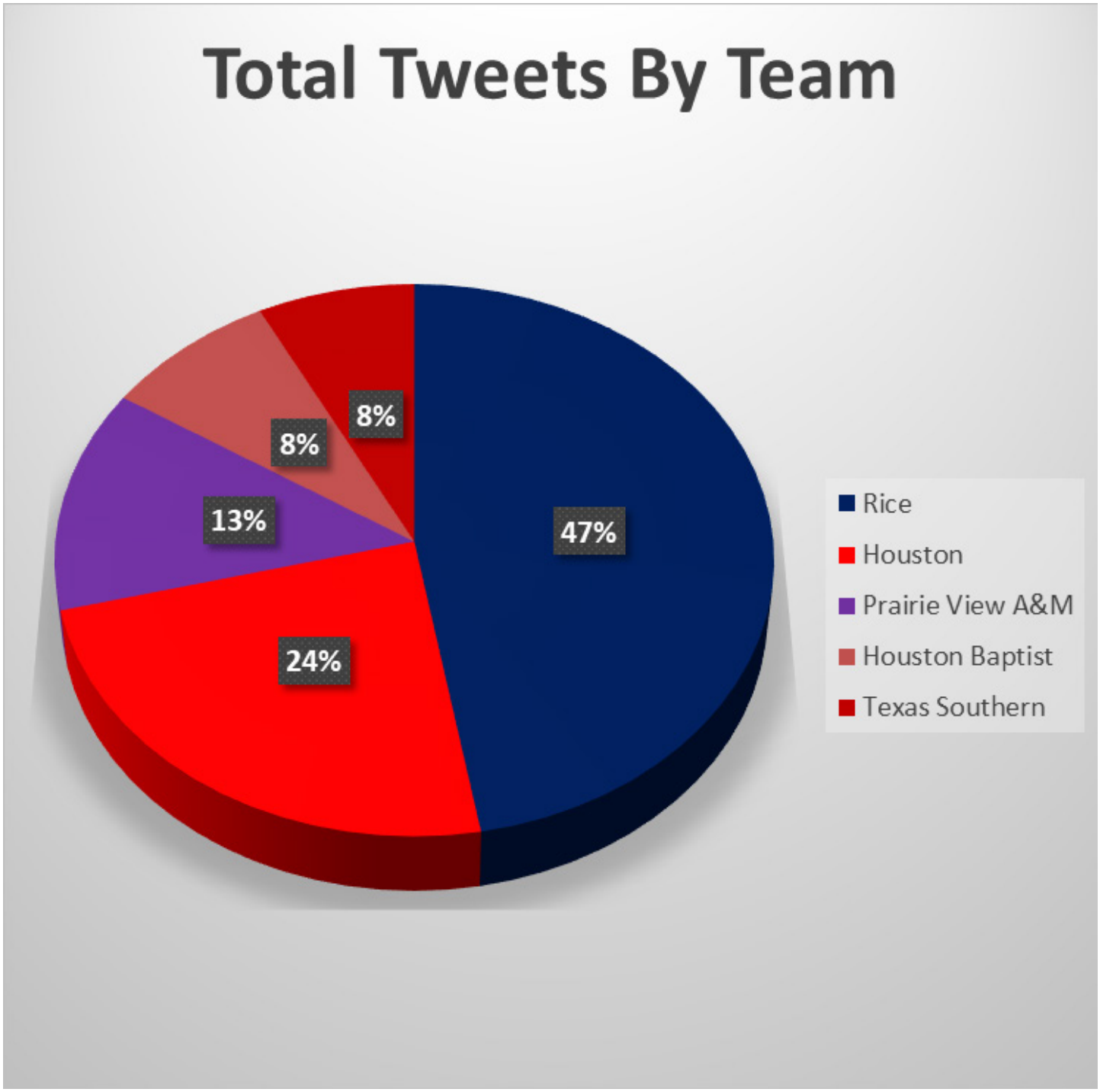
In Kind
Memorial
Volunteer
Marketing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8%
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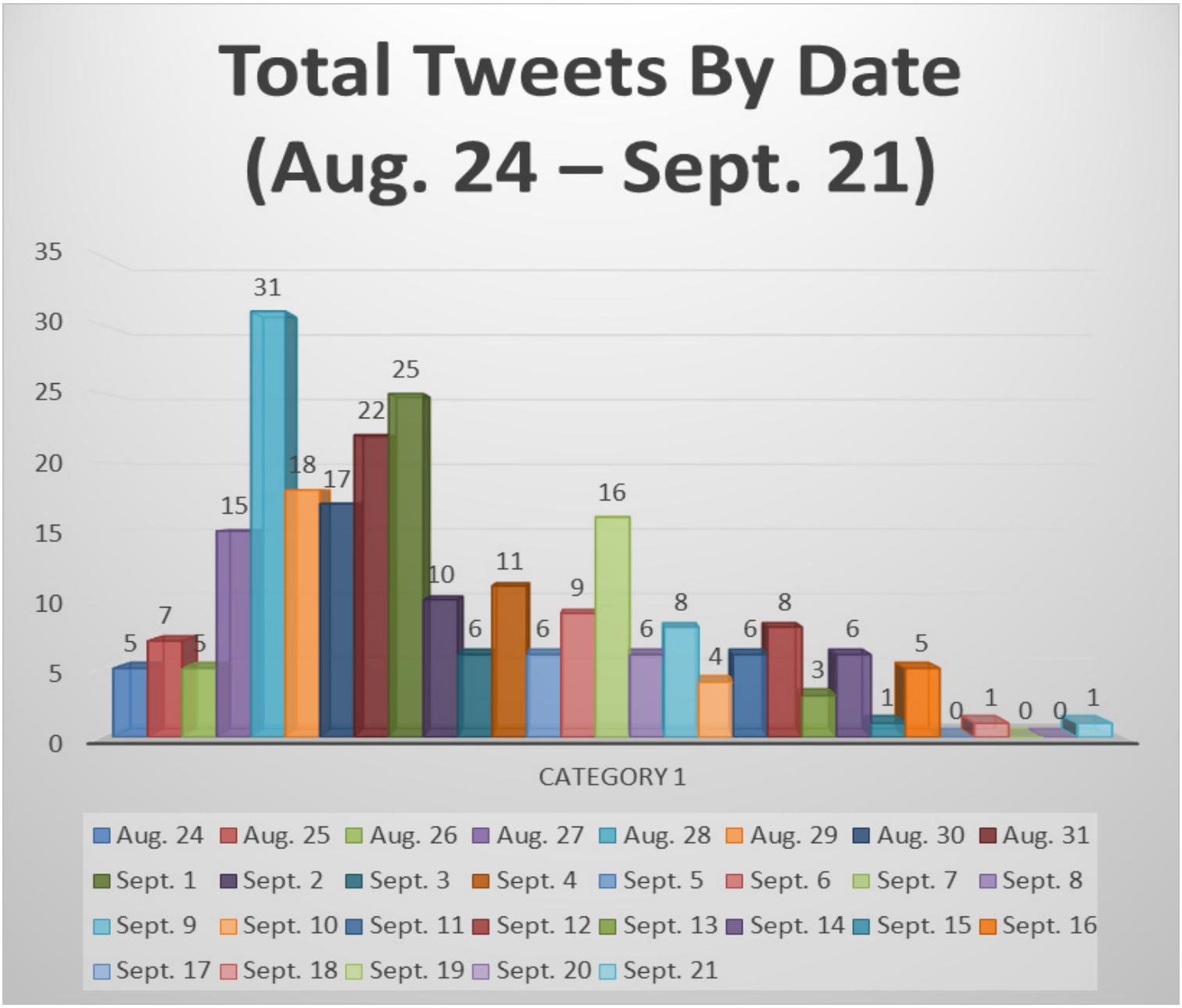
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CATEGORY 1
Aug. 24
Aug. 25
Aug. 26
Aug. 27
Aug. 28
Aug. 29
Aug. 30
Aug. 31
Sept. 1
Sept. 2
Sept. 3
Sept. 4
Sept. 5
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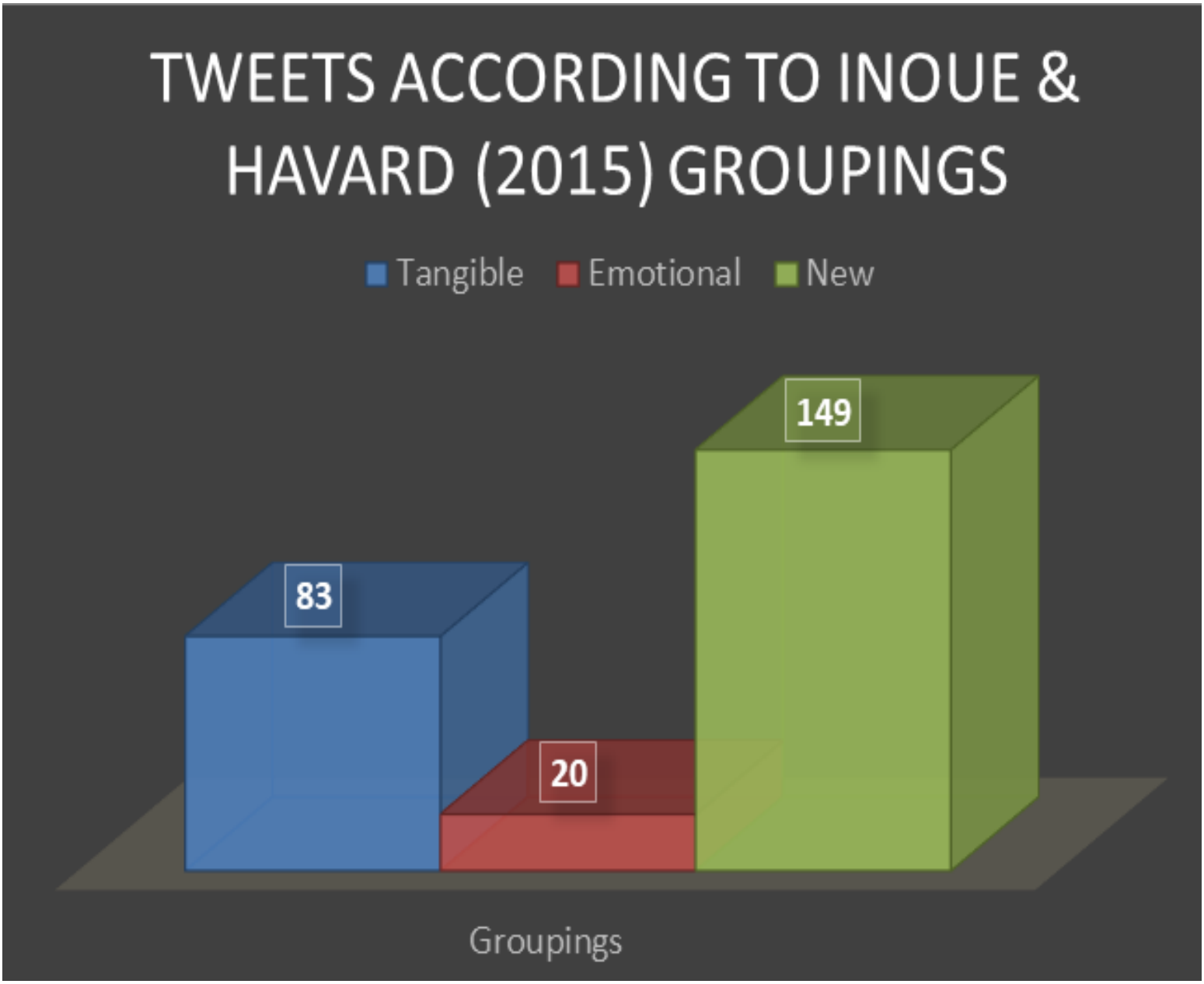
Sept. 21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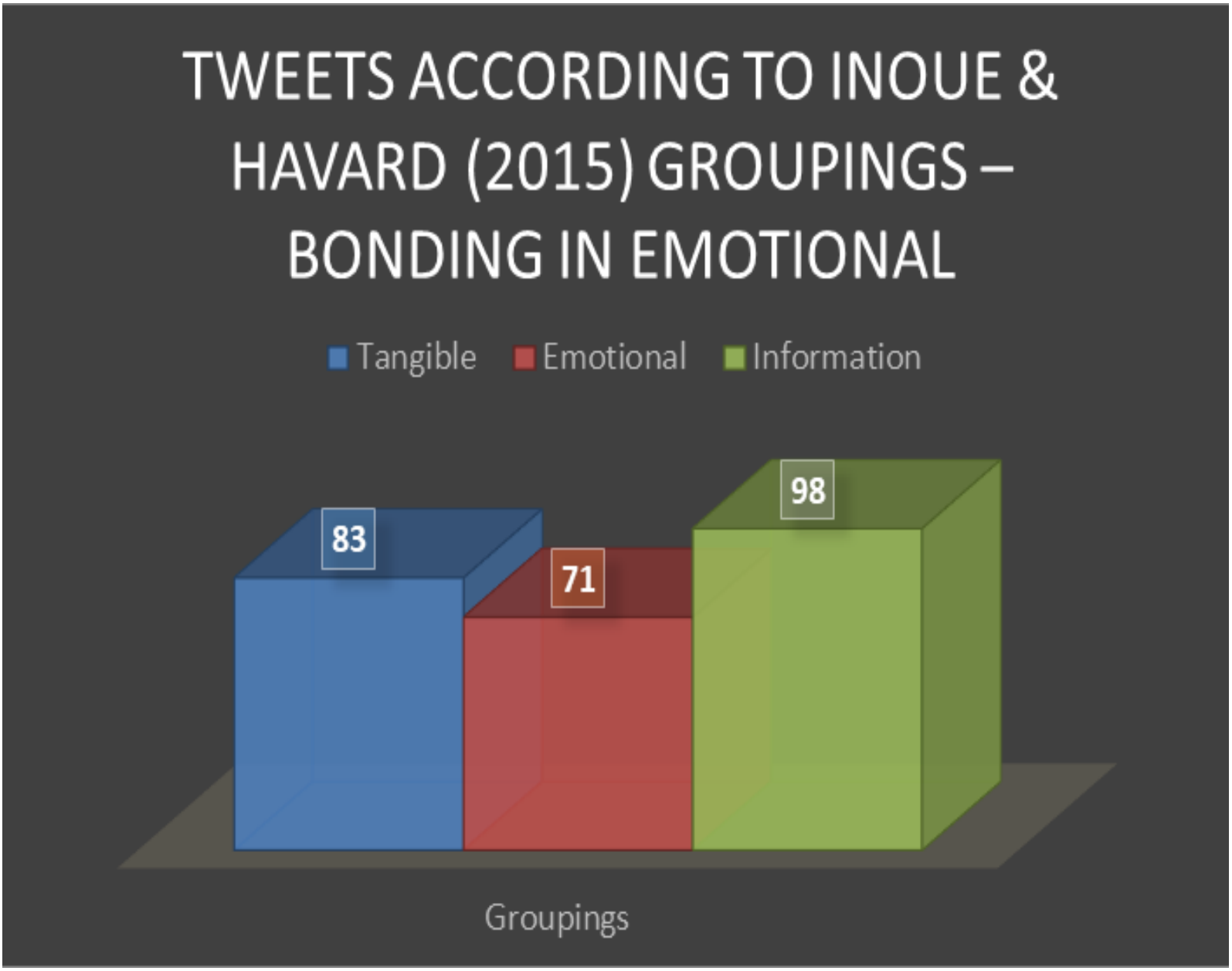
20
149
Groupings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Emotional
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Groupings