Research article

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Discovering fake news embedded in the opposing hashtag activism networks on Twitter: #Gunreformnow vs. #NRA

Abstract: After Russia's malicious attempts to influence the 2016 presidential election were revealed, "fake news" gained notoriety and became a popular term in political discourses and related research areas. Empirical research about fake news in diverse settings is in the beginning phase while research has revealed limitedly that "what we know about fake news so far is predominantly based on anecdotal evidence." The purpose of this study is to investigate fake news included in politically opposing hashtag activism, #Gunreformnow and #NRA (The National Rifle Association). This study attempted to lay out the process of identifying fake news in the hashtag activism network on Twitter as a two-step process: 1) hashtag frequency analysis, top word-pair analysis, and social network analysis and 2) qualitative content analysis. This study discovered several frames through a qualitative approach. One of the prominent fake news frames was intentionally misleading information that attacks the opposing political party and its advocators. The disinformation tweets overall presented far-right wing ideologies and included multiple hashtags and a YouTube video to promote and distribute their agendas while calling for coalition of far-right wing supporters. However, the fake news tweets often failed to provide a reliable source to back up credibility of the content.

Keywords: fake news, disinformation, framing theory, hashtag activism, social media

1 Introduction

Social media has aided in nurturing democratic communication regarding social and political events, such as the Arab Spring, Occupy Wall Street movements, and Black Lives movement (Bennett, 2003; Benkler, 2006; Farrell & Drezner, 2008; O'Connor, Balasubramanyan, Routledge, & Smith, 2010) and helped the public to participate in policy and political discourses (Bessi & Ferrara, 2016). Major social media platforms, such as Facebook and Twitter, played a significant role in conjointly framing the public's agenda. However, social media platforms were also used as vehicles for manipulating public opinions (Bessi & Ferrara, 2016). For example, during the 2016 U.S. presidential election campaign, populistic political news, made-up content, and deceptive stories had been disseminated by Russian agents associated with Internet Research Agency, via social media, including Facebook and Twitter (Badawy, Ferrara, & Lerman, 2018, August). After Russia's malicious attempts to influence the election were revealed, "fake news" gained notoriety and became a popular term in political discourses and related research areas (Badawy et al., 2018).

    Wikipedia defines fake news as "a type of yellow journalism or propaganda that consists of deliberate misinformation or hoaxes spread via traditional print and broadcast news media or online social

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media" (https://en.wikipedia.org/wiki/Fake_news). The Web 2.0 technology enabled interactive environments on the Internet, which resulted in the distribution of user-generated content worldwide in real-time (Arguete, 2017). Especially, social media has been used by people whose agendas might not usually be covered by the traditional news media while "bypassing the hierarchical and elite-controlled traditional news media" (Bowman & Willis, 2003; Chafee & Metzger, 2001). Twitter allows the sharing of ideas through "tweets," which originally had been restricted to 140 characters, but expanded to 280 characters in length in November 2017. Twitter became one of the most popular social media platforms having 330 million active users worldwide in 2019 (Twitter.com). On Twitter, users create hashtags to organize and distribute information, feelings, or opinions about news and events. Hashtags are represented with the # symbol and ultimately used to draw attention to topics. The hashtag is a community-driven practice of attaching the # to a tweet, promoting folksonomy, that can then be interpreted as metadata (Chong, 2016; Wang et al., 2011 October).

Furthermore, social media outlets have been virtual platforms for activism. Yang (2016) described the emergence of hashtag activism as a major advancement in digital activism and defined this innovative form of activism as "discursive protest on social media united through a hashtagged word, phrase or sentence" (p. 13). For example, the #BlackLivesMatter movement started in July 2013 to protest the acquittal of George Zimmerman, who shot and killed African-American teen Trayvon Martin. #Ferguson was created in response to the death of Michael Brown, an unarmed teen shot by a police officer in Ferguson, Missouri. Before a week passed after Michael's death, millions of Twitter users shared the hashtag #Ferguson (Bonila & Rosa, 2015).

The March For Our Lives movement started shortly after the Marjory Stoneman Douglas (MSD) High School mass shooting in Parkland, Florida on February 14, 2018. This is a protest movement that occurred both in the streets and online in response to the mass shooting event. The mass shooting was the deadliest school shooting in the U.S. history, but it was preceded just a few months prior by (Kerr, 2018):

–   The Las Vegas, Nevada, mass shooting, October 2017, which caused 58 deaths and injured 841 people from gun shots and the consequences of the chaos ("Gun Violence Archive," 2017)
–   The Sutherland Springs, Texas, mass shooting, November 2017, which caused 26 deaths and injured 20 people ("Gun Violence Archive," 2018)

The MarchForOurLives movement on social media using hashtags, including #MarchforOurLives, #Neveragain, and #enoughisenough, has renewed attention to the power of online activism while creating public conversations about mass shootings, school shootings, gun violence, and gun control. Proponents and opponents of gun control policy have demonstrated conflicting stance about the issue. Proponents of gun control policy strongly demanded raising the age limitation and more restrictions and systematic background checks for eligibility of gun ownership to prevent human casualties from gun violence. However, the opponents of gun control policy insisted that restricting access to firearms will not prevent gun violence and guns should be provided to good people. These opponents generally use the Second Amendment as supporting rationale and claimed gun ownership is granted by God. Accordingly, the National Rifle Association immediately filed a federal lawsuit against Florida, claiming the age-minimum section of the law violates the Second and Fourteenth Amendments of the U.S. Constitution (Yan, 2018, March 10) after Governor Rick Scott signed a bill that raised the minimum age for buying rifles in Florida from 18 to 21 on March 9, 2018 (The Florida Senate, 2018, March 9).

Scholars on hashtag activism have deeply examined the networked and connective characteristics caused by social media and Web 2.0 technology (Bennett & Segerberg, 2012) and investigated questions about activism organizations and protest organizers applying social network analysis (Gerbaudo, 2018). In addition, researchers often explored socio-political aspects of the digital or hashtag activism. However, no studies have examined fake news or disinformation interwoven in the hashtag activism networks on Twitter. Considering the prevalent evidence of fake news and spreadability online (Badawy et al., 2018; Jankowski, 2018; Silverman, 2016; Vargo, Guo, & Amazeen, 2018), this study argues that the hashtag activism networks on Twitter are not free from fake news, and empirical research needs to be performed to discover fake news diffused through social media, including trendy and popular hashtags.

While the early fruits of the first studies about fake news are appearing, some studies are interchangeably using disinformation or misinformation to interpret fake news (Badawy et al., 2018; Lazer et al., 2018). Previous fake news research studies attempted to detect fake news deployed as social media bots or trolls on Twitter using computational algorithms, although identifying players behind fake news dissemination is often impossible (Badawy et al., 2018; Bessi & Ferrara, 2016; Bulut & Yörük, 2017; Howard, Kollanyi, & Woolley, 2016; Shu, Sliva, Wang, Tang, & Liu, 2017). A number of studies about fake news focused on the 2016 U.S. presidential election case (Badawy et al., 2018; Bakir & McStay, 2018; Bessi & Ferrara, 2016; Jankowski, 2018; Mihailidis & Viotty, 2017; Vargo, Guo, & Amazeen, 2018). Empirical research about fake news in diverse settings is in the beginning phase while research has revealed limitedly that "what we know about fake news so far is predominantly based on anecdotal evidence" (Jankowski, 2018; Vargo et al., 2018, p. 2029).

Therefore, the purpose of this study is to investigate fake news included with popular activism hashtags. To achieve this goal, this study employed unique and targeted samples of data collected from Twitter, which are politically opposing hashtag activism networks, #Gunreformnow and #NRA (The National Rifle Association). This study explored the two networks in the context of political hashtag activism networks, and the following two research questions were examined:

- RQ1: What are the characteristics of the #Gunreformnow and #NRA Twitter networks, and what, if, anything can be said about those characteristics relationship to disinformation?
- RQ2: How is disinformation framed in the #Gunreformnow and #NRA Twitter networks?

While answering the two research questions, this study attempted to delineate the process of identifying frames of fake news embedded in the hashtag activism networks on Twitter. To attain this goal, this study incorporates framing theory (Entman, 1993) and social network analysis. The remainder of this paper is structured as follows: the literature review section, which defines fake news and how framing theory from communication research can be incorporated with this study, followed by the methods section, and the findings. The paper concludes with an overview, answers to the research questions, and limitations and ideas for future research.

2 Literature Review

2.1 Definitions of disinformation or fake news

In defining the idea of disinformation, Luciano Floridi (1996) asserted that "disinformation arises whenever the process of information is defective" (p. 509). This description was too general and has a flaw because accidental and honest mistakes should have been excluded from the term "disinformation" (Fallis, 2015). This flaw was remedied in 2005 when Floridi identified disinformation as "when *semantic content* is *false*, this is a case of *misinformation* (Fox, 1983). And if the source of misinformation is aware of its nature, one may speak of *disinformation*" (§3.2.3). This means that incorrect information is disinformation if the source is cognizant of its falsehood. This definition is also too extensive because, for example, if someone shares a joke or makes sarcastic comments, one knows that it is untruthful, but not disinformation (Fallis, 2015). Because even though jokes and sarcasm are fraudulent, they are neither misguiding nor intentionally misleading.

Fetzer (2004) claimed that disinformation "should be viewed more or less on a par with acts of lying. Indeed, the parallel with lying appears to be fairly precise" (p. 231), meaning that the source of disinformation is aware of its falseness and intends to mislead. In Floridi's (2011) recent argument of the notion of disinformation, he asserted that "misinformation is 'well-formed and meaningful data (i.e. semantic content) that is false.' 'Disinformation' is simply misinformation purposefully conveyed to mislead the receiver into believing that it is information" (p. 260). This implies that disinformation is false information where the originator has an intention to misguide the recipient, which is very similar with the several dictionary definitions of disinformation. For example, the Oxford English Dictionary describes

disinformation as "the dissemination of deliberately false information." This explanation requires that falseness of disinformation while excluding accidental truth and include visual disinformation (Floridi, 2011). However, this definition is also too broad. Even though the source creates incorrect information, the source might not be successful in spreading disinformation. Additionally, even though disinformation is misinforming all the time, the intention of the disinformation might not be misleading. Therefore, Floridi's (2011) definition excludes this kind of false information from disinformation.

Fallis (2009) claimed that disinformation is "misleading information that is intended to be (or at least foreseen to be) misleading" (§5). This definition clarifies the shortcomings of Floridi's (2011) description because Fallis (2009) clearly specified that disinformation is misguiding while excluding unintentional and harmless lies. For instance, incorrect information has been added into Wikipedia by researchers to discover how long it takes the public to make corrections (Halavais, 2004). Lastly, Fallis (2009) argued that disinformation does not have to be intentionally misleading; the source of the information simply has to predict the likeliness of misguidedness. His analysis can easily be modified, but it does not categorize satire as disinformation. If the "foreseen to be misleading" part is omitted and modified as "disinformation is misleading information that is intended to be misleading" (pp. 400-411), this revised definition looks upon the side effects of disinformation, such as the previous Wikipedia example. In this case, researchers do not want to mislead people with the false information in the website, but they do foresee that the readers of the website might be misguided by the incorrect information on the website.

2.2 Three features of disinformation or fake news

What are the objectives of fake news? Chisholm and Feehan (1977) articulated four goals of deception in "The Intent to Deceive," and they are generating a new fictitious belief, managing a current fictitious faith, damaging a genuine belief, and prohibiting the attainment of true belief (as cited in Fallis, 2014, p. 140). Fallis (2014) also introduced a helpful categorization of the objectives of deception, which are misleading about "the accuracy of the content; the source believing the content; the identity of the source; and an implication of the content being accurate" (p. 142). Fallis (2015) identified three important characteristics of disinformation. First, disinformation is a kind of information. This feature can be arguable depending on the definition of information. In this study, information is defined as something that has a representational element (Floridi, 2011; Scarantino & Piccinini, 2010), and this study used the term information to refer to what Buckland (1991) calls "representations" (p. 359). In this study, the concept "information" indicates representational structure that is both fictitious and true (Fallis, 2015, p. 406).

The next main aspect of disinformation is that disinformation is misleading information, which tends to generate fictitious beliefs. This feature makes disinformation harmful and thus, creates our concern. The agenda behind disinformation does not have to be achieved to be disinformation because even though the recipients did not buy the disinformation, it still has the tendency to mislead. Therefore, disinformation constantly puts people in danger of suffering mental instability. The third facet of disinformation is that it is intentionally misleading information, which differs from more inoffensive modes of misguiding information, including candid mistakes and excessively sophisticated satire (Fallis, 2015). This aspect also helps us to detect these particular kinds of misguiding information.

2.3 Framing theory

Although framing theory is one of the most popular media communication theories cited more than 6000 times in scholarly articles, most of the studies applied the theory in journalistic contexts by examining news media content. However, approximately 68% of the U.S. public obtains news on social media, though almost 60% of those social media news consumers think that the news they get on social media is largely inaccurate (Matsa & Shearer, 2018, September 21). While the traditional new media was struggling with the technological advances, major social media outlets have been central platforms and information hubs

of political communication for the past decade. Framing theory has traditionally been used for traditional news media contend, but the rise of political communication on social media justifies the use of framing theory for Twitter content. Thus, this study extended framing theory to analyze social media content because of the drastic change of the media environment and social media consumption.

Entman (1993) wrote, "Framing essentially involves selection and salience. To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, casual interpretation, moral evaluation, and or treatment recommendation for the item described" (p. 52). Framing also highlights a certain side of reality while hiding other aspects. In other words, the idea of framing constitutes academic comprehension of specifically how communication promotes certain translations of reality through the interconnection of people's current schemas and freshly interacted information (Entman & Usher, 2018). Entman (1993) further clarified the theory that media content generates frames by adding or eliminating certain "key words, stock phrases, stereotyped images, sources of information, and sentences that provide thematically reinforcing clusters of facts or judgments" (p. 52).

Political psychologists who contributed to the framing research claimed that framing is about creating value and interplay between the approaching message structure and intellectual features of the receiver (Reese, 2010). Frames conform to set up hierarchies between values (Nelson & Willey, 2001). Information can stimulate psychological schemas, and the responses to the stimulation differ depending on the recipients' prioritized value (Reese, 2010). Frames express and deal with courses of reasoning regarding public matters and topics in public discourses, and are created within their "cultural rootedness," which is a significant facet of frames (Reese, 2010, p. 22). Friedland and Zhong (1996) encapsulated those concepts that frames work for "the bridge between . . . larger social and cultural realms and everyday understandings of social interaction" (p. 13). Therefore, how social agents take part in generating and managing certain frames, the circulation structure of the digressive circumstances, and the contributing interests have to be examined by considering the socio-political foundation of the society.

Framing analysis sees texts as a composition of systematized emblematic instruments that communicate to individuals' memory to build meaning (Zhong & Kosicki, 1993). In addition, framing analysis examines the structural formation of text and the diverse perception of media content that enables empirical shortcuts in media content creation and digestion (Van Dijk, 1988). Further, framing analysis keeps the organized steps of collecting information from media content to identify important components that are probably consumed by individuals. Framing analysis does not accept the idea that frames in media content can solely exist without considering audiences of the texts (Zhong &Kosicki, 1993). Framing analysis is an applicable method to this study because, as previously defined, fake news is intentionally misleading information, which challenges or reinforces individuals' perceptions of certain realities or schemas placing agenda behind the information.

3 Methods

3.1 Data collection

With the help of Web 2.0 technologies, social media websites allow users platforms that facilitate user-generated content while providing user-centered platforms with real-time updates and global access (Chong & Chang, 2018).

Milan and Hintz (2013) indicated that activism supported by technology reconstructed the way people participate in organizing socio-political life. Researchers defined digital activism as "an organized public effort, making collective claim(s) on a target authority(s), in which civic initiators or supporters use digital media" (Ghobadi & Clegg, 2015; Vegh, 2003). Through the power of digital activism, #MarchforOurLives was able to sustain a large scale social impact. The hashtag #MarchforOurLives was created by the student leaders of Marjory Stoneman Douglas High School in response to the mass shooting on March 18, 2018 (Scanlan, 2018, February 18). One of the main agendas of #MarchforOurLives is calling for gun violence

prevention policies, and this study used targeted and unique samples that employed the pro-gun #NRA and anti-gun #Gunreformnow in order to examine fake news in the hashtag activism networks. Tweets were collected by applying #NRA and #Gunreformnow through the Twitter application programming interface (API) on February 22, 2018 and on February 27, 2018, respectively. A total of 2,371 vertices generated 3,720 edges, such as tweets, retweets, mentions, and replies, which are relationships between vertices, in the #Gunreformnow network. The activism hashtags #Gunreformnow and #NRA were selected because they respectively represent those who support and those who oppose restrictive gun control.

3.2 Data analysis

Multiple approaches were applied to answer the two research questions. The two collected data sets were investigated to discover the answers to the two research questions: 1) To examine the characteristics of the #Gunreformnow and #NRA networks in perspective of disinformation and 2) To identify frames of disinformation included in the hashtag activism networks comparing the politically opposing networks. This study attempted to outline a process for identifying fake news embedded in hashtag activism on Twitter. The process was comprised of two steps drawing from two different methods. First, the characteristics of the two politically opposing hashtag networks were investigated through hashtag frequency analysis, top word-pair analysis, and social network analysis. Second, the frames of the disinformation included in the hashtag networks, in this case fake news embedded in two opposing hashtag activism network, were qualitatively examined using content analysis method.

This study employed NodeXL to conduct social network analysis. NodeXL is an add-in Excel analytics software specialized in social media analysis by importing data from the popular social media websites, including Facebook, Twitter, YouTube, and Wikis (Hansen, Shneiderman, & Smith, 2010). To discover characteristics of the #Gunreformnow and #NRA networks, top word pair and hashtag frequency analysis were performed via NodeXL. The collected data was curated by a combination of network clustering algorithms and investigated by applying social network analysis. Visual network diagrams of collections of actors (a vertex, vertices) were created, and the network impact (e.g., betweenness centrality or page rank) of a single actor on others was estimated in the entire network on the #Gunreformnow and #NRA networks. For each hashtag, fifteen major clusters were identified and several iterations were conducted to condense sub-groups. To closely examine the influencers of the two networks, the top ten Twitter accounts of the high betweenness centralities were manually examined.

Social connectivity of a user can be gauged by betweenness centrality, which determines the number of relationships a user retains, such as degree centrality. Betweenness centrality represents a user's calculated position in reaching everyone else in the network, and more specifically, calculates the rate of occurrence at which a user locates the shortest path linking all others in the network (Freeman, Roeder, & Mulholland, 1979). The idea of betweenness centrality is closely related to the strength of weak ties. Kadishin says, "Weak ties as a concept describes the nature of a relationship between nodes in terms of the consequences for an entire network" (Kadishin, 2004, p. 29). Therefore, vertices presenting both high betweenness centrality and high degree centrality are the most powerful and influential users in the entire network. Important vertices in an individual topical network can be discovered applying these betweenness and degree methods.

Scholars view content analysis as an adaptable method that is one among many to examine text data (Hsieh, & Shannon, 2005). Qualitative textual analysis is frequently applied to investigate hidden or implied representations of the communication on research, and this process can lead to the improvement of models or theories depending on the scholars' expertise and findings extracted from the study (Berg, Lune, & Lune, 2004). The scholars can conduct manual examinations of the text units or data if the size of the data is small enough for research on a specific topic and allows for the discovery of meaningful patterns for producing descriptive information (Kondracki et al., 2002). Studies employing qualitative content analysis emphasize the linguistic features as communication with a focus on the contextual meaning of the content (Budd, Thorp, & Donohew, 1967; Lindkvist, 1981; McTavish & Pirro, 1990).

4 Findings

4.1 Hashtag frequency analysis, top word-pair analysis, and social network analysis of the #Gunreformnow vs. #NRA Twitter networks

The two hashtags, #Gunreformnow and #NRA, have been more frequently used whenever mass shootings occurred in the U.S. A few days after the MSD High School shooting, twenty surviving students from the mass shooting, including several key members, founded "Never Again MSD" out of resentment and frustration towards the inertia of the Republican-controlled Senate, House of Representatives, and the Florida state government. These survivors of the shooting demanded lawmakers take action on gun violence (Scanlan, 2018, February 18). The Never Again MSD student leaders, including Jaclyn Cory, Cameron Kasky, Alex Wind, Emma González, and David Hogg, organized the March For Our Lives movement and a significant part of its mission statement is preventing gun violence. The March for Our Lives website says "Stop NRA. Register to vote" (https://marchforourlives.com); thus, tweets with #Gunreformnow and #NRA supported politically opposite ideology as in pro-gun control versus anti-gun control.

Table 1. Top hashtags in the #Gunreformnow and #NRA networks

top hashtags in tweets in the entire #Gunreformnow graph	Count	top hashtags in tweets in the entire #NRA graph	Count
gunreformnow	2145	nra	3793
neveragain	427	2a	388
guncontrolnow	291	parkland	317
boycottnra	212	maga	218
banassaultweapons	168	guncontrol	191
marchforourlives	148	waynelapierre	179
guncontrol	142	neveragain	177
gunfreezoneskill	101	nrabloodmoney	166
nra	99	trump	159
parkland	82	cpac	158

Table 1 presents the most used hashtags in the two networks. In the #Gunreformnow network, similar hashtags, such as #guncontrolnow, #banassultweapons, and #guncontrol, appeared many times, which means many tweet relationships of the network supported the gun reform agenda. The hashtags, #neveragain, #marchforourlives, and #parkland, were also frequently applied in the #Gunreformnow Twitter network because #parkland signifies the Stoneman Douglas mass shooting and #Neveragain and #MarchForOurLives were created for the gun violence prevention movement, which corresponds to the use of #gunreformnow. Top ten popular hashtags in the #Gunreformnow network either purposefully coincided with the use of the #gunreformnow hashtag or represented the motivational event of the hashtag. In a nut shell, the #Gunreformnow Twitter network clearly represents the activism network based on the frequently shared hashtags.

In the case of the #NRA network, conservative slogans, such as #2a (the second amendment), #maga (Make AmericaGreatAgain), and public figures, such as #trump, and #WayneLapierre (the executive vice president of the NRA in 2018), were repeatedly employed. The commonly shared hashtags for both networks are #nra, #parkland, #guncontrol, and #neveragain. This demonstrates that the two networks are closely related and deal with shared interests while representing their agenda as shown with the most popularly shared hashtag, #gunreformnow and #nra, for each network. Comparing top word pairs can provide further insights about the characteristics of the two networks.

Table 2. Top word pairs in the #Gunreformnow and #NRA networks

Word 1	Word 2	Count	Salience	Word 1	Word 2	Count	Salience
nothing	cowardly	215	0.008	nra	members	244	0.005
cowardly	nra	215	0.008	speak	out	213	0.007
nra	puppet	215	0.008	5	million	193	0.005
puppet	marcorubio	215	0.008	wayne	lapierre	191	0.005
marcorubio	anything	215	0.008	million	nra	186	0.005
anything	involving	215	0.008	dana	loesch	162	0.004
involving	gunreformnow	215	0.008	parkland	nra	160	0.004
gunreformnow	taken	215	0.008	2a	nra	153	0.004
amandionair	nothing	214	0.008	town	hall	138	0.004
taken	serious	214	0.008	cnn	town	121	0.003
gunreformnow	neveragain	120	0.006	1	5	116	0.003
ar	15	113	0.005	5	population	116	0.003
gunreformnow	guncontrolnow	112	0.005	members	323	114	0.003
neveragain	gunreformnow	102	0.005	323	million	114	0.003
guncontrolnow	gunreformnow	101	0.005	million	americans	114	0.003

Table 2 demonstrates top word pairs for both networks. In the #Gunreformnow network, many tweets condemned the Republican Senator of Florida Marco Rubio because of his responses of not taking proper action to prevent gun violence. The participants of the network called the Senator an "NRA puppet" because he received an "A+" grade and more than $3.3 million from the NRA (Korte, 2013). Top word pairs of the two networks illustrate that the #Gunreformnow network is focused on its activism agenda, which is promoting gun control policies, criticizing responsible politicians, indicating AR-15 semiautomatic rifles that were used for multiple mass shooting events in the U.S. (Grinberg, 2018, February 22).

A CNN town hall meeting was held on February 22, 2018, shortly before this data was collected. Dana Loesch, spokesperson of the NRA and a former writer and editor of Breitbart, attended the meeting where she strongly supported her organization (Grinberg, 2018, February 22). The participants of this network repeatedly mentioned the U.S. population, 323 million, while implying they are representing the entire U.S. society. When compared to the #Gunreformnow network, the #NRA network calls attention to the CNN town hall meeting and encourages people to speak out for the members. Wayne La Pierre announced that the number of NRA members exceeded 5 million as of May 2013 (Korte, 2013), and the #NRA network demonstrated a call for unity of the NRA members. In addition, among the shared hashtags for both networks, #nra, #parkland, #guncontrol, and #neveragain, only nra appeared commonly. However, the semantic use of "nra" demonstrates a gap between the two networks. For example, nra was employed to attack the organization and the NRA advocating politicians in the #Gunreformnow network. On the contrary, nra was combined to justify the organization's ideology (2a nra) and call for ties among the NRA members as hinted in Table 2.

Figure 1 presents the top 15 groups of the #Gunreformnow network displaying top key words. The highlighted red is the NRA vertex, @NRA. Figure 1 and Figure 2 below were created by applying Clauset-Newman-Moore algorithm. This algorithm defines the main clusters in a network by placing vertices into the best fitting cluster depending on the patterns of interconnectedness. This clustering method generally forms a few dominant groups and several very small ones. (Wakita & Tsurumi, 2007). In this network, @NRA strongly connects the top clusters, but this network mentioned nra to castigate the organization and its agenda as identified by the previous top word pair analysis. This is also supported by the top key words featured in the according cluster as shown in Figure 1 and further backed by examination through qualitative content analysis next. Figure 2 illustrates the top 15 groups of the #NRA network with top key

words, and the red lines indicate the relationships between @NRA and other vertices. When compared to the one in Figure 1, @NRA is the most dominant player in this network and leads the agenda of the entire network.
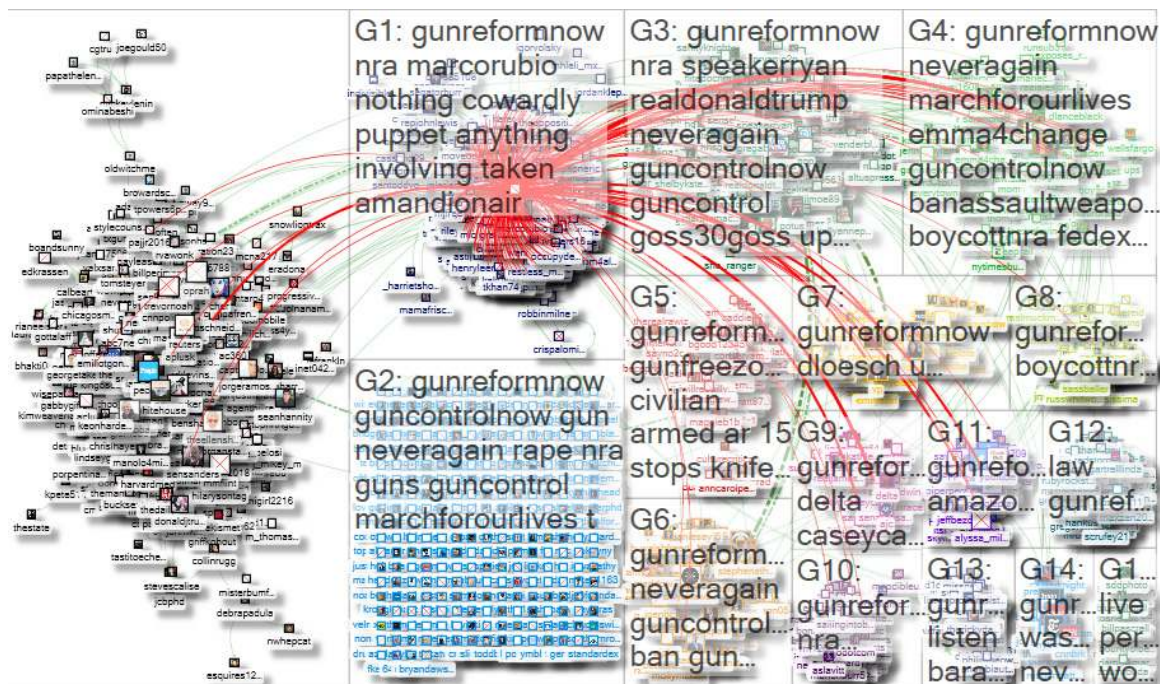

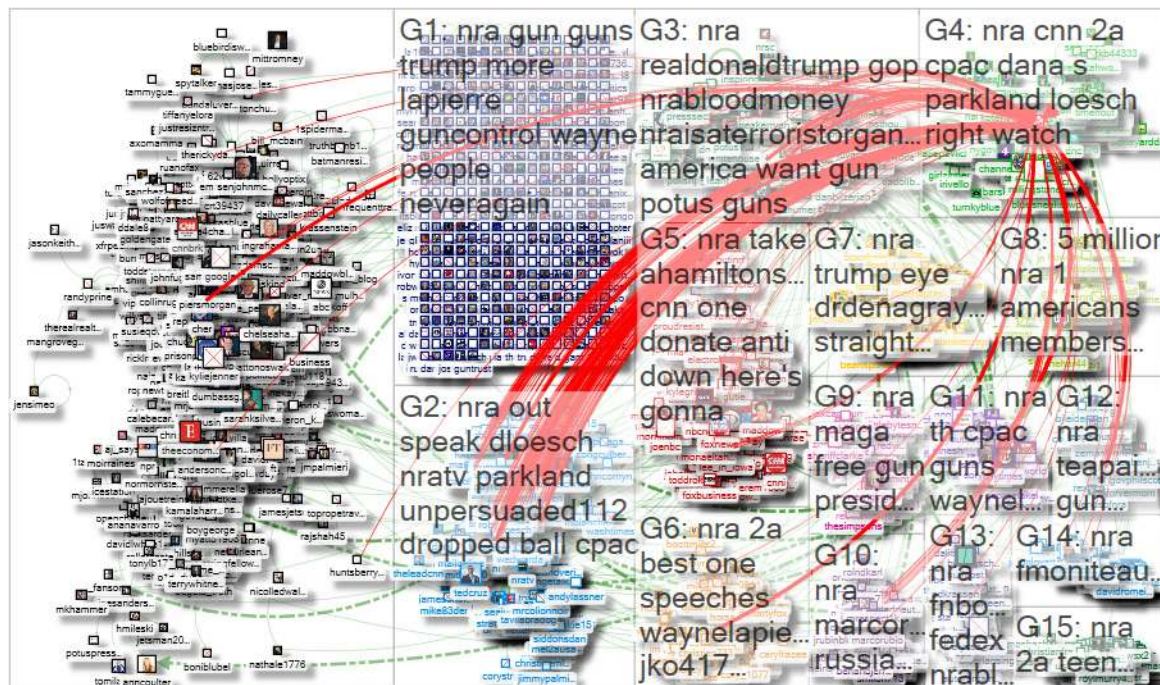**Figure 1.** The top 15 groups of the #Gunreformnow network on Twitter with top key words

Figure 2. The top 15 groups of the #NRA network on Twitter with top key words

The influence of the NRA in both networks is additionally supported by the following betweenness centrality measure. Betweenness centrality implies that a vertex with high betweenness centrality connects the major groups, otherwise they are fragmented or incoherent, and it also indicates the elevated level of influence and connectivity (Freeman, 1979).

Table 3. Top 10 Vertices, ranked by Betweenness Centrality in the #Gunreformnow and #NRA networks

Top 10 Vertices, Ranked by Betweenness Centrality in the #Gunreformnow network	Betweenness Centrality	Top 10 Vertices, Ranked by Betweenness Centrality in the #NRA network	Betweenness Centrality
nra	**1419417.247**	**nra**	**2308907.916**
davidhogg111	623865.1162	realdonaldtrump	2017137.787
thegoldwaterus	458347	dloesch	1136524.364
culturecriticz	451828	emilieullerup	750640.45
debrammason1	440856	nratv	664558.9142
speakerryan	325053.8233	cnn	639345.36
bobinhb	303539.1563	professorrobo	570380.8651
realdonaldtrump	245279.3957	amerikangirlbot	535429.8221
miamipapers	229927.0972	jko417	465121.3497
emma4change	221540.0191	marcorubio	447078.4602

Some vertices have high betweenness centralities, which implies that they are closely connected with the major groups in the network (Hansen et al., 2011). In Table 3, the NRA had the highest betweenness centrality, which implies that @NRA is the key agent connecting other groups and vertices of both networks. This makes sense because this activism is about gun violence problems in the U.S., and the NRA is the most powerful interest group that sets agendas for gun owners as well as the gun industry regarding gun policies in the U.S. society. David Hogg and Emma Gonzalez, two of the surviving students from the shooting and key organizers of the March For Our Lives movement, and Donald Trump, Dana Loesch, and Marco Rubio are the key players in connecting participants to the networks respectively. Overall, the results from top hashtag analysis, top word pair analysis, network visualization, and betweenness centrality analysis have providing coherent findings. Interestingly, as shown in Table 3, Twitter user @thegoldwaterus, representing the far-right conspiracy online media, thegoldwater.com, also presented high betweenness centrality as 458347. The Twitter user, @thegoldwaterus, was further qualitatively examined through the framing analysis of Twitter content, including texts, hyperlinks, videos, and images, in the following section.

4.2 Framing analysis of the #Gunreformnow vs. #NRA Twitter networks

One of the prominent instances of framing of the fake news included in the dataset was misleading information that the ultimate goal of the gun violence prevention movement is gun confiscation orchestrated by the left while advocating the NRA's justification of gun ownership. The political inclinations of the identified disinformation in this framing are majorly right wing or far- right wing. For example, "#ParklandSchoolShooting #ShallNotBeInfringed #JoinTheNRA #2A #gunsdontkillpeople #CNNFakeNews #GunReformNow #GunControlNow Great video showing that gun confiscation IS in fact the goal of the left. https://www.youtube.com/watch?v=HXOw0n

E6vIM&t=328s." The Oxford dictionary defines the word "confiscation" as "the action of taking or seizing someone's property with authority" (oxforddictionaries.com). Thus, this tweet implies that the gun issue is about securing property from the government not about protecting peoples' lives from gun violence. "IS" is grammatically used as a be-verb here. The content of this tweet is not based on any intellectual or legitimate source, and the content is currently unavailable and YouTube, the website source of this disinformation, indicates that "This video is no longer available because the YouTube account associated with this video

has been terminated." According to YouTube's community guidelines, if an account receives three strikes in three months, the account is terminated (Murphy, 2018, February 24). YouTube explains its termination policy as "If your channel is terminated, you may be prohibited from accessing, possessing, or creating any other YouTube channels" ("Channel terminations - YouTube Help" n.d.). Based on this description, the YouTube video was most likely terminated by YouTube because the content violated the company's regulations.

One of the conspiracy theories regarding Sandy Hook Elementary School mass shooting is that it was a hoax orchestrated by the U.S. government and gun-control activists and played by crisis actors and a completely fake event (https://www.cnbc.com/2018/09/14/alex-jones-5-most-disturbing-ridiculous-conspiracy-theories.html). Alex Jones is an American radio show host of *The Alex Jones Show* and an owner of a far-right wing website infowars.com that promotes conspiracy theories and fake news (Dicker, 2016). He has been sued by several families of Sandy Hook victims and FBI agents for defamation. The popular social media platforms, including Facebook, Apple, YouTube and Twitter, completely suspended infowars.com and his personal account (Liao, 2018, September 06; Riotta, 2019, May 02). Alex Jones also claimed that the Stoneman Douglas shooting survivor David Hogg is a crisis actor, and the mass shooting event was organized by gun control advocates (Dicker, 2016; Murphy, 2018, February 24).

Another example of this framing includes a tweet by @thegoldwaterus, a far-right wing news website. For example, @thegoldwaterus posted a tweet "Civilian Armed with an AR-15 Stops Knife Wielding Criminal From Killing his Neighbor #GunFreeZonesKill #GunReformNow #ArmingTeachers #2A #2ADefenders #2ndAmendment #SecondAmendment #NRA #SupportTheNRA." The @thegoldwaterus identified *Fox5*, a local news channel, as a single source of the information and uses the anecdotal incident to support the NRA. Many news stories posted on the website are propaganda and significantly unreliable. For example, a news story titled as, "Hundreds of Christians Massacred in Days: Islam Is a Cancerous Plague" was published on July 8, 2018 in thegoldwater.com. On April 20, 2019, the byline of this story is indicated as Red Pill who introduces himself as "This is a redpill on the media and big tech all unto itself, and the globalists who control them" in the story (Pill, 2018, July 08). However, the byline of the story was Tubbs C. when the story was first examined in August 2018 for the study. However, thegoldwater.com does not provide any explanations about the change. This story used an appalling image showing a group of dead bodies from a different news website published in 2010 without providing its relevance to the story. The single source of this news story is *Breitbart*, a far-right and conspiracy news website, and the story says, "Thank you to Breitbart for having the bravery to cover this as well, and thank you to the few actual journalists who have no fear of Islam" (Pill, 2018, July 08). Red Pill claimed "Please wake up. This is what will happen in America if Democrats ever regain control of the House, Senate, and the Oval Office" Pill (2018, July 08). The tone and content of this article are extremely sensational and biased using horrific photos of genocide of black people. For example, Pill (2018, July 08) stated "Islam Is A Death Cult," and the following comments regarding this article were "Islam is a death cult for sure," "There's nothing I can't stand more than the fact that the left loves these terrorists," "Kill them all," and "niggers killing niggers in niggerland, who fucking cares." As described above, the posted news story substantially lacks traditional and ethical journalism practices. However, it requires attention because @thegoldwaterus played a significant role by bridging the gap in the #Gunreformnow network presenting high betweenness centrality next to the NRA and David Hogg in Table 3. This implicates that a far-right fake news website may have affected the progressive activism network on popular social media.

Figure 3. A tweet by Sean Hannity

Another framing characteristic of fake news, especially in the #Gunreformnow network, was disrespecting or attacking the political leaders of opposing party. For example, Figure 3 presents a tweet by @seanhannity "pedal to the metal #ObamaGate #ObamaKnew #GunReformNow #TuesdayThoughts #QAnon https://t.co/GASCYYjxFc." This is posted by Sean Hannity, a conservative political commentator and the host of *Hannity* on *Fox News*.

Although the content of the tweet is irrelevant to gun policy issues, the tweet is disseminated Figure 3. A tweet by Sean Hannity with the #Gunreformnow, and the objective of this tweet is to intentionally defame Barack

Obama based on an article published in a conservative magazine, *The Washington Examiner*. In addition, *The New Times* described QAnon as "an interactive conspiracy community" by pro-Trump groups (Bank, Stack, & Victor, 2018, August 01). Along with the image of this tweet, the included hashtags, #ObamaGate and #ObamaKnew, intentionally mislead the audience without providing supporting evidence. In Figure 5 below, @BanksyArtist listed David Hogg along with the well-known historic dictators, such as Hitler and Stalin, including #NRA, #qanon, and #MAGA. This tweet intends to insult Mr. Hogg, and in response to this tweet, @___Shultz___ is questioning the mental condition of @BanksyArtist, including #GunReformNow, #NeverAgain, and #ShameOnYou in the tweet.

In the network of #NRA, not much disinformation was discovered when compared to the #Gunreformnow network. A tweet by @ChristieC733 claimed that mass shooters were leftists without supporting evidence. However, this tweet was shared and liked hundreds of times as shown in Figure 4. A tweet, "Three years ago, Wayne LaPierre told the truth about background checks. And the anti-gun media buried it. Don't let them do it again. Please share. Spread the #truth #NRA. https://m.facebook.com/story.php?story_fbid=2070882216263132&id=665345483483486" asserted that NRA supported background checks, but the speech by Mr. LaPierre was full of claims that would secure the NRA's interests. Because of the conflicting political views between #Gunreformnow and #NRA supporters, these two hashtags often appeared and were used to attack or to defend each side.
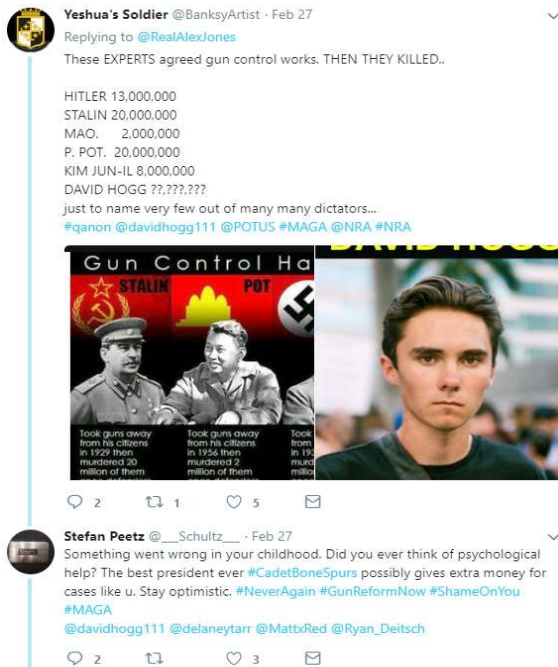
Figure 5. The tweets used by #Gunreformnow and #NRA to attack each other

Figure 4. A tweet by @ChristieC733

The NRA was often framed as a terrorist organization by the #Gunreformnow users. Advocators of gun control policy blamed the NRA for its extensive influence over both Conservative and Democratic politicians while ignoring the seriousness of gun violence problems in the U.S. society and named the NRA as "a terrorist organization." The hashtag #NRAisATerroristOrganization were examined multiple times in the #NRA network without a supporting source. This frame appeared partially because terrorist acts are considered as one of the most harmful actions in the U.S. society, especially after the 9-11 attack, which implies the #Gunreformnow participants regarded the NRA as the most malicious organization.

One of the identified frames was condemning fake news and its generators or disseminators. For instance, a tweet says, "Florida school shooting conspiracy theories have landed Alex Jones and InfoWars in hot water with YouTube https://t.co/ENqxDZvqVf #MovingForward #FakeNews #NeverAgain #GunReformNow #onemorestrikeUrOUT." This tweet demonstrates that some participants are aware of fake news in relation to the issue. Similarly, a tweet, "Another right wing conspiracy bites the dust. #GunReformNow #gunviolence https://t.co/WcV8kOMU2M" also illustrates the identical frame as the previous tweet. Another interesting frame was framing as an instance of fake news. Some participants warned others by saying "fakenewsalert" in their tweets. This implicates that some online activists are well aware of fake news disseminated in social media and do not blindly believe information on social media as true.

5 Conclusions and Discussion

This study investigated fake news while attempting to lay out the process of identifying fake news in the hashtag activism networks on Twitter. This study suggested two steps for the process: first, hashtag frequency analysis, top word-pair analysis, and social network analysis provided the characteristics of the #Gunreformnow vs. #NRA Twitter networks. Second, the qualitative content analysis examined frames of disinformation included in the tweets of the two networks. There were several frames discovered through qualitative content analysis. One of the prominent frames identified in the datasets was intentionally misleading information that attacks the opposing political party and its advocators. The examined fake news tweets generally presented far-right wing ideologies including multiple hashtags and a YouTube video to promote and distribute their agendas while calling for a coalition of far-right wing supporters. However, the fake news often failed to provide a reliable source to back up credibility of the content. Many video clips of the fake news in the datasets were permanently terminated and thus, they are no longer available for watching.

A far-right wing news website, thegoldwater.com, was identified as a source of disinformation. The Twitter account of the website, @thegoldwaterus, was recognized through Social Network Analysis as an important player with high betweenness centrality in the #Gunreformnow Twitter network, which may not be able to be discovered via qualitative content analysis. Defaming influential public figures was also observed as a way of framing fake news. These framing strategies were more frequently discovered in the #Gunreformnow network than the #NRA network. Some participants were aware of fake news embedded in the networks and warned of the distribution of fake news. Most fake news tweets were extremely biased, and their political inclinations were majorly right wing or far-right wing. Creating and disseminating fake news by the groups stood out particularly in the #Gunreformnow network. Proponents and opponents of more restrictive gun control policy adopted information or news stories about guns and gun violence differently. The majority of the #Gunreformnow participants were Democrats and progressive in terms of political stance, and the dominant participants of the #NRA network were right wing. The study further confirmed that U.S. society is bipartisan and holds an extremely opposing position regarding gun reform policy.

Regarding conflicting social issues like gun control policy, hashtag activism is similar to an information war, and the applied hashtags might be used as weapons to attack the opposing groups. This study empirically revealed a hidden fake news battle within the hashtag networks on Twitter while identifying its framing characteristics and ideological inclinations. This is the contribution of this study to the body of fake news literature because this study provided evidences that hashtag activism or online activism is under the influence of fake news that manipulates the political discourses of the participants in the networks.

On September 5, 2018, during Senate hearings, Sheryl Sandberg, COO of Facebook, and Jack Dorsey, founder and leader of Twitter, told Senators that the companies were prepared to fight against foreign intrusion on their platforms for 2018 midterm elections. Sandberg said, "We were too slow to spot this and too slow to act. That's on us" (Romm, & Timberg, 2018). Dorsey said, "Required changes won't be fast or easy" (Romm, & Timberg, 2018). The two executives expressed that they acknowledged the seriousness of disinformation distributed in their social media and would take necessary actions in the Senate hearings. However, as Mr. Dorsey mentioned, rooting out fake news would never be an easy task. For example, in the case of Alex Jones and his conspiracy theory website, infowars.com, his followers constantly disperse his theories and narratives, although most of them are deficient in evidence. Moreover, Jones' company has been very successful by selling disinformation and conspiracy theories, proving it is a profitable business model. He made more than $20 million in revenue each year based on court documents and became an example of a successful businessman as a manufacturer and disseminator of disinformation (Higgins, 2018). Despite the suspension by the major social media channels that tremendously helped his success, Alex Jones is still aggressively active by maintaining his original opinions and stances.

6 Limitations and Future studies

This study explored fake news in the hashtag activism network. Through a lens of framing theory, this study empirically identified and classified frames of fake news in the hashtag activism networks. The comparatively small size of datasets used for the study enabled a qualitative approach, but this aspect could be a limitation as well. Applying big data to examine fake news in activism Twitter networks could result in different findings, and thus, may improve the body of knowledge about fake news literature. Including this study, many fake news studies were designed in political contexts. However, fake news research needs to be extended to diverse contexts with various platforms due to the prevalence of fake news dispersed especially through social media.

A 2016 Pew research survey discovered that approximately 25% of U.S. people had shared fake news, and fake news on Facebook had been shared and liked more than real news stories during the past three months before the 2016 presidential election (Davies, 2016). In addition, average people are likely to trust fake news at least one out of five times, and fake news is disseminated six times as quickly as true stories on Twitter (Steinmetz, 2018, August 09, p. 31). Empirical studies to examine this phenomenon may help to understand why fake news is easily believed and do perform better than the real news stories in distribution. The development of technology boosted the quick and easy distribution of disinformation, and like Alex Jones' case, money-making can be a motivation for creating and diffusing fake news. The motivations of creating and sharing disinformation are also largely unknown and therefore, need to be explored in the future studies.

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