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Setting the Agenda: Competition between Citizens and News Media

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Setting the Agenda: Competition between Citizens and News Media

By

CATHERINE U HUH
DISSERTATION

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Abstract

Social media have become an essential part of day-to-day communication, adding to the spaces where citizens can gain information, participate in politics, mobilize actions, and influence over political agenda. The literature on agenda setting has long debated the direction of agenda setting dynamics, attempting to resolve the question of who influences whom. Although several studies examined inter-media agenda setting effects between social media and traditional news media, existing literature generates mixed results mainly because scholars paid little attention to the user dynamics in social media and their role as an agenda setter. In contrast with most existing research on inter-media agenda setting, the current study attempted to disentangle different Twitter users to understand how social media influence the news media agenda and how political and media elites and citizens interact in the decentralized social media sphere during a heightened political period when both journalists and citizens have access to information sources. A total of 247,600 Twitter messages on 3 different issues were examined, revealing that Twitter generally had agenda setting effects on news media. When the connectivity was considered, however, only the high-influence group by in-degree on Twitter shaped the media agenda. In other words, accounts with the most followers are likely to control the information flow between news media and Twitter. Media organizations predominantly were in the high-influence group and approximately 10% of the citizens belonged to the high-influence group. While the results demonstrated that social media play a critical role in setting the agenda, traditional media are yet highly influential within the Twitter network. The current study also found that citizens participate in the agenda setting process by producing a high volume of tweets on social

media and effectively distributing them through their networks. Citizens' efficacy is in its

aggregate effect, which enables citizens to compete with traditional media's singular

agenda setting influence. Limitations and implications of the study were discussed.

CHAPTER ONE

Introduction

Increasingly, social media are becoming an important platform for political communication. While approximately 70% of US adults use social media sites, 25% of social media users follow candidates or other political figures on various social media platforms and one-in-five politically engaged users (19%) indicate that they often comment, discuss or post about political issues with others on social media (Auxier & Anderson, 2021). In particular, social media are quickly emerging as an important outlet for news engagement in contrast to the dropping readership of traditional newspapers. Recent studies show that 70% of US adults receive news on social media. Nearly a third of US adults regularly get news from Facebook and 13% from Twitter (Auxier & Anderson, 2021). With no geographic constraint, social media create new public spheres in which people from diverse backgrounds can consume information about political issues, produce content as individuals or as a community, and participate in the diffusion of the content, changing the dominant form of political participation (Anderson, 2006; Powell, 2005; Shirky, 2008; Aday et al. 2013).

While the increasing use of the Internet has redefined political participation, social media further expanded the way citizens engage in politics. Political participation has taken into new forms through the emergence of online agoras and forums (Gil de Zúñiga et al., 2010). In contrast to traditional mass media, social media provide new or previously rare contexts for emotional expression and engagement offering low-cost opportunities for citizens to join political discussion (Gil de Zúñiga, 2009; Shah et al., 2007; Shirky, 2011). With the high level of connectivity and interactivity, social media can also be inclusive of multiple publics and connect

seemingly disparate actors in political debate (Maireder & Schwarzenegger, 2012). Papacharissi (2010) contended that internet democracy is the displacement of the public sphere model with that of a networked citizen-centered perspective providing opportunities to connect the private sphere of autonomous political identity to a multitude of chosen political spaces. In the same vein, Loader et al. (2014) argued that participation in social movements, rallies, and protests through social networks is becoming the primary cultural form of engagement potentially displacing the traditional models of representative democracy.

Traditionally, the dynamics of mass communication were driven by the power of media to select and shape the presentation of messages to influence the agenda as well as priming and framing of public issues, and thus intervene in both the formation of public opinions and the distribution of influential interests (Callaghan & Schnell, 2005; Habermas, 2006). In addition, the concept of mass society tended to emphasize audiences as an aggregate of somewhat passive consumers of party propaganda or media news (Beniger, 1987; Peters, 1996). In contrast to traditional mass media, however, social media have empowered the general public with more choices in news content and direct channels to speak to the press, re-configuring communicative power relations (Loader & Mercea, 2011). As platforms like Facebook and Twitter allow users to share, link, and comment on media content, Internet users increasingly participate in the diffusion of news (Kümpel et al., 2015). While public-generated information is circulated beyond the scope of traditional news media, personal networks that users maintain through social media become important ways to receive and evaluate the news, altering the way individuals are engaging with news (Bruns, 2005; Veil, Buehner, & Palenchar, 2011).

Due to its participatory culture, social media allow amateurs or ordinary citizens to have a great deal of influence over news information, which involves participating in the observation,

creating, sharing, and republishing of web content (Bruns, 2005, 2008; Leadbeater & Miller, 2004). More importantly, the non-professional journalists are found to participate in the news production and distribution through political blogs and social media, leading to a rise in user-generated news, also known as 'citizen journalism' (Bruns, 2005; Veil, Buehner, & Palenchar, 2011). Citizen journalism refers to a range of web-based practices whereby ordinary users engage in journalistic practices outside the former structures of institutional journalism (Goode, 2009). As opposed to traditional media's singular, one-way power over news production and dissemination, citizen journalism fosters decentralized citizen control over information, calling it participatory journalism (Crumlish, 2004; Levine, Locke, Searls, & Weinberger, 2001; Rosen, 2006; Scoble & Israel, 2006; Surowiecki, 2005; Weinberger, 2003, 2008).

The recent changes in news making and distribution urge scholars to revisit many long-standing communication theories and models of news production, mostly aiming to explain fundamentally a one-way flow of information by mass media. The agenda setting theory, for instance, demonstrates that mass media shape public opinion by highlighting specific topics and issues in its coverage (Lerbinger, 2011; McCombs, 2004). The selection of news is almost monopolistically controlled by news media and their journalistic decisions, determining the newsworthiness (Iyengar & Simon, 1993). Therefore, agenda setting has been positioned as a byproduct of the gatekeeping activities of journalists and news media (Groshek & Groshek, 2013). Research concerning agenda setting effects tended to focus on the relationship between news media content and the public agenda using public opinion surveys that asked, "What is the number one problem facing our country today?" The such survey reflects individuals' perceived salience measured by self-reported instruments that rely on aided or free recall (Conway & Patterson, 2008). More recently, scholars incorporate social media in public opinion survey

research as a proxy for people's self-reported opinions and interests (Murphy et al., 2014). Interpersonal conversations about political issues are an important part of the public sphere and social media data provides people's organic thoughts, emotions, and actions expressed instantaneously, which in turn enables opinion detection in real-time (Madge et al., 2009; Russell Neuman et al., 2014; Woodly, 2007).

As social media reflect contemporary social behavior, scholars increasingly view it as a new index of public salience (Hester & Gibson, 2007; Russell Neuman et al., 2014; Shaw et al., 2001). Recent studies show relatively high correlations between public opinion polls and social media posts using automated text analysis, capturing large-scale trends (e.g., O'Connor et al., 2010) and Twitter messages, in particular, were found to be useful as they are short, public, and represent demographic groups of Americans evenly (Vartgo, Guo, McCombs, & Shaw, 2014). Although there is concern about the representativeness of social media data, research consistently demonstrates that the easily accessible and expressive data reflect online issue salience at the minimum (Hosch-Dayican, Aarts, Amit, & Dassen, 2013). Moreover, social media data allow scholars to consider emotions experienced by the public since analyzing emotions and affective feedback has become relatively easy in text-based communication thanks to computational techniques (Alam, Celli, Stepanov, Ghosh, & Riccardi, 2016).

As social media play an important role in information diffusion, agenda setting is no longer conceived of as only a top-down process from media to audiences, but also as a dynamic process where citizen reporting advanced in online spaces can give shape and definition to media and policy agendas among the public (McCombs, agenda setting effects (Russell Neuman et al., 2014). Although a number of recent studies found a reverse flow of information where social media influence the agenda of traditional media (e.g., Lee, Lancedorfer, & Lee, 2005; Sung &

Hwang, 2014; Vargo et al., 2014), the inter-media agenda setting effects between news and social media are yet inconclusive. Scholars argue that the relationship between traditional media and new media seems very complex and dynamic and oftentimes the relationship is bidirectional (Benett & Iyengar, 2008; Russell Neuman et al., 2014; Wallsten, 2007). This may be due to the insufficient consideration of the entities who play the agenda setting role. Previous agenda setting studies on social media tend to treat social media as a homogenous entity and compare it to the agendas of traditional media outlets, such as newspapers and television (e.g., Kushin, 2010; Moon, 2010). However, almost all major media organizations and journalists nowadays have one or more social media accounts and are often the hubs in the Twitter discussion networks, continuously playing news production and gatekeeping roles (Burns, 2011). Thus, the current study categorizes social media users in order to examine the complexity and dynamics of agenda setting effects of social media.

The purpose of this study is to examine inter-media agenda setting effects between traditional news media and social media: whether social media set the traditional news media agenda and if so, who sets the agenda in social media. More specifically, this dissertation aims to understand how the Twitter debate links up to mainstream media outlets and how politicians, journalists, media organizations, and citizens interact in this decentralized and interactive Twitter sphere. Focusing on different types of users and their ability to drive the mainstream news media agenda, the nature of influential users on social media will be examined to understand their roles in the agenda setting process using the 2016 U.S. primary election data. Lastly, theoretical extensions to the nature of new media and traditional news media in the new media environment will proceed.

CHAPTER TWO

New Media

Over the past few decades, the Internet has brought a new dimension of communication that is different from traditional mass media in which the term "new media" has been used to encompass a diverse array of nontraditional outlets, such as weblogs, social media, audiovisual hosting services, e-mails, and chat rooms (Jenkins & Thorburn, 2003). Rice, McCreadie, and Chang (2001) defined new media as computer-facilitated connectivity and interactivity between users and information. As opposed to traditional media, new media enable connection among and between individuals and groups, and information exchange between those members (Walther et al., 2005; Yzer & Southwell, 2008). With the increasing convergence of media, interactivity often refers to users having the potential to be both sources and recipients of content and interaction (e.g., December, 1996). In other words, "interactivity means a process of reciprocal influence" (Pavlik, 1996, p. 135).

Among many new media outlets, blogging continued to attract writers and readers due to its popularity. In 2011, Blogpulse estimated that there were more than 172 million identified blogs and more than 1 million new posts being produced by individuals each day (Blogpulse, 2011). In particular, political blogs provide easily accessible and updated information produced by independent bloggers unaffiliated with professional newsrooms (Lenhar & Fox, 2006). Meraz (2009) argued that the recent popularity of blogs is in part fueled by its interactive format. With the enhanced degree of connectivity, bloggers comment on day-to-day politics and news, attracting increasing amounts of attention from the web public who see them as credible news sources (Johnson & Kaye, 2004;

Smith & Rainie, 2008). In addition, researchers suggested that blogs enhance and facilitate democratic discourse with the inclusion of new voices in the public (Dahlgren, 2005; Gil de Zúñiga, Puig-I-Abril, & Rojas, 2009). Rosen (2006) further highlighted that blogs have brought the press to the people, restoring the balance of power between citizens and traditional media. During the 2008 U.S. presidential primaries, bloggers provided running commentaries about the election in near-real time, using a social media format (Hanson et al., 2011).

Lately, blogs have matured to resemble traditional journalism in form and practice. Top, independent bloggers now hire editors, blog full-time, and engage in first-hand reporting and investigative journalism acts (Bowers, 2007; Stoller, 2007; Strupp, 2008). Consequently, the blogs' credibility has increasingly grown and the blog agenda is becoming a more important influence on the media agenda (Meraz 2009; Wallsten, 2007). It is now difficult to draw a clear line between traditional news media and political blogs, such as *The Huffington Post*, one of the most cited websites in social media, and *The Note*, ABC's news blog. Although such media outlets and mainstream news commonly produce news and serve as a prominent information source, the distinctive features of these digital entities differentiate them from mainstream news in nature. First, such media outlets are niche-based media websites. For instance, *Huffington Post* is left-leaning and *CNT.com* is specialized in technology. Second, they are mostly web-based or oftentimes online-only news media. Third, in addition to their original work, they are designed as news aggregation websites. Such 'digital native news media' rank among the most visited news organizations (Olmstead & Shearer, 2015).

2.1 Social Media and Twitter Networks

More recently, social media have become an essential part of everyday lives as well as our political system. As of 2021, approximately 80% of US adults use social media sites, YouTube and Facebook being the most popular (Auxier & Anderson, 2021). The term "social media" is typically used in reference to the social network sites, such as Facebook or Twitter (Howard & Parks, 2012; Gainous & Wager, 2014). Other popular social media include LinkedIn, Weibo, Snapchat, and Instagram. As a media technology, Internet-based social media provide an additional, more convenient, and affordable channel of communication to supplement traditional media outlets (Barnett, 2011). However, the definition and conceptualization of social media vary depending on scholars, research topics, and contexts. Social media include a broad and growing portion of the Internet that is designed as a platform, which allows users and groups of users to create and exchange content, often in an interactive or collaborative fashion (Kaplan & Haenein, 2010). Boyd and Ellison (2008) underlined interactive communication of social media, defining social network sites as web-based services that allow individuals to construct a public or semi-public profile, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system. Social media like Facebook and Twitter enable high levels of interactivity and allow for diffused and real-time discussions with no geographical constraints (Rafaeli & Sudweeks, 1997). Thus, people are likely to use social media as a means for self-presentation and for building and maintaining contact with others (Donath & Boyd, 2004; Ellison Steinfield, & Lampe, 2007).

Social media also provide platforms for the sharing of digital content and collaboration (Harrison & Barthel, 2009; Murthy, 2012), Howard and Parks (2012)

argued that social media consist of three parts; the information infrastructure to produce and distribute content, the content that takes the digital form, and actors that produce and consume digital content. Digital media technologies are inherently social such that user-generated content also often takes a collaborative form (Hardy, 2007). The collaborative construction of content highlights the production and sharing of a social form of information in which users collectively participate in a continuous manner (Hermida, 2012; Loroche, Habibi, &Richard & Sankaranarayana, 2009; Xu & Fend, 2014). It incorporates the aggregation of collective expertise on individual topics, including commenting, tagging, and rating of information, which is subsequently remixed and redistributed (Harrison & Barthel, 2009). Due to its participatory culture, social media enable amateurs or ordinary citizens to exercise a great deal of power over the news information, involving participating in the observation, creating, sharing and republishing web content (Bruns, 2005, 2008; Leadbeater & Miller, 2004). As a result, the growth of social media usage has led to a rise in user-generated news, also known as 'citizen journalism.'

Citizen journalism refers to a range of web-based practices whereby ordinary users engage in journalistic practices outside the former structures of institutional journalism (Goode, 2009). As opposed to traditional media's singular, one-way power over news production and dissemination, citizen journalism fosters decentralized citizen control over information and has been called participatory journalism (Crumlish, 2004; Levine, Locke, Searls, & Weinberger, 2001; Rosen, 2006; Scoble & Israel, 2006; Suroweicki, 2005; Weinberger, 2003, 2008). Social media have been considered in the context of citizen journalism where individuals and groups provide current affairs-based

blogging, user-generated photos and videos, and eyewitness commentaries (Burns, 2005; Hermida, 2010). In the case of social movements and disasters, in particular, Twitter and Facebook emerged as a prominent source of real-time news before any other media outlets (Schmirerbach & Oeldorf-Hirsch 2012). For instance, during the Mumbai bomb blasts in 2008, Twitter was used to circulate eyewitness accounts and news immediately after the attacks (Beaumont, 2008). From the 2009 Arab uprisings to the 2014 Hong Kong Umbrella Movement, Twitter's identity as a news source is rapidly becoming more prominent, and the service has been recognized as useful news and current events tool (Kwak, et al., 2010; Phelan, McCarthy, & Smyth, 2009; Sakaki et al. 2010).

People use social media to get informed, discuss and participate in politics. For this reason, Twitter has been under academic scrutiny, particularly within the political context (Colleoni et al., 2014; Farrell, 2012). Twitter is a microblogging service that allows users to send 280 characters Twitter messages, known as "tweets", and shortened URLs that lead to pictures or other sites. One can build connections with others through "following" without acquiring approvals, indicating that the relationships in Twitter networks are not always reciprocal. One of the distinctive features of Twitter is its ability to disseminate information. For instance, contents are easily sharable with the followers by "retweeting" a message that increases visibility, and the system of hashtags (#) and mentions enables the creation and identification of discussion on a particular topic. Mentions also enable users to converse directly with other specific users, thus sustaining a high level of interactivity and engagement among users who seek to connect and converse (Honey & Herring, 2009). This oftentimes reflects what issues are newsworthy capturing people's attention and displaying aggregate interests and attention (Hermida,

2012; Murthy, 2012). Such real-time information dissemination makes Twitter both a

"social" and "newsy" medium (Kwak et al., 2010).

CHAPTER THREE

Agenda Setting Theory

Mass media play an important role in shaping public perception and opinion, as they set the public agenda by highlighting certain issues and increasing their salience (Dearing et al., 1966; Lippmann, 1922; McCombs, 2004). The degree of emphasis placed on issues in the mass media influences the priority accorded to these issues by the public (McCombs, 2004; McCombs & Ghanem, 2001). As McCombs and Shaw (1972) famously put by quoting Cohen (1973), "The press may not be successful much of the time in telling people what to think, but it is stunningly successful in telling its readers what to think about" (p.177). Known as agenda setting effects, the conceptualization of agenda setting was advanced by McCombs and Shaw (1972) in their Chapel Hill study. The public agenda is volatile; problems surge and decline in rapid succession as focal points of public attention and concern and news media have a strong influence on the issues the public view as important (Behr & Iyengar, 1985). Agenda setting theory has been one of the dominant frameworks to study mass media effects, evolving from a hypothesis about media effects on the public to a research paradigm that examines the transfer of salience at all levels of political discourse (McCombs & Reynolds, 2009).

Rogers, Dearing, and Bregman (1993) considered agenda setting as a process with three subareas: public agenda setting, policy (political) agenda setting, and media agenda setting. Both political elites and mass media play a significant role in construing social issues which in turn, shape public concern around those issues (Bennett 1980; Dearing & Rogers, 1993; Iyengar & Kinder, 1987). The media agenda is constructed through an interactive process between the news media and their sources, such as the president,

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political campaigns, public relations, and issue interest groups (McCombs, 2004; Shoemaker & Reese, 1991). Scholars found that the influence of political agenda on media agenda is contingent upon the type of the issue concerned (Walgrave & Van Aelst, 2007; Wanta & Foote, 1994). While the news media tend to have more political agenda setting power over issues regarding social problems, the political agenda tends to set the media agenda for the issues regarding the international crisis and government administration (Walgrave, et al., 2008; Wanta & Foote, 1994). In the United States' foreign policy, the president is considered to be the dominant player (Kegley & Wittkopf, 1996). Social problems, on the other hand, have tangible and concrete consequences on the people, often sparked by sensational events (Walgrave et al., 2007), and thus, the news media are likely to lead politics. For instance, the news media played a prominent role in the growth of political attention on global warming issues (Trumbo, 1995). In this regard, Dearing and Rogers (1996) concluded that "the agenda setting process is an ongoing competition among issue proponents to gain the attention of media professionals, the public and policy elites" (p.1).

3.1 The Evolution of Agenda Setting Theory

Since the work by McCombs and Shaw in 1972, hundreds of studies have examined agenda setting effects in different contexts. The vast majority has found support for the notion that media coverage influences the perceived importance of issues. From surveys to laboratory experiments, agenda setting effects have been captured for all forms of mass media coverage and for both local and national problems (Iyengar & Kinder, 1987; Rogers & Dearing, 1988). By analyzing data from 1988 to 1990, Iyengar and Simon (1993) found agenda setting effects regarding the Gulf War crisis. Subsequent

studies refined the theory by examining different types of audiences, time lags, and media (McCombs, 2005). For instance, a 23-year span of a longitudinal study revealed agenda setting effects of the New York Times on the rise and fall of public concern about the civil rights issue in the United States (Winter & Eyal, 1981).

While initial agenda setting studies were limited to examining newspapers, scholars also found evidence of agenda setting by television news (Behr & Iyengar, 1985). As television news programs started to serve as an important source of information for the public, issues and events highlighted by television news become especially influential (Iyengar, 1994). During this period, the agenda setting effects were unidirectional; news coverage boosted public concern but public concern did not, for the most part, alter the level of coverage (Behr & Iyengar, 1985). Following studies found that the agenda setting effects were not limited to news media, such that entertainment media also influenced the audience' issue priority. For example, Holbrook and Hill (2005) showed that the viewing of crime dramas significantly increased concerns about crime and that those concerns affected viewers' opinion of the president.

The central focus of agenda setting studies is issue salience and has been operationalized in a variety of ways on both the media agenda and the public agenda. According to Kiousis (2004), media salience has three dimensions: prominence, valence, and attention. The prominence of the news about an issue focuses on page placement, size of headline, amount of time, and space devoted to the issue. Valence is reflected in the amount of conflict or the overall tone of the story. Much of the research addressed attention as issue salience, which is measured by the number of news stories covering a particular issue (McCombs, 2004). The measurement of public agenda, on the other hand,

mostly relies on public opinion surveys asking respondents to identify the most important problems facing the country as well as with closed-ended items in which they rate the importance of particular issues (Iyengar et al., 1982; McCombs, 2005). Finally, the basic causal model posits that correlations between the aggregated measures of media issue coverage and public opinion survey measures of issue importance at a single point in time represent evidence of media agenda-setting (McCombs, 2005).

Extending beyond the original agenda setting hypothesis focusing on the relationship between mass media and public opinion, scholars found that the media agenda is also shaped by other media outlets (McCombs & Shaw, 1993). This line of research attempts to answer the question 'if the media set the public agenda, then who sets the media agenda' (McCombs, 1993; Rogers et al., 1993). Known as inter-media agenda setting effects, the theory explains that media imitate each other and set the agenda of other forms of media, such as newspapers, magazines, television, and radio (Dearing & Rogers, 1996; Gilberg et al., 1980; Mathes & Pfetsch, 1991). Vonbun et al. (2016) suggested that inter-media agenda setting depends on the production cycles of the media outlets, the opinion-leader media, the characteristics of issues, and the geographical proximity of media outlets to issues.

Several studies found that elite newspapers tend to influence the agendas of TV news and less elite media outlets (Vlieenthart & Walgrave, 2008). In particular, major news media, such as the *New York Times* and *Associated Press*, play the role of inter-media agenda setter (Reese & Danielian, 1989; Whitney & Becker, 1982). For instance, animal abuse in U.S. horse racing did not gain media attention until this issue appeared in the *New York Times* (Denham, 2014), and Golan (2006) found inter-media agenda setting

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influence of the *New York Times* over the international news agenda of three leading

American network television news.

Inter-media agenda setting effects have also been found on the Internet. Earlier

studies demonstrated issue homogeneity across online and offline media, suggesting that

communication technologies are diminishing the boundaries of media networks that

enable content to travel across various media platforms as the dominant online news

sources tend to be affiliated with established media organizations (Boczkowski, 2004; de

Sola Pool, 1983; Heim 2013). For instance, high correlations were found between online

newspapers (the *New York Times* and the *Washington Post*), online cable news (*CNN* and

MSNBC), and online news services (*Yahoo News* and *Google News*) ranging from +.51 to

+.94 (Yu & Aikat, 2005) and elite online newspapers influenced the issue agendas of

secondary newspapers and online wire services (Lim, 2006). Vonbun et al. (2016)

similarly contended that many media companies use their websites to publish articles

online before they appear in the printed newspapers and found that online media

preceded print media coverage in Austria.

Although the major forms of traditional elite media generally shape the agenda for

other media, non-major media outlets also often possess considerable leadership and

influence the agenda of elite media depending on issue characteristics (Mathes & Pfetsch,

1991). Certain issues, such as environmental information, were first discussed by special

interest magazines (Strodthoff, Hawkins, & Schoenfeld, 1985) and political

advertisements and campaign websites were found to shape the agendas of major

newspapers and network television news stories during the presidential election (Ku,

Kaid, & Pfau, 2003). Moreover, scholars pointed out that issue obtrusiveness decreases

agenda setting effects as obtrusive issues are observable by more people, and thus encourage independent reporting (Soroka, 2002; Zucker, 1978).

3.2 Social Media and Agenda Setting Effects

More recently, the inter-media agenda setting theory has been applied to study the relationship between traditional news media and social media where individual users are the creators of the content. Some early work shows that the Twitter agenda generally follows the news media agenda (Parmelee & Bichard, 2012; Vargo et al., 2014), demonstrating how social media allow ordinary people influence the mainstream media agenda (Hermida, 2010). Groshek and Groshek (2013), for instance, found that Twitter was more likely to follow traditional media than the reverse in their 2010 U.S. Midterm election study. Similarly, the two major elite newspapers, the *News York Times* and *Washington Post* were the most popular sources of news on political blogs, following the mainstream media agenda (Meraz, 2009; Scott, 2005). As traditional media outlets are increasingly using social media to maintain the traditional media agenda and direct readers to their own websites (Yun et al., 2016), greater reliance on traditional media than on online platforms was observed (Reese, 2007). Other research, however, found that social media are beginning to weaken traditional media's agenda setting power (Maier, 2010). Scholars increasingly view social media as equivalent to mass media, or even traditional news media, maintaining that social media have a direct impact on the public, as well as the news media, in the same way as traditional gatekeepers (Chouliaraki, 2008; McCombs, 2005).

With the rise in citizen journalism, a number of studies found evidence of a reverse flow of information as opposed to the traditional model of unidirectional flows

from news media to citizen media. In this line of research, scholars focus on social media's ability to influence traditional media's agenda, as Twitter messages and Facebook posts are increasingly quoted in news coverage. Wigley and Fontenot (2011) found that the amount of citizen-generated content referenced in traditional news reports increased from 6.5% (with regard to the 2007 Virginia Tech shooting) to 9.5% (with regard to the 2011 Tuscan shooting). Political blogs were found to set the traditional media's online news agenda during the presidential election (Meraz, 2011; Sweetser, Golan, & Wanta, 2008) and Twitter initiated an outbreak of a crisis, such as terrorist attacks in Mumbai and the revolution in the Middle East (Murthy, 2011) while traditional news media followed and disseminated these reports (Hermida, 2012; Sung & Hwang, 2014). Wu et al. (2013) noted that Weibo played a critical role in reporting a railroad accident in China without editorial censorship, setting the mainstream media agenda with a one-day delay and providing a citizen forum. In addition, issues that are often discussed on Twitter are subsequently addressed in blogs, radio shows, and news articles, such that Twitter, in many cases, influences the agenda across all platforms (Parmless & Bichard, 2012).

Despite recent findings of the reverse flow of information, research on social media as an agenda setter is a relatively new area and results are yet inconclusive. Scholars suggest that media technologies have created a multifaceted media environment, allowing reciprocal influence across a wide range of media outlets (Rogstad, 2016). Kwak et al. (2010) found that over 85% of trending topics on Twitter are headline news topics or persistent news topics, making it difficult to pinpoint the direction of influence. Such mixed results may be due to the fact that scholars tend to consider Twitter as a

homogenous single entity, in some cases, equivalent to public opinion (e.g., Russell

Neuman et al., 2014). However, this is a very simplistic definition inconsistent with the

nature of social media, which consists of multiple publics and various users. Ordinary

citizens are not the only ones who produce information on Twitter; rather journalists and

celebrities are often the hubs in a Twitter discussion network (Bruns, 2011). In 2009, for

instance, celebrities Ellen DeGeneres, Ashton Kutcher, CNN breaking news, Al Gore,

and Barack Obama had the most followers on Twitter, while news media messages were

most retweeted (Kwak et al., 2010). Similarly, Garcia de Torres et al. (2011) found that

50% of Twitter messages and 68% of Facebook postings are headlines with a link back to

the news website as many news organizations have turned to Twitter to distribute their

content (Schmierbach & Oeldorf-Hirsch, 2012). Many newsrooms also use Twitter as an

automated feed of the latest news articles to promote their stories (Hermida, 2012). Yun

et al. (2016) found that Twitter accounts owned by media organizations were more likely

to stay continuously active and effective in information diffusion compared to individual

users. In other words, what people encounter on Twitter oftentimes may not be the

product of ordinary citizens but that of political and media elites, indicating that the

offline opinion leaders are continuously influencing the online agenda. Here, Twitter is

an effective platform to distribute traditional media messages.

    As Castells (1996) predicted, new communication technologies did not eliminate

hierarchies as such technologies give enormous power to those already in a position to

control information, and it is the elite traditional media entities that dominate the

resources on social media. Thus, the commonly used measures of agenda setting effects,

the aggregation of news media content and Twitter messages and simple time-lag

correlation tests, may not be sufficient to examine the inter-media agenda setting effects as the analysis only demonstrates multi-platform content journalism production, and that it is the media and political elites, not the user-generated content, who shape the social media agenda and ultimately influence the news media agenda. Alternatively, the amount of information created by citizen journalists needs to be distinguished from the amount of news created by political and media elites. In this regard, the current study attempts to identify the agenda setters in social media in order to answer the question "who sets the agenda."

3.3 Social Media and Political Communication

In its early days, journalists and scholars may have underestimated the potential of Twitter in political communication. *New York Times* columnist Maureen Dowd (2009) once described Twitter as ''a toy for bored celebrities and high-school girls'' and Lenhart, Madden, MacGill, & Smith (2007) similarly contended that the majority of contributors to Twitter are teenagers. With the increase in social media use by political elites and journalists, however, Twitter now has become the most popular form of media for engaging in political communication (Parmelee & Bichard, 2012). Within traditional journalism, information and quotes from government officials are the main source of political news drawn from interviews, press conferences, press releases, and official proceedings (Bennett, 2012; Sigal, 1973). This news model, however, is now in a period of transition. Social media technologies facilitate the immediate dissemination of digital fragments of news and information from both official and unofficial sources over a variety of systems and devices (Hermida, 2010). In addition, Twitter provides journalists

access to real-time information from many types of sources, and a useful marketing tool to increase their readership (Ahmad, 2010; Hermida, 2012)

Twitter has been widely adopted by politicians as they started to use social media as "a privately owned publicity channel" and to impact the news agenda (Lassen & Brown, 2011, p.423). Many politicians these days no longer solely rely on press conferences to send a message to their constituents but rather use Twitter to comment on major issues. For instance, the Obama administration went on to social media in order to promote Obama health care coverage and its website, mainly targeting young generations. President Obama himself appeared on a video clip and it was viewed 42 million times within 4 days. Consequently, President Obama was able to build a robust presence on social media in addition to successful campaigning. Mitt Romney, the formal Republican presidential candidate, expressed his opposition to the Confederate flag in 2015 on Twitter after the North Carolina Charleston church shooting, as well as his condemnation of the 2016 Republican presidential candidate Donald Trump. Donald Trump also has been actively present on Twitter throughout his campaign, and his controversial tweets and retweets often made headlines in newspapers. Allowing politicians to directly communicate with the electorate, Twitter provides a venue for politicians to make connections, mobilize supporters, and promote their policies (Lassen & Brown, 2011). Social media enable politicians to present themselves as relational objects with which voters can personally associate (Lee, 2013). Furthermore, politicians' social media messages often serve as raw materials for the mainstream media, reaching a wide range of audiences and influencing the media agenda (Levinson, 2011). The use of social media by politicians resembles the 'going public' electoral strategy whereby a

president speaks directly to citizens to build public support for policies and generate positive news content (Kernell, 2007). Studies showed that direct communication between politicians and citizens tends to narrow the psychological distance (Bimber & Davis, 2003) and such perceived closeness leads to a favorable reaction toward politicians (Lee & Shin, 2012).

Journalists are heavy users of social media for their job (Farhi, 2009; Lasorsa et al., 2012; Sheffer & Schultz, 2010) and often find story ideas and sources from Twitter (O'Connor, 2009; Parmelee & Bichard, 2012). In fact, news editors encourage citizens to share their photos and experiences, especially during an international crisis when firsthand reporting is difficult. CNN, for example, asks its readers to use *#CNNiReport* in its social media message, also identified as corporate-sponsored citizen journalism, attempting to create a collaborative community through its website (Palmer, 2013). Broersma and Graham (2012) emphasized that Twitter messages that contributed to news agenda served three functions for journalists: "They are either considered newsworthy as such, were a reason for further reporting, or are used to illustrate a broader news story" (p.403). Thus, both citizens and political elites are potentially able to influence the news media agenda through social media as opposed to the traditional model of agenda setting theory that only highlights the one-way agenda setting influence of news media organizations and politicians.

3.4 Opinion Leaders and Influential Users

Since the emergence of new media, another important question researchers attempted to answer is the extent to which individual users influence information diffusion on social media which allows users to create, select, and filter relevant media

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content (Aday et al., 2013). Within the traditional mass media context, social influence among citizens was conceptualized as a two-step flow process, with news flowing from opinion leaders to followers (Katz & Lazarsfeld, 1955). Opinion leaders were characterized by a greater level of media attention and issue-specific knowledge and having substantial access to information and platforms for disseminating information (Rogers, 2003). Diffusion studies identified opinion leaders to be innovative individuals who are highly involved and have relatively high social status and vast social connections (Weimann, 1994). More recent work identifies opinion leaders as those who diffuse information or advice by discussing issues with other people in various forums with the hopes of shaping opinions (Vishwanath & Barnett, 2011). That is, opinion leaders are the gatekeepers of information, in which other members of a group actively seek out information or advice (Burt, 1999).

Information increasingly comes from sources not designated by journalists or mainstream media, and it travels over social media that enable access any time (Bennett, 2012), which in turn changed the meaning of opinion leaders or in some contexts, influential users. Scholars suggest that influential users are the ones who are able to control and contribute information and influence others' viewpoints and behaviors (Chat et al., 2010; Weimann et al., 2007; Xu et al., 2014). The structural aspect of opinion leadership underlines that opinion leaders are central players in the social network and have wide social connections (Valente & Pumpuang, 2007). Studies of digital marketing showed that opinion leaders in online blogs were more knowledgeable, occupied the more central position in the network, and had a large number of friends, views, and feedback from other individuals (Li & Du, 2011; Yang & Ng, 2007). Hauffaker (2010)

defined online leaders as people who can trigger conversation within the community and found that engaging in more communication activities and the length of time spent within a group were positively related to opinion leadership, showing higher frequencies of talkativeness, assertiveness, betweenness centrality, and reciprocity.

Within Twitter networks, studies used different approaches to measure user influence and can be summarized as follows. First, the number of followers was considered to represent the popularity of a user, identifying "who listens to whom" (e.g., Cha et al., 2010; Maireder et al., 2017; Wu et al., 2011). Second, the number of retweets, which indicates the content value of one's message was used to measure a user' ability to influence information flows (e.g., Cha et al., 2012; Romero et al., 2011; Starbird & Polen, 2012; Xu et al., 2014; Yamaguchi et al. 2010). Third, the amount of Twitter messages one receives, also known as mentions, reflects the name value of a user, which is evidence of the ability of a user to engage others in a conversation (Cha et al., 2011; Wu et al., 2011). Lastly, one's ability to produce information and impact issue salience was used to determine user influence by looking at the number of messages one has created (Poell & Borra, 2011). Results commonly show that the elite users, such as news organizations and celebrities, are the most influential and these key actors play an important role in forming links between various users, holding significant influence over various topics (Cha et al., 2010; Marieder et al., 2014; Wu et al., 2011; Yamaguchi et al., 2010).

3.5 User Dynamics in Twitter Networks

Although offline authorities continue to have a high influence on Twitter networks, people of varying socioeconomic status, including those who have limited

influence in the offline world, produce massive amounts of information on social media (Suler, 2004; Xu et al., 2014). User accounts in Twitter are of various types, ranging from the President of the United States to a girl next door. Although researchers maintain that the dissemination of information on Twitter depends on users and their networks (Choudhury et al., 2012; Hermida, 2010; Yamaguchi et al., 2010), not many studies considered the extent to which users contribute to agenda setting on Twitter. Early studies attempted to classify users based on their role in information production: information source, friends, and information seeker (Java et al., 2007). Subsequent research centered on distinguishing between elite users and ordinary users. Wu et al. (2011) conceptualized elite users as celebrities, bloggers, and media organizations and used keywords to identify them, such as celebs and Hollywood for celebrities and corporations for organizations. Based on the number of followers and messages received, the top 5000 users from each category were classified as elite users and all the remaining users as ordinary users. Similarly, Yamaguchi et al. (2010) considered the most influential users as "authoritative users." Choudhury et al. (2012) classified users as organizations, journalists/media bloggers, and ordinary individuals based on the number of followers, followings, posts, retweets, named entities, and topic distribution.

Other studies focused on organizations. In their study, Starbid et al. (2010) analyzed Twitter messages on Red River Valley flooding in order to identify user-generated content during a crisis. The categories included blogs, faith-based organizations, flood-specific services, public service agencies, national media, alternative media, other services or organizations, news crawlers, local media, and individuals. Results indicated that 37% of users were unaffiliated individuals and a small number of

flood-specific services were responsible for 44% of Twitter messages regarding Red River Valley flooding. Maireder et al. (2017) categorized users in terms of their role in the political system based on users' profile descriptions. They only focused on the top 400 influential users and classified them according to 13 categories: media organizations, journalists, political parties, politicians, NGOs, political activists, companies, individual company executives, research institutions, scholars, cultural institutions, artists, and others. Analyzing Twitter messages addressing the Transatlantic Trade and Investment, authors found that 47.75 % of the users were organizations and 42.5% were individuals while NGOs and activists had the most accounts. Focusing on flu related Twitter messages, Yun et al. (2016) identified the most central 700 user accounts which were categorized into media/health related users, media companies, organizations, and individual users. Prior studies used varying categories depending on the purpose of the research although most of them only considered highly connected users in their analyses, presuming that network properties and the number of followers/following define user types. The assumption that all elite users are influential but ordinary users are not based on the raking of individual users may not accurately reflect the participatory attributes of Twitter, which proliferates on user-generated content.

3.6 Hypotheses and Research Question

The current study aims to examine inter-media agenda setting effects between traditional media and social media. With the increased use of social media for news and civic participation, it is important to understand the role social media play in the agenda setting process. Research to date on social media as an agenda setter was limited to viewing Twitter as a single homogenous entity, often equivalent to public opinion.

However, this conceptualization is not in line with the nature of social media, which consist of multiple publics and various actors including citizens, media organizations, journalists, and politicians. Furthermore, literature on social media suggests that various actors on social media differ in the extent to which they are able to affect the discourse. From this perspective, the complexity and dynamics of agenda setting effects of social media deserve further clarification. The present research fills the gap by examining the agenda setting effects of different types of social media users with varying degrees of user influence. In addition, the current study draws a line between user influence and user types as the two measures reflect different aspects of user dynamics and shift the attention from a limited number of highly influential accounts to the entire users who participate in the process of agenda setting. Based on the literature review, the following hypotheses and research questions are suggested:

H1. Inter-media agenda setting effects

> H1a. The salience of issues on Twitter will be positively related to the salience of issues in mainstream news media.

> H1b. The salience of issues of media organizations on Twitter will be positively related to the salience of issues in news media

> H1c. The salience of issues of politicians on Twitter will be positively related to the salience of issues in news media

RQ1. What is the overall relationship between Twitter's agenda and newspapers' agenda?

RQ2. Which user groups are most influential in social media?

RQ3. Who sets the agenda? What type of users set the agenda?

CHAPTER FOUR

Methods

4.1 Research Design

The purpose of this study is to examine inter-media agenda setting effects between traditional news media and social media: whether or not social media set the traditional news media agenda and if so, who sets the agenda in social media. More specifically, the current study focuses on different types of users in Twitter networks and users' characteristics to determine social media's ability to drive the mainstream news media agenda when both journalists and citizens have access to the news sources. Data were collected during the 2016 U.S. primary election by sampling online versions of national newspapers on three different specific issues. The current study focused on social issues because citizens are less likely to have an impact on other types of issues, such as international affairs, defense, and economic issues, thus it is difficult for citizens to compete with professional journalists. Research shows that Twitter's agenda setting influence depends on issue types such that the public continues to trust official news on certain issues (Russell Neuman et al., 2014). From campaign rallies to candidates' Twitter messages, the primary election provides a good context for evaluating citizen journalism as ordinary citizens have direct access to the news events. Different types of Twitter users were identified based on users' profile descriptions and users' influence in Twitter networks was measured based on the positions in the networks of following/follower relationships. Scholars may see more fruitful results from a blended approach to content analyzing big data—one that combines computational and manual methods throughout the process, and thus the user types were hand-coded. Such an

approach can retain the strengths of traditional content analysis while maximizing the accuracy and efficiency of examining big data. The resulting data were analyzed with Granger causality analysis, which has been used as the methodological tradition of the previous agenda setting studies (Meraz, 2009).

4.2 News Sample Selection

In order to measure the amount of news coverage related to specific issues, news articles were collected from national news including *Fox News, CNN, MSNBC, USA Today, New York Times, Washington Post, Time, Huffington Post, CBS News, ABC News, NBC News, Wall Street Journal* and *LA Times*. All news articles were collected from the respective news websites. An additional search was conducted by using the LexisNexis Academic database.

This set of news sources was selected for several reasons. First, elite newspapers were found to have inter-media agenda setting effects on the agendas of television news and local newspapers (e.g., Golan, 2006; Protess & McCombs, 1991; Reese & Danielian. 1989) as well as online discussion (Robert, Wanta & Dzuo, 2002). Second, these news sources provide a broad geographical representation in order to avoid regional biases in coverage. Third, they include all spectrums of ideologies; the traditionally ''liberal'' news entities such as MSNBC as well as the so-called conservative outlets such as FOX News.

4.3 Twitter Data Collection

Twitter messages were gathered through the Twitter API (Application Programming Interface) including the words of specific issues every day. The details of search terms will be discussed in the next chapter. Next, the profile description and

following/ follower relationships for all users were collected using NodeXL, a network analysis tool. Several inactive accounts and accounts with restricted privacy settings were excluded from the further analysis.

4.4 Coding Criteria for User Types

To identify who is participating in information production and distribution and to distinguish between elite users and non-elite users, Twitter user accounts were coded based on their profile descriptions. For the purpose of this study, 9 categories were used to classify users:

Professional Journalists are individuals who are associated with news organizations or institutions including political commentators.

Politicians/political parties include elected officials, primary election candidates, and U.S. political parties.

Celebrities are accounts of public interests and famous individuals. To ensure its authenticity, only Twitter verified accounts were considered.

Citizens are individuals who do not fall under journalists, politicians, and celebrities.

Media Companies include mass media enterprises and news organizations

Non-media Companies include business entities.

Interest groups are social-political interest groups associated with social or political goals (e.g., NRA or gay rights groups). The existence of official website was one of the determinants to ensure its authenticity.

News Aggregators gather and repost news stories from different sources usually on a certain topic. Given the characteristic of the issues in interest, most of the

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news aggregator accounts were on politics. Other topics included fashion, celebrity gossip, and wine.

News Blogs include independent news blogs that are affiliated with mainstream news media companies

Coding was performed by five coders: the author and four undergraduate research assistants. Coders were first instructed to classify users based on the account information including names and profile descriptions. Each account's activities (e.g., Twitter messages) were considered when the information provided by users was not adequate or reliable. Coders familiarized themselves through training sessions and a pretest was conducted to identify problems with the coding scheme. Coders discussed and refined items that they disagreed. A randomly selected subsample of 1000 accounts was examined to assess intercoder reliability (Krippendorff's $\alpha = .86$).

4.5 Measures

Users' influence was examined by using network analysis. Network analysis is a set of research methods identifying structures in a system based on the relationships among entities in the system (Rogers & Kinacid, 1981). Here, entities are Twitter users and the relationships are follower and following, thus the flow of influence in the network can be traced by focusing on these relationships (Rogers & Kincaid 1981; Monge & Contractor 2003; Leydesdorff 2007). A follower is a user who follows a Twitter user, and a following refers to the Twitter user that a user subscribes to. In other words, followers represent incoming links and followings indicate outgoing links. In this study, user influence is measured by degree centrality, which refers to the number of connections between a node (user) and all other nodes in the network (Wasserman &

Faust, 1994). The degree centrality measure is important because it reveals the level of connectivity as well as the networks that shape the information people are exposed to in Twitter (Maireder & Schlögl, 2014). The higher degree centrality indicates a higher level of connectivity (Neuman, 2010). In this study, two measures were considered:

Out-degree centrality. Out-degree centrality describes a user's connection to other users via the number of outgoing links (following).

In-degree centrality. In-degree centrality measures show the number of ties a node received from other users (followers).

4.6 Data Analysis

A time-series analysis has been commonly used to determine a causal relationship in agenda setting research, particularly in inter-media studies (Meraz, 2009, Walgrave, Soroka, & Nuytemans, 2008). Granger Causality test, one of several tests available in time series analysis, allows prediction of the media agenda based on lagged values of its past agenda and those of other types of media and is argued that it can provide a more accurate result than other time-series methods (Bressler & Seth, 2011; Freeman, 1983; Schelter, Winterhalder, & Timmer, 2006). Granger Causality tests indicate the direction of statistical causation between two time-series variables and a measure x is said to "Granger cause" a measure y, if y can be better predicted from past values of x and y together than the past values of y alone (Freeman, 1983). This dissertation examines issues agendas on Twitter and compares them with the coverage of these issues by mainstream news media. The details of the analysis will be discussed in the next chapter.

CHAPTER FIVE

STUDY 1

Issue 1. Trump and Abortion

During a town hall event, Donald J. Trump, then-Republican presidential candidate, said that he believes there should be some form of punishment for women who undergo illegal abortions. Trump's controversial remarks immediately attracted the attention of the media and other presidential candidates, adding their remarks on the issue. Later that day, Trump's campaign recanted his statement, claiming that the doctor or any other person performing the illegal abortion should be held legally responsible if abortion is banned under state and federal law.

5.1 Results

The current study explored the inter-media agenda setting effects between social media and traditional media. Data consist of the daily volume of Twitter messages and online news articles collected from March 30, 2016, to April 30, 2016. Using the two keywords "Trump" and "abortion", a total of 189,516 Twitter messages and 537 news articles were collected. Figure 1.1 shows the daily amount of media coverage and Twitter messages.

Inter-Media Agenda Setting

Time series analysis has long been recognized and utilized as a robust method for determining causation in agenda setting studies, including inter-media agenda setting effects. Past studies suggested that Granger causality can provide a more accurate result than other time series methods, as it indicates the direction of statistical causation between two time-series variables (Bressler & Seth, 2011; Schelter, Winterhalder, &

Timmer, 2006). Applying Granger causality analysis to this study permitted predictions of each media network's agenda based on lagged values of its past agenda and those of other media networks. Findings show that Twitter Granger caused news media attention ($\beta = 3.94$, $p = .058$), but not the other way around. Twitter showed immediate agenda setting effects after one day, but such effects dissipated in the ensuing days (see Table 1.1). H1a is supported.

5.2 Discussion

In line with the agenda setting theory and previous inter-media agenda setting studies, inter-media agenda setting effects were found between social media and news media. The findings show that overall Twitter sets the media agenda on the Trump and abortion issue during the primary election. The immediacy and the speed of online communication have shortened the time lag of online agenda setting, as it occurred within a day but the attention to the issue decreased thereafter.

CHAPTER SIX

STUDY 2

Issue 2. Koch Brothers

Koch Brothers, the founders of Citizens for Sound Economy and owners of Koch Industries, are known for their influence over American politics by funding a number of conservative organizations. Koch brothers were under the spotlight during the 2016 primary election because of their interview implying their support for Vermont Senator Bernie Sanders, one of the Democratic Party candidates, despite their different stances on politics. Koch Brothers gained much of media attention once again when Hillary Clinton referred to them as secret friends of Bernie Sanders during the Democratic presidential debate.

6.1 Results

The current study explored agenda setting effects between social media and traditional media as well as user dynamics and its role in the agenda setting process. User influence was measured through network analysis and content analysis. Data consist of the daily volume of Twitter messages and online news articles collected from March 5, 2016, to April 2, 2016. Using the keyword "Koch brother", a total of 2647 Twitter messages and 191 news articles were collected. Figure 2.1 shows the daily amount of media coverage and Twitter messages.

Dynamics of Twitter Users

As Table 2.1 indicates, the majority (68%, $n = 1805$) of the accounts were run by citizens. A total of 2.4% ($n = 64$) and .15% ($n = 4$) of the accounts were maintained by journalists/media companies and politicians respectively, while 3.06% ($n = 81$) of the

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accounts were run by news aggregators. Among the top 10 central users by in-degree, 5

of them were media companies and 4 of them were citizens, while 8 out of the top 10

central users by out-degree were citizens (see Table 2.2). A graphic illustration of the

structure of the Twitter network is presented in Figure 2.2. The average in-degree

centrality for citizens and media companies was .0012 and .0419 respectively. As

indicated in Table 2.3, 38% of the media organization accounts, 12% of the citizen

accounts, 25% of the news aggregator accounts, and 49% of the journalists were in the

high-influence group by in-degree. Approximately two-thirds of the citizens (72%) are in

the mid-influence group. Results demonstrate that citizens tend to have a high level of

connectivity through following other accounts while media companies are less likely to

reach out to others but more likely to receive ties.

Inter-Media Agenda Setting

Applying Granger causality analysis, findings show that Twitter Granger caused

news media attention on the Koch Brothers issue but not the other way around. Twitter

showed immediate agenda setting effects for the issue for Day 2 (β = 14.275, p < .001),

through Day 4 (β = 14.275, p < .001) and such effect dissipated in the ensuing days.

Evidence supports that the social media agenda influences news media, thus H1a is

supported (see Table 2.4).

When the influence group was examined, the findings in Table 2.5 indicate that

the medium-influence group (β = 4.78, p < .05) and the high-influence group (β = 6.20, p

< .01) by in-degree Granger caused media attention to Koch brothers. Similarly, the

medium-influence group (β = 6.33, p < .01) and the high-influence group (β = 8.30, p <

.01) by out-degree Granger caused traditional news media's agenda (see Table 2.6). The

relationship between Twitter and news media dissipated after Day 3, consistent with the optimal time lag.

6.2 Discussion

Results show that Twitter generally has agenda setting effects on news media. More specifically, accounts attracting a substantial amount of followers and active information seekers who follow a number of Twitter users have influence on the media agenda. Many of the influential users in the network are media organizations utilizing Twitter to distribute media content and they had the most agenda setting power on news media. Information seekers are mainly ordinary citizens who also have an impact on the news media agenda, indicating that news media pick up what is being discussed by information-rich citizens. Study shows that the social media agenda is a mix of the public and media agenda, ultimately contributing to the media agenda.

CHAPTER SEVEN

STUDY 3

Issue 3. Trump and Ku Klux Klan

Ku Klux Klan (KKK) is classified as a hate group by the Anti-Defamation League and the Southern Poverty Law Center, representing "the oldest single-purpose terrorist organization in the world maintaining the same title and focus" (Quarles, 1999, p.8). Donald J. Trump, then-Republican presidential candidate, received much media attention when David Duke, a former leader of the KKK, publicly endorsed Trump. In addition to Trump's broad support among neo-Nazis, white nationalists, and other members of the far-right groups, Trump's initial refusal to disavow David Duke during press interviews raised wide criticism and protest against Trump.

7.1 Results

Data consist of the daily volume of Twitter messages and online news articles collected from March 20, 2016, to April 25, 2016. Using the keyword "Ku Klux Klan, Trump" and "KKK, Trump", a total of 55,382 Twitter messages and 176 news articles were collected. Figure 3.1 shows the daily amount of media coverage and Twitter messages. Agenda setting effects between social media and news media were tested and the influence of user dynamics in the process was examined.

Dynamics of Twitter Users

Results show that 97.5% of accounts were run by citizens and .08% were maintained by journalists and media companies (See Table 3.1). As table 3.2 indicates, both media companies and citizens showed high levels of connectivity but in different ways. Among the top 10 central users by in-degree, 5 of them were media companies and

2 users were celebrities, while 9 out of the 10 most central users by out-degree were citizens. A graphic illustration of the structure of the Twitter network is presented in Figure 3.2. The average in-degree centrality for citizens and media companies was .0004 and .0694 respectively, and the average out-degree centrality for citizens and media companies was .0063 and .0418 respectively. As noted in Table 3.3, 72.5% of the media company accounts, 12.5% of the citizen users, and 43.8% of the journalists were in the high-influence group. Almost two-third of the citizens (72%) were in the mid-influence group, while 25% of the media companies and 46.3% of the journalists belonged to the mid-influence group.

Inter-Media Agenda Setting

Applying Granger causality analysis to this study permitted predictions of each media network's agenda based on lagged values of its past agenda and those of other media networks. Overall, inter-media agenda setting effects were found between news media and Twitter. As indicated in Table 3.4, findings show that Twitter Granger caused News media attention on the Ku Klux Klan and Trump issue ($\beta = 5.14$, $p < .05$), but not the reverse relationship. Twitter showed immediate agenda setting effects for the issue after Day 1, but such effects dissipated in the ensuing days. H1a is supported.

When users' influence was considered, the high-influence group by in-degree ($\beta = 11.97$, $p < .01$) and by out-degree ($\beta = 10.275$, $p < .01$) Granger caused the media agenda on KKK and Trump (Table 3.4). As indicated in Table 3.6, the Granger causality between the mid-influence group by in-degree was marginally significant ($\beta = 3.34$, $p = .08$). As presented in Table 3.7, a significant Granger causality was found between news media and Twitter where news granger caused the issue agenda of the high out-degree

influence group (β = 4.82, p < .05) and the low out-degree influence group (β = 22.372, p < .05). The relationship between Twitter and news media was short-lived, dissipating after day 1. H1a and H2b are supported.

7.2 Discussion

Consistent with study 2, the high-influence group of Twitter has the most agenda setting power on news media. However, there is a reciprocal pattern of linkage between traditional and social media on the KKK issue agenda: news media influenced the agenda of Twitter users with low connectivity. For active information seekers, news media and Twitter mutually influenced one another, while the agenda of Twitter users with low connectivity was determined by news media. The reciprocal inter-media agenda setting effects between Twitter and news media occurred between different levels of influence groups and news media in a short period of time, indicating that Twitter offers a collaborative public space for the processing of information where both media organizations and citizens compete for the attention in a near real-time.

CHAPTER EIGHT

CONCLUSION

Social media have become an essential part of day-to-day communication, adding to the spaces allowing political marketing, political participation, mobilization, opinion formation, and agenda setting. The general public has been empowered with more choices in news content and direct channels to speak to the press. More importantly, the non-professional journalists are found to participate in news production and distribution beyond the scope of traditional news media through political blogs and social media (Bruns, 2005; Veil et al., 2011). As user-generated content increasingly plays an important role in the news, there has been considerable investigation and controversy about whether social media have agenda setting effects on traditional news media. Although several studies have examined inter-media agenda setting effects between social media and news media, scholars have paid little attention to the user dynamics in social media and their roles as an agenda setter. As discussed in the literature, previous studies on the agenda setting effects treated social media as a single homogenous entity reflecting public opinion and compared it with the news agenda although media organizations and politicians continue to have a strong social media presence. Acknowledging the user diversity, the current study aims to understand how social media influence the news media agenda and how political and media elites and citizens interact in the decentralized and interactive social media sphere during a heightened political period when both journalists and citizens have access to political events and information sources.

The primary finding of this dissertation is the demonstration of evidence that the Twitter agenda reflects both the agendas of citizens and news media. During the 2016 US Primaries, Twitter generally had agenda setting effects on news media. When the connectivity was considered, however, the high-influence group by in-degree shaped the media agenda. In other words, accounts with the most followers tend to control the information flow between news media and Twitter. Media organizations predominantly were in the high-influence group and approximately 10% of the citizens belonged to the high-influence group. While the results demonstrated that social media play a critical role in setting the agenda, traditional media are yet highly influential within the Twitter network. According to Schultz et al. (2011), people are more likely to share news from online newspapers than social media because they perceive traditional sources as more credible. The distribution of newspaper content through social networking sites has become a common practice and contemporary audiences who are cross-platform consumers turn to traditional news for information as the expertise and authority of news is located in the institution (Albarran, 2010; Tandoc Jr.,2019). Moreover, Twitter is more applicable to news consumption compared to other social media sites, enhancing news media's influence in Twitter (Chyi & Chandha, 2012). Therefore, it appears that social media are mechanically causing traditional media issue attention.

The current study also found reciprocal inter-media agenda setting effects between Twitter and news media, as opposed to one-way agenda setting. Much of recent studies found bidirectional relationships, especially between blogs and newspapers (e.g., Groshek & Groshek, 2013; Meraz, 2010; Russell Neuman et al., 2014). A mutual influence was prominent, particularly on political issues. Russell Neuman et al (2014)

argued that the relationship between the political discussion in news media and social media is better characterized as an interaction involving different resonance as each in its own way responds to the events of the day rather than a mechanical causal linkage. In this study, reciprocity occurred on one issue between different levels of influence groups and news media. The high-influence group with a large number of followers Granger caused the media agenda and the media agenda, in contrast, Granger caused the agenda of Twitter users who are active information seekers.

The second finding of this study is that although offline authorities continue to have a high influence on Twitter, ordinary citizens, including those who have limited influence in the offline world, participate in the agenda setting process by producing a high volume of tweets on social media. Since the number of citizens on Twitter is overwhelmingly greater than any other type of user, the high-influence group mainly consists of citizens. The repetition of events is often found and it resembles the tendency of media to repeat breaking news, which was afforded by the platform (Papacharissi & Oliveria, 2012). Zubiaga et al. (2013) suggested that the high volume of messages indicates conversationality in which people participate in the stream of co-creating a story about the event. Information sharing through the retweeting function of Twitter enables the prominence of an issue, disrupting the traditional one-way gatekeeping flows. The easiness of spreading prominent and popular tweets to a large number of users in very little time enables a certain issue to become salient. For instance, the current study found the popularity of news aggregator accounts that endorse and reproduce news. Thus, the ordinary citizens influence the media agenda through collective arguments as opposed to news media that relies on institutional credibility.

Results indicate that citizens tend to have a high level of connectivity through following while media organizations are less likely to reach out to others but more likely to receive ties. On the Koch Brothers issue, the high-influence group by out-degree, mostly consisted of citizens, exerted inter-media agenda setting effects on news media. The out-degree measure represents users who are engaging in news-seeking activities and exchanging information with one another more frequently, these users are thus the most information-rich (Tyshchuck et al., 2012). They are exposed to a constant stream of information, news, and trends related to current reality as well as what others in a user's network are reading and consider important, which may make the structure of implied communities visible (Sarno, 2009). The current findings indicate that the discussion triggered by these information-rich communities is later picked up by the media, another way citizens can influence the media agenda.

Twitter networks can be inclusive of multiple publics and connect seemingly disparate actors in a political discussion (Maireder & Schwarzenegger, 2012). Consistently, the current study shows various types of user accounts, including citizens, bloggers, politicians, journalists, and media organizations collectively generating news information and competing for public attention. Among the overflowing information generated by the high-influence group, only some of the issues become salient enough to shape the agenda. There have been contradicting arguments on how the development of communication technologies will affect the media environment. Castells (1996) emphasized that media will not eliminate hierarchies to the extent that the new technologies could give more power to those who are already in a position to control information, and it is the traditional gatekeepers that will dominate resources. This

conforms with earlier ideas about the gateway functions of media organizations in mediating ideas between small groups seeking social change and the larger public for whom those messages should be relevant (McLeod & Hertog, 1999). On the other hand, some have asserted that new technologies have diminished the power of traditional organizations but provided individuals opportunities to connect and participate in political processes (Bennett & Segerberg, 2012; Bimber et al., 2012). In fact, the findings of this study support both sides of the argument. It is true that a limited number of politicians, elite news organizations, and celebrities are featured prominently on social media, however, they also compete with other Twitter users for public attention on equal terms (Bruns, 2012). Consequently, the agenda setting effects on Twitter depend on the users' ability to draw attention to an issue and further disseminate the messages.

Papacharissi (2015) refers to content produced on social media by networked users as affective news "collaboratively constructed out of the subjective experience, opinion, and emotion" (p. 27). Both citizens and professional journalists incorporate elements of emotion to adapt to the social media environment and increase audience engagement. Recent studies also show that emotionally-charged content is more likely to be shared by online users (e.g., Dafonte-Gomez, 2018; Dang-Xuan & Stieglitz, 2012). Papacharissi (2016) goes further to discuss affective public, a new landscape replacing the old public sphere, where networked users interact around the news. Consistently, the current study reveals that agenda emerged out of collaborations among journalists and citizens generated in an ambient and always-on news environment during the 2016 Primary Election. A high volume of affective news was created in reaction to news events, reflecting users' subjective experiences and interpretations of the events. In other

words, "news" created on social media is different from information published by journalists and news organizations, influencing both the public and the news media agenda.

One important question in agenda setting research is how long an issue will remain salient. In general, the time-lag selection is important in agenda setting because it demonstrates the time-varying causal effects (Roberts et al., 2002). Chaffee (1972) asserted that a time lag that is too short will not capture the causal relationship but a time lag that is too long is also problematic because the causal effect will dissipate over time. Salwen (1988) also contended that time discrepancies in the measurement of public opinion are critical as they may affect the public's evaluation of issue salience. Past research shows that the optimal time lag varies depending on the issue and the medium (Brosius & Kepplinger, 1990; Wanta & Hu, 1994). Wanta and Hu (1994) found that television coverage had a shorter optimal time lag in agenda setting effects compared to newspapers. Winter and McCombs (1981) reported that it takes 2 to 6 months for changes in the media agenda to be fully translated to the public agenda. Shoemaker et al. (1989) argued that coverage that recurs in emphasis on a 3- or 4-month schedule may have the most influence on public opinion. More recently, studies on agenda setting effects concerning online issue salience show much shorter time lags, commonly applying 1 to 7 days time lag (Russell Neuman et al., 2014). Early studies examining agenda setting effects on online discussion boards, for instance, found that the lag between traditional news and online discussion boards varied from 1 to 7 days, with day 7 producing the most effects. In the present study, almost-immediate agenda setting effects with time lag varying from 1 to 3 days were observed. The short time lag

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demonstrates Twitter's immediacy of information distribution and the short life span of attention on issues during the election.

8.1 Significance of Research

This study makes contributions to advancing the agenda-setting theory by exploring user dynamics on Twitter and examining their agenda setting effects on news media. Twitter provides the opportunity to perform an analysis covering both citizens and news media. However, recent studies failed to consider the strong presence of journalists and news media organizations on social media in assessing agenda setting effects. In contrast with most existing studies on inter-media agenda setting, this dissertation disentangled different Twitter publics and users, revealing that traditional agenda setters, such as media organizations and political elites, continue to have a strong influence in the agenda setting process. Thus, the consideration of social media's user dynamics is required to study inter-media agenda setting correctly. It is also inappropriate to equate social media with public opinion treating it as a homogenous entity, not only because social media users are not demographically representative but also because it overshadows the impact of institutionally powerful actors. In addition, the correlation between the aggregation of news stories and Twitter messages simply reveals media content traveling across media boundaries, not agenda setting effects. The current study approached the agenda-setting effects of social media from a different perspective, recognizing different types of users to clarify the direction of agenda setting dynamics.

In order to identify the agenda setters, this dissertation categorized and identified Twitter users. Prior studies used varying categories depending on the purpose of the research although most of them only included highly connected users or a sample of users

in their analysis. For instance, Maieder et al. (2015) focused on the top 400 influential users and Sung and Hwang (2014) used 20% of the collected tweets. One of the goals of this study was to examine whether the ordinary citizens set the agenda through social media, thus attention was expended to the entire Twitter messages and users who participated in the agenda setting process. Additionally, all of the user profiles were manually coded for accuracy and consistency. As a result, the current study provides new insights into the role citizens play in the agenda setting, demonstrating that citizens affect the media agenda in a unique way – collaboration, collectivity, and connectivity.

The development of new media, social media, in particular, was generally considered a positive development for democracy, providing tools and spaces for equal deliberation among citizens, politicians, and interest groups (Diamond & Plattner, 2010). Social media give a voice to previously marginalized groups, creating new opportunities for participation and fostering citizen journalism (Price, 2013). However, scholars also recognized that social media are not inherently democratic, and that the impact of new technologies varies depending on contexts (Mitchell et al., 2019). For example, social media can be used to spread extremist ideas and fake news, increasing political misconceptions and polarization (Zhuravskaya et al., 2020). Mou et al. (2011) concluded whether the new technologies promote democracy is not up to the technology itself but contextual factors, such as the political system and beliefs.

The current dissertation demonstrated that traditional media's agenda setting power is no longer universal or singular within the current media environment. Social media are redistributing power and traditional media's agenda setting effect is now one force among many competing influences. Such inversion of elite control over the agenda

indicates that social media do support democracy, especially deliberative democracy. According to democratic theorists, a well-functioning democracy is reliant on two citizen actions: deliberation and participation (e.g., Habermas, 1962; Jamieson & Birdsell, 1990). An increasing number of people are turning to online sources to participate, gain political knowledge, and discuss politics, ultimately influencing the traditional media agenda. However, the current study also reveals that although traditional media's agenda setting power is no longer the sole influence, it still remains the most influential. Therefore, elites are disproportionately empowered by these processes, which has negative consequences for the legitimacy of democratic systems (Dryzek, 1989, p. 100). As Warren points out (1992), the core of democracy is the idea that citizens form opinions and develop political competence through communication. Despite some drawbacks, social media enable citizens to compete in the agenda setting process, produce knowledge, and develop political competence. Considering that the influence over the political agenda is one of the most important sources of power (Bachrach & Baratz, 1962), the current study reveals the democratic potential of social media.

In addition to the theoretical contribution to the agenda setting theory, the current study makes a methodological contribution to agenda setting studies using big data combined with traditional manual coding. The growth of social network sites has provided an ocean of data that reflects new media activities and artifacts massive in size: tweets, status updates, images, social recommendations, and more. Much of this information being freely available, this development has created new opportunities for computational approaches to social science research, known as "big data" (Lazer et al., 2009). Big data research has been associated with the computational analysis of datasets,

including social network analysis, automated data aggregation and mining, machine learning, and natural language processing (Parks, 2014). Although the use of big data allows scholars to explore novel means of analyzing media content, it also comes with challenges. First, even though Twitter users in the US increasingly reflect its online population, social media users are not demographically representative and thus, the generalizability and representativeness of the large datasets are open to questions (Brenner & Smith, 2013, Russell Neuman et al., 2014). Second, the challenges scholars often face provide strong evidence to question the validity of automated coding systems (Lewis et al., 2013). On the one hand, traditional forms of manual content analysis were not designed to handle huge datasets of media texts; on the other hand, the algorithmic analyses of content remain limited in their capacity to understand latent meanings or the subtleties of human languages (Conway, 2006; Simon, 2001). More importantly, Big data methodologies cannot substitute traditional and carefully designed surveys, experiments, and content analysis.

For this matter, Lewis and colleagues (2013) argued that computational methods are not always sufficient on their own, suggesting an approach blending computational and manual methods throughout the content analysis process. This approach can retain the strengths of traditional content analysis while maximizing the accuracy, efficiency, and large-scale capacity of the Big Data analysis. Similarly, the current study brings a new approach to understanding questions regarding the nature of agenda setting effects between social media and traditional media. In many cases, account users claim they are journalists but in fact, they are either citizen journalists or amateur journalists who are not affiliated with institutions, and thus oftentimes additional context was required to

distinguish citizen journalists from professional journalists. Because of this ambiguity, a

computational approach of automatic classifier for user types on Twitter using machine

learning likely would have yielded unsatisfactory results. On that account, datasets were

computationally collected and then were quantitatively and manually coded, focusing on

contextual features in addition to each account's profiles, such as past postings and

personal web pages linked to the profile page. While the amount of data available

discourages attempts at employing approaches based on manual coding, the current study

was able to identify that the user composition of the high-influence group who are most

likely to influence the media agenda is consistent across different issues. It also provides

a groundwork for future research interested in social media user classification.

8.2 Limitations and Suggestions

Although the present study demonstrated agenda setting effects of social media,

there are limitations that must be addressed. First, this study measures the number of

unique Twitter messages and news articles discussing an issue as an indicator of inter-

media agenda setting effects. Each issue agenda was defined using specific terms and

Twitter messages associated with the keywords were retrieved. Keywords were used

because Twitter messages using hashtags may slant the data toward more experienced

users (Jungherr, 2014). In the future, however, each issue agenda could be collected using

both keywords and hashtags for more complete data sets.

Second, the time frame chosen for the content analysis may be too short to detect

the long-term effects of social media on the news agenda. A longitudinal study design

would be helpful for observing the long-term impact of social media. This study

performed a Granger-causality analysis to examine the causal relationships between

social media and traditional news media. Although it is commonly used in agenda setting research, scholars agree that 'Granger causality' is not real causality (Seth, 2007). Moreover, Granger causality can show that the change in the volume of one trend preceded the change of values of another, but cannot show to what extent other events outside the model precipitated both sets of values (Russell Neuman et al., 2014). Therefore, one should be cautious in interpreting the results since there may be other causes that explain the identified relationship (Kushin, 2010).

Third, the data were collected during the primary election, a heightened political period when political issues are especially salient. In addition, many of the news sources during this period were Twitter messages and campaign rallies which were easily accessible. Thus, the results of this study may be unique to elections and cannot be generalized. Meraz (2011) argued that the ability to distribute messages on social media platforms becomes significant during times of conflict, and that individuals are able to change the dynamics of conflict coverage by the media. Furthermore, social issues are the most talked about issues on social media, such as drugs, same-sex marriage, and guns, but are less likely to address economic issues (Russell Neuman et al., 2014). Although issue agendas selected for this study are peculiar to the 2016 primaries, all of them fall under social issues. Such active political events may have reinforced the impact of social media on news agenda as many people turn to social media to express their opinions. In addition, social issues were selected for the current study because both citizens and journalists have access to the information sources, enabling the current study to examine the agenda setting competition between media elites and citizen journalists. Therefore,

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one should be cautious when generalizing this temporal correlation to other issues, such as economic and international affairs, or time periods.

It is important to keep in mind that Twitter does not represent social media platforms in general. It is an appropriate choice on substantive grounds in some cases, but it may not be the case in other events. As digital venues proliferate, it will become increasingly important to analyze more than one platform as there are many alternative social media websites competing with or replacing Twitter, especially among younger generations. Moreover, usage of social media platforms varies by age. For example, approximately 42% of US adults aged 18-29 use Twitter but only 7% of US adults aged 65 and over are Twitter users (Auxier & Anderson, 2021). In this regard, future research may expand the study to include more diverse social media platforms to test the inter-media agenda setting effects between social media and news media.

While the transfer of salience from the media agenda to the public agenda is the key step in the formation of public opinion, the magnitude of agenda setting effects is moderated by a variety of individual differences. One of the moderators is the individual's cognitive involvement with an issue, specifically each individual's perception of the issue's relevance (McCombs & Lee, 2013; McCombs & Stroud, 2014; Price & Tewksbury, 1997). The relevance hypothesis states that people will decide whether to use information media provided to make political judgments only when the information seems to be relevant (Miller, 2007). In particular, issue salience is influenced by emotional reactions a news story arouses, moderating agenda setting effects (McCombs, 1999; Miller, 2007; Sheafer, 2007). Given the controversial nature of political discourse, politically relevant social-media content is expected to exhibit a high

level of sentiment, especially in times of elections (Conover et al. 2011). Thus, future research may examine how emotional responses and the sentiment of the messages influence the agenda setting effects of social media on traditional news media.

8.3 Conclusion

As Schmierbach et al. (2022) pointed out, platforms change the agenda setting process as the contemporary agendas are "stitched" across different media platforms and networked publics. In the current media environment, agenda control is a key ingredient of power (McCombs, 2014). The current dissertation demonstrates that social media created a new public sphere where users assemble and co-create news while competing for attention and control over information flows. Social media is not a homogenous entity but rather a melting pot of various users with varying levels of influence within their networks. While the Twitter agenda reflects both the citizens and news media, inter-media agenda setting effects were found between social media and news. Overall, social media have a greater influence on news media's agenda and it is now clear that journalists and media organizations are not the only agenda setters. Although new media communication technologies have not yet eliminated hierarchies, users who are highly connected and effective in information production and diffusion play an important role in setting the agenda.

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TABLES

Table 1.1 Granger Causality Test between Twitter and News Media on Abortion

Time Lag	Twitter to Media	Media to Twitter
1	3.94$^{\#}$	.03
2	.32	.08
3	.40	2.45
4	.73	.84
5	1.76	1.03
6	.81	1.28
7	1.26	1.66

Note. # *p*=.058; **p<0.05; **p<.01*

Table 2.1 Koch Brothers User categories

User Categories	Frequencies
Politicians	.15% ($n = 4$)
Citizens	69.7% ($n = 1847$)
Journalists	1.8% ($n = 48$)
Media Companies	.6% ($n = 16$)
Non-media Companies	1.5%($n = 40$)
Interest Groups	1.4% ($n = 39$)
Political Parties	0% ($n = 0$)
News Aggregators	3.06%($n = 81$)
Celebrities	.03% ($n = 1$)
News Blogs	.8% ($n = 21$)

Table 2.2 Koch Brothers Top 10 Influential Users

	In-degree Centrality	User Categories	Out-degree Centrality	User Categories
1	1	Media Company	1	Citizen
2	0.792075628	Media Company	0.303565525	Citizen
3	0.521155817	Media Company	0.207998544	Citizen
4	0.520964125	Media Company	0.207928781	Citizen
5	0.382920928	Media Company	0.205302031	News Aggregator
6	0.116343701	Citizen	0.161878763	Citizen
7	0.116157833	Citizen	0.144692661	Citizen
8	0.110717766	News Aggregator	0.136299801	Media Company
9	0.106213624	Citizen	0.123530036	Citizen
10	0.091102832	Citizen	0.119213795	Citizen

Table 2.3 User Dynamics on Koch Brothers

User Categories	Frequencies
Citizens	69.7%
News aggregators	3.06%
Journalists	1.8%
Non-media companies	1.5%
Interest groups	1.4%
News blogs	.8%
Media companies	.6%
Politicians	.15%
Celebrities	.03%
Political parties	0%

Table 2.4 Koch Brothers Granger Causality test between Twitter and News Media

Time Lag	Twitter to Media	Media to Twitter
1	.486	.01
2	14.276***	.10
3	11.38***	1.01
4	7.20**	.23
5	1.58	.45
6	1.87	1.030.
7	1.23	.62

*p<0.05; **p<.01; ***p<.001

Table 2.5 Koch Brothers Granger Causality Test (In-degree) – Twitter to News

Time Lag	Low In-degree	Medium In-degree	High In-degree
1	0.13	0.53	0.70
2	.1648	4.78*	6.20**
3	.1801	2.60	4.32*
4	1.4559	.28	.09
5	.9358	.63	.44
6	2.933	.70	.69
7	2.1606	1.2918	.5822

*$p<0.05$; **$p<.01$; ***$p<.001$

Table 2.6 Koch Brothers Granger Causality Test (Out-degree) – Twitter to News

Time Lag	Low Out-degree	Medium Out-degree	High Out-degree
1	.38	.73	.94
2	1.2529	6.3346**	8.3068**
3	.8136	3.845*	3.845*
4	.2156	.126	.126
5	.8634	.5541	.5541
6	.7771	.9284	.9284
7	.16656	.802	.802

*$p<0.05$; **$p<.01$; ***$p<.001$

Table 3.1 KKK User Categories

User Categories	Frequencies
Politicians	0% ($n = 11$)
Citizens	97.5% ($n = 24,930$)
Journalists	.6% ($n = 160$)
Media Companies	.2% ($n = 40$)
Non-media Companies	.3% ($n = 88$)
Interest Groups	.2% ($n = 52$)
Political Parties	0% ($n = 1$)
News Aggregators	.5% ($n = 119$)
Celebrities	.1% ($n = 17$)
News Blogs	.4% ($n = 107$)

Table 3.2 KKK Top 10 influential users

	In-degree Centrality	User Categories	Out-degree Centrality	User Categories
1	1	Media Company	1	Citizen
2	0.792075628	Media Company	0.303565525	Citizen
3	0.521155817	Celebrity	0.207998544	Citizen
4	0.520964125	Celebrity	0.207928781	Interest Group
5	0.382920928	Celebrity	0.205302031	Citizen
6	0.116343701	Media Company	0.161878763	Citizen
7	0.116157833	Citizen	0.144692661	Citizen
8	0.110717766	News Aggregator	0.136299801	Citizen
9	0.106213624	Media Company	0.123530036	Citizen
10	0.091102832	Media Company	0.119213795	Citizen

Table 3.3 User Dynamics on KKK

User Categories	Frequencies
Citizens	97.5%
News aggregators	.6%
Journalists	.5%
Non-media companies	.4%
Interest groups	.3%
News blogs	.2%
Media companies	.2%
Politicians	.1%
Celebrities	0%
Political parties	0%

Table 3.4 KKK Granger Causality Test between Twitter and News Media

Time Lag	Twitter to Media	Media to Twitter
1	5.14*	.18
2	1.43	.11
3	1.69	.81
4	1.12	.52
5	.69	.63
6	.82	.49
7	1.02	1.43

* *p*<.05

Table 3.5 KKK Granger Causality Test (In-degree) – Twitter to News

Time Lag	Low In-degree to News	Medium In-degree to News	High In-degree to News
1	.65	3.34$^{\#}$	11.97**
2	.63	.72	1.06
3	.91	.94	1.4
4	.85	.59	.79
5	.06	.16	.27
6	.35	.59	1.03
7	1.08	2.59	.39

Note. # *p*=.08; **p<0.05; **p<.01*

Table 3.6 KKK Granger Causality Test (Out-degree) – Twitter to News

Time Lag	Low Out-degree to News	Medium Out-degree to News	High Out-degree to News
1	.05	2.78	10.28**
2	.75	.70	.85
3	.76	.97	1.37
4	.72	.58	.73
5	.06	.13	.42
6	.03	.52	3.30
7	.06	.45	1.16

*p<0.05; **p<.01

Table 3.7 Koch Brothers Granger Causality Test – News to Twitter

Time Lag	News to Low Out-degree	News to Medium Out-degree	News to High Out-degree
1	1.83	.03	4.82*
2	.11	.03	1.11
3	1.69	.77	0.79
4	1.19	.63	0.66
5	2.47	1.63	1.71
6	2.18	1.60	1.06
7	22.37*	1.46	1.71

*$p<0.05$

FIGURES

Figure 1.1 Daily amount of coverage on Abortion and Trump
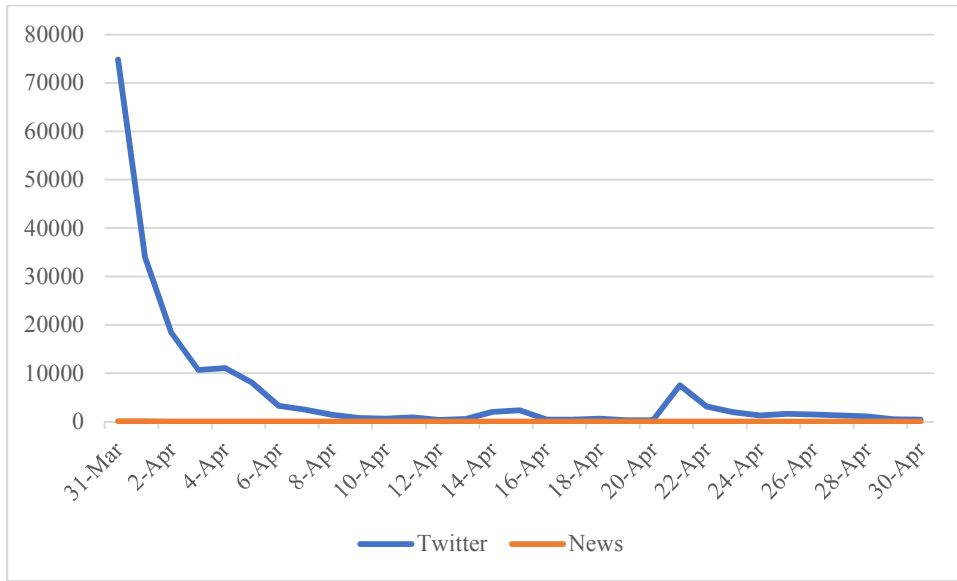
Figure 2.1 Daily amount of coverage on Koch Brothers
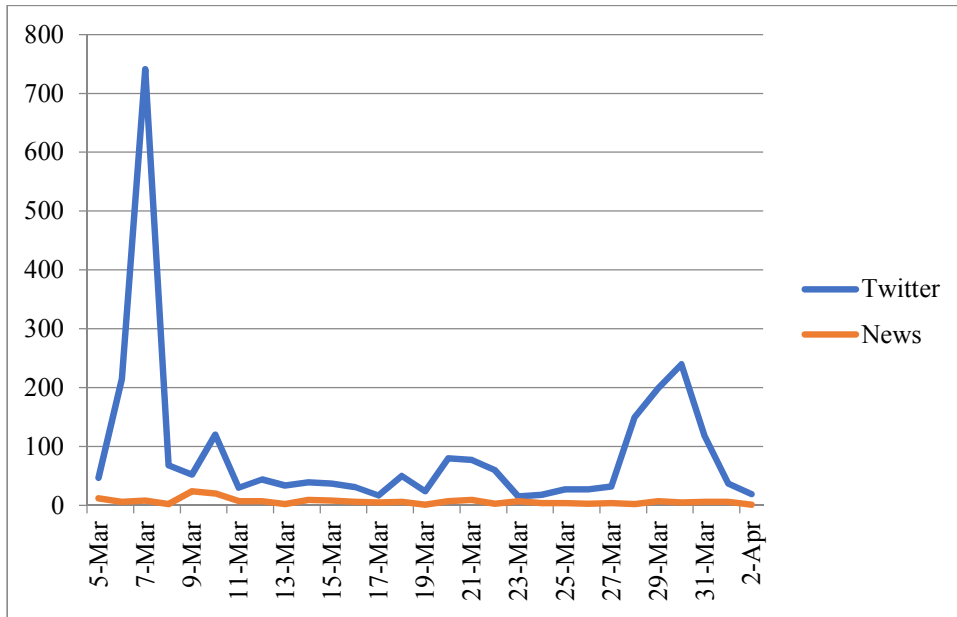
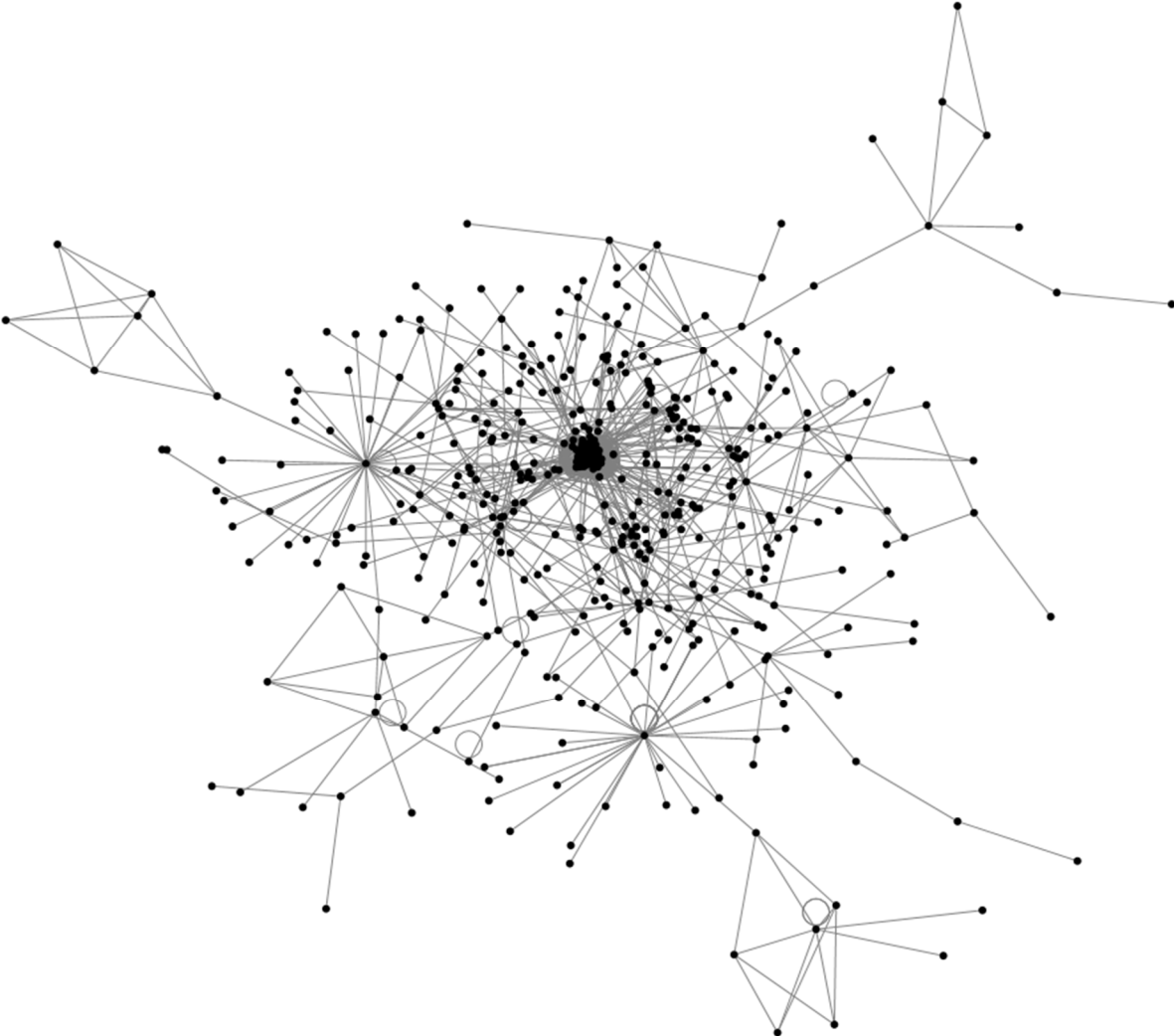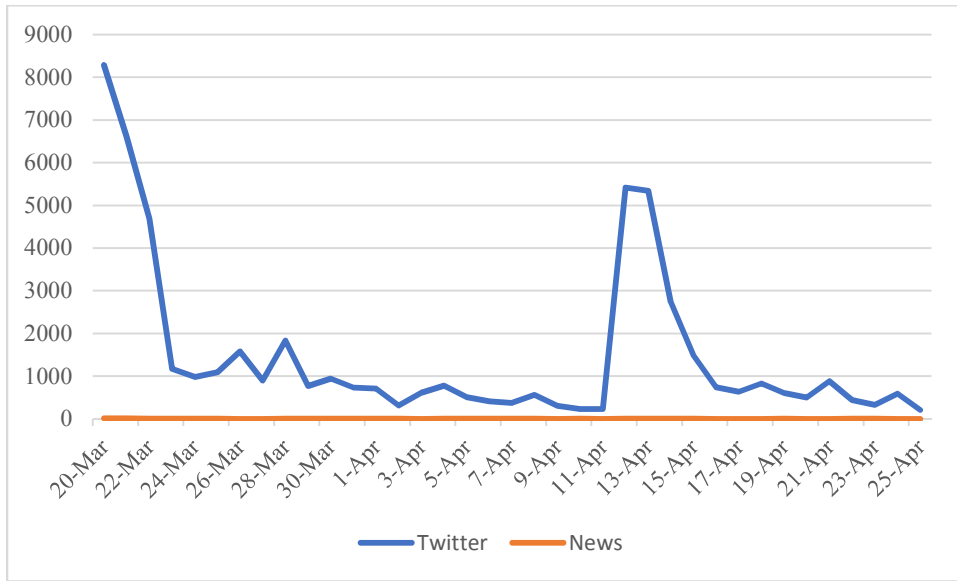**Figure 2.2 Twitter Network on Koch Brothers**

Figure 3. Daily amount of coverage on Ku Klux Klan and Trump

Figure 3.2 Twitter Network on KuKluxKlan