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An Assessment of Extremist Groups Use of Web Forums, Social Media, and Technology to
Enculturate and Radicalize Individuals to Violence

FINAL SUMMARY OVERVIEW

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PURPOSE

Over the last two decades, the quantity and quality of research associated with terrorism has increased dramatically (Freilich et al., 2014; Hamm, 2007; LaFree & Bersani 2014; LaFree et al., 2018). There is particular focus on far-right extremist groups and movements, as they are largely recognized as a key threat to American public safety (Freilich et al., 2014; Freilich, Chermak, & Simone, 2009). Many of these studies apply criminological theories to assess factors associated with radicalization and ideologically motivated violence (Bakker, 2006; Borum, 2011; Hamm, 2007; Krueger, 2007; McCauley & Moskalenko, 2011; Monahan, 2011; Sageman, 2004; Simi & Futrell, 2010; Stern, 2003). Additionally, a portion of these studies consider the role of technology in the radicalization process (Hamm, 2017). There is, however, less research considering the basic use of technology among ideologically motivated groups (Frank, Bouchard, Davies, & Mei, 2015; Holt & Bolden, 2014; Weimann, 2011). There is also minimal systematic research examining how ideology is expressed in online spaces (Hamm, 2017; Weimann, 2011). Lastly, there is generally exploratory and case studies considering the structure of ideological group networks (Azad & Gupta, 2011; Bouchard & Nash, 2015; Perliger & Pedahzur, 2011), making it difficult to assess how these structures may operate in online spaces.

To address these issues and improve the state of knowledge related to far right extremist groups, this project investigated five key questions related to technology and its influence on ideological expression in online spaces:

(1) Examine the nature of ideological expression through a range of forums operating on various web forums associated with far right movements and real world extremist groups generally.

(2) Identify the ways that communicating these messages may change over time as a function of participants in extremist communities.

(3) Quantify the self-disclosure of technology use, communication of computer security principals, and diffusion of information and ideology to determine patterns of technology use and variations in technological sophistication within and across extremist communities.

(4) Explore the structure of social networks based on participation in web forums within extremist movements generally.

(5) Investigate if the nature of communication in online environments changes (in terms of the volume of posts, or the posts' specific content) immediately prior and/or after violent acts are committed by these extremist movements.

The study's goals, in sum, are to better understand the utility of computer-mediated communication in the promotion of ideological messages, enculturation, and radicalization to violence in far-right extremist communities online. It is vital that research identify any differences in the way that such groups use asynchronous forms of communication to promote their agendas, radicalize members, and encourage violent and terrorist acts.

PROJECT DESIGN AND METHODS

This study collected data from eight total forums active in ideological groups arrayed along the so-called "far right" which includes a range of ideological beliefs. This study's data are based on a set of 18,120 posts derived from seven web forums operating on-line by and for individuals with an interest in the ideological Far Right both in the United States and other nations. Web forums are a form of computer mediated communication that allow individuals to connect and discuss their resources and needs (Chermak et al., 2013; Holt, 2010; Mann & Sutton, 1998; Weimann, 2011). Forums are composed of threads, which begin when an individual creates a post where they ask a question, give an opinion, share news, or simply describe their past experiences. Others respond to the initial post with posts of their own to create a thread that running conversation or dialogue. Thus, threads are composed of posts that centre on a specific topic under a forum's general heading. Since posters respond to other users, the exchanges present in the threads of a forum may "resemble a kind of marathon focused discussion group" (Mann & Sutton 1998: 210).

We selected the forums based on their population size and ties to real world groups. Forums with both large and small user populations were identified to represent the range of forums currently operating on-line (Holt, 2007; Holt, Smirnova & Chua, 2016). Similarly, forums that were explicitly linked to a real world group were selected as were ideologically expressive, but non-affiliated sites. Five forums were identified whose names were the same as prominent national or international groups that have physical meetings off-line, and stated they were operated by these off-line groups. Two forums were also identified that had no specific group link but whose names or keywords were linked to far-right ideologies. Choosing these sites allowed us to compare the presence or absence of expression of ideological ideas on the basis of ties to a real world group (see Table 1 for forum information breakdowns).

We also gathered threads from various subforums within each forum site. Subforums are specialized sections within a given forum that focus on a specific topic of interest, such as humour, technology, or science, depending on the overall focus of the forum (e.g. Holt, 2010). This study specifically oversampled on subforums related to technology, gender, or general interest content so as to understand the extent to which technology is discussed as well as the nature of ideological expression in posts that may not have a direct link to an ideological agenda.

To create the data sets, all threads from each subforum selected were saved as html files for analysis. The content of each post was then read and coded by hand for either quantitative or qualitative analyses depending on the nature of the project objective. The specific methods employed are elaborated within each objective's subsection. When quotes are provided, they are taken directly from the content of posts with all spelling and grammar intact. The usernames have been changed to provide a modicum of anonymity for the users (Holt, 2007; Silverman, 2011).

Table 1: Descriptive Statistics for Forum Sample

Forum	Group Affiliated	# of Users	# of Threads	# of Posts	Years of Posts Covered
1	Yes	293	131	936	2008-2015
2	Yes	926	1454	10192	2008-2016
3	Yes	443	303	1947	2005-2015
4	No	45	130	1378	2010-2015
5	Yes	250	906	6544	2010-2015
6	Yes	829	1331	6113	2001-2015
7	No	65	103	297	2011-2015
Total		2851	4,358	27497	

DATA ANALYSES

Objective 1: Expression of Ideological Belief

Data for this analysis was based on a subset of 16,549 posts derived from seven web forums operating on-line by and for individuals with an interest in the ideological Far Right both in the United States and other nations (see Table 2). The content of each post was then read and coded by hand to determine the extent to which ideological messaging was present in each post. The unit of analysis for this study is the content of each post, not the posters so as to count the relationships between content, rather than their evolution over time.

The content in each post was coded using content analysis techniques to quantify the appearance of key terms, phrases, and imagery using the typology derived from Kerodoal, Freilich, and Chermak (2016). The original study utilized data from the U.S. Extremist Crime Database (ECDB), which provided data points on various aspects of the real world actions of far right extremists. Since this study was developed using online data, it precludes the use of certain variables. As a result, we had to modify certain concepts or code them in a way that more accurately assesses on-line behaviors compared to off-line activities.

Conspiratorial posts were coded (0=no, 1=yes) based on the use of comments that detail or reference a known far right conspiracy, such as ZOG or the one world government. Xenophobic posts (0=no, 1=yes) were coded when a post included racist or xenophobic language regarding an outgroup or immigrant group generally. Additionally, the content of each post was coded (0=no, 1=yes) for language targeting seven key ethnic or religious groups typically targeted by far right groups: 1) Anti LGBTQ; 2) Anti-Latino; 3) Anti-African American; 4) Anti-Immigrant; 5) Anti-Jewish; 6) Anti-Catholic; and 7) Anti-Islamic posts.

Anti-Government posts (0=no, 1=yes) were coded based on the poster's use of language that was oppositional to the US government, or attempts to delegitimize its rule. Anti-Tax posts (0=no, 1=yes) were identified when the user indicated they did not have to pay taxes or

referenced an association to sovereign citizen movement groups generally. Survivalist posts (0=no, 1=yes) were coded on the presence of comments related to an impending apocalypse or "prepper" mentality, such as the need to stockpile food, gold, or other materials for an upcoming catastrophe.

Table 2: Forum Descriptives for Ideological Analyses

Forum	Group Affiliated	# of Posts	Years Included
1	Yes	625	2008-2015
2	Yes	7,622	2008-2016
3	Yes	1,438	2005-2015
4	No	771	2010-2015
5	Yes	3,199	2010-2015
6	Yes	2,625	2001-2015
7	No	269	2011-2015
Total		16,549	

Anti-Gun Control posts (0=no, 1=yes) were coded on the basis of language suggesting that gun control laws are unnecessary, or impugn regulations imposed by the government. Posts involving participation in an event (0=no, 1=yes) were coded to assess any instance where a user suggests they were in attendance at a rally, protest, or other real world event associated with far right groups.

Additional variables measured unique online behaviors that are expressive of far right ideologies. First, posts were coded for the presence of Movement related signatures or imagery (0=no, 1=yes), such as the appearance of an Iron Cross or swastika image within their post. Additionally, if the user ended each post with a "signature line" evocative of far right beliefs, such as "1488" (e.g. Simi & Futrell, 2010), or quotes from Adolph Hitler. Individuals who made a specific claim within a post that they belonged to a named extremist, radical, or other far right group in the real world, were also noted (*self-claim*; 0=no, 1=yes). Lastly, the use of movement-related usernames were noted (0=no, 1=yes), such as the use a name reflecting adherence to ideological beliefs (Holt, 2010).

Within this sample, there were a relatively small proportion of posts related to conspiracy theories or conspiratorial notions as a whole. Only 3.15% of all posts (n=477) involved such language. There was a statistically significant difference in the presence of conspiratorial posts in those forums tied to a real group relative to those unaffiliated forums (x2=132.055***), with fewer posts in those not affiliated with a specific group (tau b=-.089***). Some of these posts were relatively common conspiracies, such as anti-vaccination ideas and anti-climate change sentiment. For instance, a poster complained that climate change science was completely fake, writing:

If you're looking for scientific proof that Climate Change is a hoax, look no further than the way in which these doomsday grifters [SIC] and profiteers live. This environmental movement is all about The Arrogant using a phony crisis as an excuse to push their Dark Age beliefs on the rest of us.

Others were more generic, simply referencing the notion of the Zionist Occupied Government (ZOG) as a whole. For example, there was a discussion in a thread from a group-affiliated forum about the potential that a related group had been infiltrated by law enforcement. The comments from users referenced ZOG several times o highlight their views of the government:

1488fan: woman+man against the evil Z.O.G war-machine.We have never abandoned the idea of leaderless resistance and no-one can call us traitors.

88toall: We are all in the movement. I believe that the hammers[skins- a violent far right group] grew to[o] quick and zog infrated [SIC- infiltrated is implied] easily. I dont know know Hammers but if I did I would fight right beside them and any other white groups.

Nordic: That's true, they did get infiltrated pretty bad over the years. But so has the Klan, C18, NF, BNP, *insert the name of your favourite [SIC] group here* - we all have at some point. ZOG sees us as a threat, particularly when we show solidarity.

There were a number of users who included xenophobic language in their posts. Almost 12 percent of all posts used such language, as in the following post where a user explained he became a National Socialist "at about 14 or 15, watching the way my town was slowly going down hill and immigrant workers forcing my dad out of work and schools teaching liberal leftist subjects." In another thread, a user commented on the perception of the white race's decline in the US writing:

we'll be the ones on the reservations someday. We're already being chased out of our urban communities by spics and niggers and taught that we must meekly defer to them in society, otherwise they'll get mad at us and have a right to be. Sickeningly, most Whites refuse to see it.

There were no statistically significant differences observed in the number of posts observed between posts appearing in group or non-group affiliated forums.

There were, however, a range of posts targeting specific groups with negative comments in keeping with general sentiments from Far Right groups (e.g. Bowman-Greive 2009; Kerodal et al., 2016). Anti-African American sentiment was the most frequently observed, appearing in 13.9% of all posts (n=2,302), followed by anti-Jewish sentiment (6.2%; n=1,029). Anti-Latino (2.2%; n=362), anti-immigrant (2%; n=327), anti-Islamic (2%; n=334) and anti-LGBTQ (1.6%; n=273) were far less common. Anti-Catholic sentiment was observed in only 24 total posts (0.1%). The nature of these comments ranged from ethnic slurs as noted above to more elaborate discussions of different groups. Some of these posts appeared in discussions of online gaming, as with the following comment about various video games targeting minorities:

Try [the video game] race to berlin, it has a German campain [SIC], unfortunatly [SIC] its Germany with no more nazi party as to not offend all the beaners niggers and jews. I don't get that part because beaners and niggers don't have the intelligence to use a computer and the jews aren't even human so it really dosn't [SIC] even matter. F***cking ACLU. I want a run the death camp game like Sims [a video game simulating human lives].

In addition, a thread was made to comment on airstrikes between Israel and Hamas, with posts showing clear distain for both Muslims and Jewish people alike:

Rahowa!: Its interesting how these foreign volunteer ISIS shitbags are allowed by Western governments to travel to fight in Syria, Iraq etc. If they were going to volunteer to fight Israel, that would be a very different story. They would be jailed before they left the country. Not really mentioned is the large number of kikes from around the world that travel is Israel to partake in it's war crimes. That is deliberately overlooked by Western governments.

BlackFlag: I agree with you but lets see it as a football match, who would you support the muslims or the jews , i would definitely support the muslims so as to crash them later with my team

Whitepride: Ehm no, I would never support muslims, and actually they are in no way worse than jews. The difference is, muslims do everything openly with their terrorists and bombs, while jews are destroying our countries secretly from inside. They both are equally bad and, as I said before, they should just kill each other.

There was a statistically significant difference observed in the presence of these comments between group affiliated and non-group affiliated forums, and all were more likely to appear in forums associated with a real world group.

Only 1.8 percent of all posts (n=294) involved anti-government sentiments, with no differences observed across forum types. Anti-governmental comments varied in terms of topic though they were all overwhelmingly negative. For instance, a poster from a general interest forum was making comments regarding the spread of illness as a direct function of illegal immigration and the placement of migrants across the US. He ended his comments stating: "Our government knows exactly WHERE the disease comes from and how it made it's way here!" In a related discussion of illegal immigration from 2014, a user wrote:

well you have to hand it to our "Home Land Security" [SIC] and the new head Jeh Johnson, he is doing all in his power to start the 2nd Civil War lmao [Laughing My Ass Off]. just a guess but I would say it should begin before the 2016 elections. Congress is doing all they can to secure our Borders also !!!!! lmao.

Other comments more overtly called for political action, as with a user describing mandatory vaccinations laws in California as a violation of privacy:

It seems the citizens of California need to storm the Capitol steps to demand the repeal of this law borne of greed and corruption immediately much the same as the citizens of Texas succeeded in getting Governor Rick Perry to eat crow and apologize publicly for his overreaching executive order requiring all girls to be vaccinated with Gardasil without exception.

Other comments were more generic, reflecting the notion that the US government was directly lying to the population as a whole. This was exemplified by a post from a user stating: "Government is ALWAYS Lying to you, just like the Devil does, some truth, to make you believe his BIG lie!"

Only 12 total posts (0.1% of all) commented on anti-tax ideas or sovereign citizen-related concepts. Similarly, survivalist comments were a very small proportion of the total (n=61; 0.3%) as were anti-gun control posts (n=52; 0.3%).   In fact, gun control posts appeared primarily in signature lines, with comments such as: "If you want to know what I think of guns, try breaking into my house and find out!" and "The dirty secret, the government wants your firearms!" No significant differences were observed between anti-tax and anti-gun control posts, though survivalist posts were more likely to appear in non-group affiliated forums (x2=8.845**; Tau b= -.023*).

There was some evidence of individuals indicating they participated in events taking place in real world spaces and meetings (1.7%; n=275). There was a statistically significant difference in the appearance of these claims between group and non-group affiliated forums (x2= 10.153***) with fewer claims appearing in group affiliated forums (tau b= 0.025**). Some of these comments were generic, suggesting a person was in a group, but not specifically identifying the city or state of its members, as with the following post: "I happen to know a lot about the Hammers[kins] and have experience with them over the last couple of decades - they're not all bad people. I've even had some of them back me & co. up in fights."

A similar number of self-claim posts were observed (2.2%; n=365). There was a statistically significant difference in the appearance of these claims between group and non-group affiliated forums (x2= 9.241**) with more claims appearing in group affiliated forums (tau b= 0.024***). Similar to the comments noted above, forum posts could be generic, as with the following quote from an individual indicating their role in national socialist groups stating: i became ns [National Socialist] at 15. my mentor [name removed] and my mother taught me well.my grandfather was KKK. it runs very deep in my family." Others were more specific as evident in a thread where an individual claimed to be a member of the KKK and wrote:

No matter what anyone thinks about Adolf Hitler or in what esteem they hold the man, he is NOT YHVH [Yahweh, or the name of god]. As he is not YHVH, we of the United Realms of America Knights of the Ku Klux Klan DO NOT follow him or his politics. This is not to say that he was a terrible man or that he didn't have good intentions, however we believe that only YHVH is to be followed and worshipped!

This post led to quite a bit of outrage, and a poster wrote; "As an officer of the Church of the National Knights of the Ku Klux Klan I most humbly apologize to all members for this retards behavior."

The majority of users expressed their ideological beliefs via a movement related signature or image (74.2%; n=12,116) or a username (n=43.6%; n=7,213). These range from the use of

1488 in signatures, which is more often formally written as 14/88, to more specific language such as "RAHOWA NOW." The use of 1488 in any guise reflects the Nazi beliefs, as the 88 reflects HH, or Heil Hitler, since H is the eighth letter of the alphabet. Similarly, the 14 in this structure means the 14 words of noted white nationalist and domestic terrorist David Lane: "We must secure the existence of our people and a future for white children."

Others used direct quotes from Hitler, such as "A man does not die for something which he himself does not believe in." This is sensible, as an individual's name or avatar (image) is the most immediate way to establish their online identity (Blevins & Holt, 2009; Holt, 2010). Selecting a name that is associated with white identity politics or the ideological agenda of a group enables the user to clearly demonstrate their connection to the broader subculture and movement (Holt, 2010). Additionally, using a signature line, image or username that evokes ideological sentiments ensures other forum users know your beliefs regardless of the content in your post. In fact, only 10.4% of all posts did not feature either an ideological signature or username, while 27.5% of all posts featured both.

Additionally, there was a significant difference in the appearance of signatures or images in a post based on whether a forum had tie to a real world group ($x2=50.598***$), with more movement-based material appearing in forums with no group affiliation (tau b=-.056***). Similarly, ideological usernames were significantly different between forum types ($x2=19.699***$), with more appearing in forums with no real world group ties (Tau b=-.035***).

To assess the extent to which individuals expressed ideological beliefs within a post, multiple scales were created using the binary measures discussed above. First, an eight-item scale was created to include ideological expression based on the framework provided by Kerodoal et al., (2016), including conspiratorial, xenophobic, anti-government, anti-tax, survivalist, anti-gun control, participation in real world events, and self-claim comments (see Table 3.1). The overwhelming majority (81.5%) of posts involved no ideologically expressive comments, with the second largest category being one type of comment (16.3%). An extremely small proportion of posts made two (1.9%) or three (0.2%) types of comments simultaneously; only seven posts featured four or more ideological comments at the same time. There was a statistically significant difference observed between forums on the basis of ties to real world groups ($x2=18.017**$), with fewer scaled responses observed in forums with no real world ties.

When adding in both ideologically expressive usernames and signatures or imagery to this scale, the results change substantially. There was much greater variation in the proportion of posts in this scale: only 4.2% of posts feature no ideological expressions (see Table 3.2). Instead, the primary response category becomes one ideological expression (59.6%) followed by two forms (30.8%). Additionally, three (4.7%) and four (0.6%) forms were more prevalent, and one post was observed with all nine items. There was a significant difference between the forum types, with a lower scaled response in non-group forums compared to those with a group tie ($x2=119.708***$; tau b=-.082***).

Table 3: Ideological Expression by Category

Scale	1 8 Item	2 10 Item	3 7 Item	4 15 Item
0	13,483 (81.5%)	679 (4.2%)	12,533 (75.7%)	11,110 (67.2%)
1	2,695 (16.3%)	9,732 (59.6%)	3,489 (21.1%)	3,455 (20.9%)
2	321 (1.9%)	5,026 (30.8%)	433 (2.6%)	1,444 (8.7%)
3	37 (0.2%)	764 (4.7%)	75 (0.5%)	394 (2.4%)
4	5 (0.0%)	104 (0.6%)	13 (0.1%)	103 (0.6%)
5	1 (0.0%)	9 (0.1%)	2 (0.0%)	24 (0.1%)
6	0 (0.0%)	3 (0.0%)	1 (0.0%)	9 (0.1%)
7	1 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
8	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
9	0 (0.0%)	1 (0.0%)	0 (0.0%)	1 (0.0%)
Total	16,543 (100%)	16,318 (100%)	16,546 (100%)	16,540 (100)

To examine the expression of comments against minority groups, a seven item additive scale was created by combining the binary measures for anti-LGBTQ, African American, Latino, Immigrants, Jewish, Catholic, and Islamic sentiments (see Table 3.3). The findings suggest there was some variation in the extent to which individuals overtly and simultaneously targeted different groups. The majority of posts featured no such comments (75.7%), or one comment (21.1%). A small proportion featured comments against two (2.6%) to four groups (0.1%). Only one post featured comments against six groups at the same time. There were more posts in group affiliated forums compared to those with no group ties ($x2=187.304***$; tau b=.104***)

Finally, a 15 item additive scale was created by combining the scales presented in Tables 3.1 and 3.3 together to reflect the original scale created by Kerodola et al., (2016) as well as negative sentiments toward specific minority groups (see Table 3.4). The majority of posts involved no ideological content in text (67.2%), though there was a greater proportion of posts featuring at least one form of ideological messaging than the original scale (20.9%). Additionally, there was a substantive increase in those posts featuring two (8.7%) or three ideological ideas (2.4%). Only one post featured nine ideas simultaneously, and no post featured more than nine expressive concepts. There were fewer ideological posts in non-group affiliated forums compared to those with group ties ($x2=45.832***$; tau b=.045***).

Given the substantial proportion of posts featuring ideologically expressive usernames and signatures or imagery, t-tests were conducted to examine any relationship between these measures and the content of posts. Those posts including both a signature or image and an ideological username were more likely to express ideological sentiments using the first scale compared to those with either a username (mean diff=.052; sig=.000) or signature or image (mean diff=.228; sig=.000). The same relationship was present regarding sentiments toward minority groups (username=mean diff=.052; sig=.000; signature=mean diff=.576; sig=.000), suggesting those posts with more overt associations to a radical movement would involve more ideological content.

Objective 2: Social Influence of Ideological Expression through Online Community Participation

To consider the role of online community participation on the potential for increased ideological expression, Repeated measures analysis of variance (RM-ANOVA) and social network analysis were used (Conway, 2017). RM-ANOVA is highly suitable for addressing this question because it measures within-subject changes, especially when multiple measurements on one specific variable were taken from the same group of subjects (Howell, 2004; Lix & Keselman, 2010). Since ideological beliefs were aggregated by year, results from the RM-ANOVA would determine if there is any significant change in the mean level of ideological beliefs between time points for each forum.

For this study, the model of influence is utilized as the research question pertains to the effects of interactions on attitudinal changes in online far-right forums. The social influence model is highly suitable for three reasons. First, the model of influence allows researchers to examine the impact of participation in online far-right extremis forums on radicalization process. Second, influence models are consistently employed by scholars from various fields to examine the effects of social networks on behaviors and attitudes (Frank, Zhao, & Borman, 2004).

Third, social influence models allows researchers to address the theoretical concepts of Akers' (2009) social learning theory (SLT) which posits that any behavior, including criminal behavior, is learned. SLT has been used to assess myriad forms of deviance and crime and is highly supported through empirical research (Akers, 2009). This theory argues that differential associations with criminal or deviant others provides individuals with definitions supportive of crime, as well as sources of imitation for behavior. In turn, individuals may engage in deviance and crime as a result of these exposures, and may continue to offend depending upon the extent to which they experience positive or negative reinforcements for their actions (Akers, 2009)

In this respect, participation in a forum provides virtual engagements with others. They provide models for behavior and expose participants to differential definitions that may support radicalization and acceptance of ideological beliefs. This allows researchers to capture the number of interactions between user pairs and determine if and how active interactions with users in online extremist web forums affects one's far-right ideological beliefs. Furthermore, this technique is highly compatible with the proposed mechanism of behavior and attitude change through the accumulation of information and ideas (Frank & Fahrbach, 1999). Lastly, the use of SLT may be a preferable framework to operationalize potential radicalization and ideological messaging change compared to traditional frameworks of radicalization which do not provide consistent or necessarily clear operationalization of concepts.

The analytic strategy employed analyzed the within- and full-forum datasets using the social influence model. Given the heterogeneity of far-right ideologies (Bowman-Grieve, 2009; Gerstenfeld, Grant, & Chiang, 2003; Michael, 2003), multiple variable structures were used to analyze each forum. Since the social influence model measures changes in attitudes and/or behaviors over time (Frank & Fahrbach, 1999; Frank et al., 2004), it was necessary to run the social influence model for each established time point within the forum.

The model for all within-forum analyses can be represented as a multivariate regression model:

$$EI_{it} = \rho \sum_{i'=1}^{n} DA_{ii'_{t-1 \to t}} EI_{i'_{t-1}} \times RK_{i'_{t-1}} + \gamma_1 DR_{i_{t-1}} + \gamma_2 IM_{i_{t-1}} + \gamma_3 PT_{i_{t-1}} + \gamma_4 EI_{i_{t-1}}$$
$$+ \gamma_5 TS_{i_{t-1}} + \gamma_6 SC_{i_{t-1}} + \gamma_7 NE_{i_{t-1}}$$

The first variable in the equation ($\sum_{i'=1}^{n} DA_{ii'_{t-1 \to t}} EI_{i'_{t-1}} \times RK_{i'_{t-1}}$) is the network term unique to the social influence model. This model aims to identify factors that contribute to the attitudes of user i at time t. The variables will be discussed in the following section.

A total of 46 within-forum models were conducted. The number of models were lower than the total number of time frames due to two issues. First, there was an absence of data in two forums. In Forum 1, there were no data from 2012, making it impossible to predict users' attitudes for 2013. Instead, data from 2011 was used. In Forum 6, there were no social interactions associated with posts in 2001 and no data from 2002. As a result, the multivariate regression model was not performed for those two years. Second, there were lack of variations in users' attitudes in 2008 for Forum 1 and Forum 2.

Variables from the 46 models were then compiled to create an all-forum data file and the social influence model was performed using this file. To understand the level of biases needed to have occurred to invalidate findings in the full-forum mode, sensitivity analyses were conducted (Frank, Maroulis, Duong, & Kelcey, 2013). This is expressed as the percentages or numbers of cases from the sample that needed to be replaced to invalidate findings. If a significant effect requires a large number of case replacement to invalidate, it is safe to conclude that the finding is fairly robust.

Dependent Variable

The dependent variable for this analysis was a user's extremist ideology expressed at time t (EI_{it}). Multiple variable structures were used given the results of reliability and factor analyses in line with the analyses performed in Objective 1 (see above). For this analysis, a 13 item scale was used which included aspects of both the Kerodal et al. (2016) model and our additional measures assessing minority-group sentiment. The variables included were: conspiratorial beliefs, xenophobic content, anti-government sentiment, anti-tax sentiment, survivalist content, anti-gun control sentiment, anti-African American, anti-Latino, anti-Immigrant, anti-LGBTQ, anti-Jewish, anti-Catholic, and anti-Islamic sentiment. Given that the social influence model was conducted at the user-level, reliability tests were performed after aggregating all ideological posts for all users. The Cronbach's alpha is relatively high ($\alpha = 0.803$), indicating a high reliability of this measurement for the dependent variable. As such, all 13 items were used to measure users' extreme far-right ideological beliefs for all analyses.

In total, there were 2,851 users and 27,407 posts spanning from 2001 to 2015 across all seven forums. Of all posts, 60.3% (n=16,531) contained far-right ideological content. It is worth noting that of the 2,851 users, there were 44 users with the same name across all forums. Three of these names appeared in three forums, while the remaining users appeared in two forums. Since no identifiable information was collected from the posters, it is impossible to determine if these accounts were made by the same individual or reflect a simple coincidence in the use of common phrasing related to the far-right movement.

Table 4: Descriptive Statistics for Variables

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Ideological Beliefs	24308	0	134	0.29	2.49
LnExp	24308	0	9.95	0.43	1.41
Indeg	24308	0	258	0.80	5.90
Movement Image	24308	0	1	0.08	0.28
Movement Name	24308	0	1	0.05	0.23
Length	16557	0	160	43.04	31.17
No. of Thread Started	24308	0	104	0.17	1.62
Self-Claim	24308	0	1	0.01	0.09
Prior	24308	0	134	0.28	2.45
NoExposure	24308	0	1	0.85	0.36
RealLife	24308	0	1	0.98	0.13
2003	24308	0	1	0.03	0.18
2004	24308	0	1	0.03	0.18
2005	24308	0	1	0.05	0.22
2006	24308	0	1	0.05	0.22
2007	24308	0	1	0.05	0.22
2008	24308	0	1	0.10	0.30
2009	24308	0	1	0.10	0.30
2010	24308	0	1	0.11	0.32
2011	24308	0	1	0.12	0.32
2012	24308	0	1	0.11	0.31
2013	24308	0	1	0.12	0.32
2014	24308	0	1	0.12	0.32
Forum1	24308	0	1	0.07	0.26
Forum2	24308	0	1	0.27	0.44
Forum3	24308	0	1	0.18	0.39
Forum4	24308	0	1	0.01	0.09
Forum5	24308	0	1	0.05	0.22
Forum6	24308	0	1	0.41	0.49
Forum7	24308	0	1	0.01	0.10

Independent Variables

There were four independent variables for this study (see Table 4). Each of the independent variables corresponds to the four theoretical components of the social learning theory (Akers, 2009). The focus of this analysis to assess the extent to which ideological messaging changes as a function of participation in forums. The first component is differential association ($\sum_{i'=1}^{n} DA_{ii'_{t-1 \to t}} EI_{i'_{t-1}} \times RK_{i'_{t-1}}$), which is also referred as the exposure term. Since there are various modalities to differential association (Akers, 2009), this variable is measured as the number of interactions between user pairs during the specified time frame weighted by the ranking of the user i' ($RK_{i'_{t-1}}$). This measurement accounts for the frequency and intensity of association (Akers, 2009). In other words, the attitudes of users with higher ranking and more frequently interacted with would exert more influence on user i.

The number of interactions refer to instances where a user has responded to another user's post. The response can occur in one of the following manners: 1) a direct response where a user quoted the post of another user, 2) a response where a user did not directly quote but is responding to the topic of the thread, and 3) a response to another user within a thread but did not use direct quote. With the second instance, the interaction is attributed to the thread starter. These interactions are conceptualizations of social ties between users since they capture the flow of information, in this case far-right ideological beliefs and values, between specific pairs of users. With differential association, it is also necessary to account for the unique nature of online communication. The ability to communicate in an asynchronous platform like a forum transcends physical boundaries as well as temporal bounds (Wellman, 1997). Most of the coded social interactions between users occurred during time *t-1*. In other words, both users posted during time *t-1*. Nevertheless, there were interactions during which a user to respond to content posted in earlier time frames, such as time *t-2*. For example, during time *t-1*, User C responded to User A's post from time *t-2*. As a result, the ideological coding for User A's post from time *t-2* is included in the analysis for time *t-1* because User C was exposed to that post during time *t-1*.

Definitions ($EI_{i'_{t-1}}$) were measured as the extreme far-right beliefs of user i' that user i had interacted with during the specified time frame. This variable is measured in the same manner as the dependent variable, but during time *t-1*. This allows us to take the peer group's definitions into consideration when examining their influence. The ranking of the user i' ($RK_{i'_{t-1}}$) was measured as categorical variable to account for variations in forums' hierarchical structures. For example, Forum 4 had five levels of ranks: administrators, approved members, probationary members, no title, and banned. Across all seven forums, administrator were measured as the highest rank across all seven forums and the ranking started with "1", which indicates the lowest rank. The lowest rank for five forums was "Banned", while it is "Guest" for Forum 5 and "On Leave, Gone" for Forum 7.

Differential reinforcement ($DR_{i_{t-1}}$) was measured as the in-degree of user i. The in-degree was defined as the number of in-coming connections and/or nominations from users and is a partial component of degree centrality (Wasserman & Faust, 1994). Differential reinforcement refers to the consequences, either real or perceived, that are associated with the behavior at question (Akers, 2009). In this context, responses from other users were seen as positive reinforcement because it is a proxy for understanding social support within these online communities where most social interactions were carried out via public posts or private messages (Bowman-Grieve, 2009; De Koster & Houtman, 2008). Specifically, the more responses

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received by users, the higher the chance for a user to experience radicalization as a result of being a welcomed member into the community.

Imitation ($IM_{i_{t-1}}$) was measured with two items: movement-related username and movement-related signature imagery. Both items were binary variables. Movement-related username measured if a user has a username that contains symbols, words, and/or phrases that are related to far-right movement. Movement-related signature imagery measured if a user has movement-related pictures as part of his/her signature. A signature on a forum post functions much like a signature in real-life, where it will appear at the end or bottom of a post. These two items were used as independent variable measures for imitation in this analysis rather than dependent variables to assess users' attempt to mimic other users' expression of their online identities within the far-right movement (De Koster & Houtman, 2008).

Control Variables

The study used five control variables for the model within each forum: 1) length of participation, 2) number of threads started by users, 3) users' claim as a supporter or member of the movement, 4) the user's prior attitude and 5) if user i experienced exposure. The length of participation ($PT_{i_{t-1}}$) was measured as the number of months between the user's registration date to time t. For users who did not have a registration date, such as guest users, the date of the first post was used as a proxy for determining length of participation. Users who registered at time t-1 are including in subsequent models from time t and onward.

This variable was included for two reasons. First, it is likely that the longer a user has been a member of a forum, the more in-degree he/she will receive given the user's assumed seniority. This distinction between old and new members is a feature of online communities that highlight the importance of active involvement and participation (Bowman-Grieve, 2009). Second, the longer length of participation could also be correlated with an increased integration of movement-related beliefs into one's online identity as radicalization happens gradually (Borum, 2011; Holt, Freilich, Chermak, & McCauley, 2015; Koehler, 2014; McCauley & Moskalenko, 2008). By controlling for length of participation, it ensures that any effect of the theoretical components is not residual of other factors.

The second control variable was the number of threads started by user i ($TS_{i_{t-1}}$) at time t-1. This variable was a proxy measure for racial awakening because users were encouraged by the forums to be involved in the communities (Bowman-Grieve, 2009; De Koster & Houtman, 2008). New members were encouraged to ask questions and seek out new information while the older members provided knowledge (Bowman-Grieve, 2009). In addition, users who had experienced stigmatization offline were drawn to the anonymity and freedom of expression on these forums (De Koster & Houtman, 2008). Thus, measuring the number of threads started were appropriate for users' investment and attachment to far-right ideologies and movement.

The third control variable were users' claims as supporter or participants in a particular movement or group, measured as self-claims in Objective 1 analyses ($SC_{i_{t-1}}$). This control variable accounted for the assumption of users' variations in radicalization processes which may occur on or off-line (Sunstein, 2007; Warner, 2010). Users who publicly claimed to be a supporter on far-right extremist forums may have distinct reasons and purposes for participating in the forums (De Koster & Houtman, 2008). Differential associations, differential reinforcement and imitation had stronger impacts on the acceptance of new beliefs compared to the maintenance of an existing belief in tests of SLT (Akers, 2009). Controlling for pre-existing

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potential memberships allowed for better identification of any effects of social learning relative to online radicalization processes generally.

The fourth control variable was the attitude of user i at time $t\text{-}1$ ($EI_{i_{t-1}}$). An exception to this measurement was for the first model within all forums. Rather than using the attitude of user i at time $t\text{-}1$, these models included the attitude of user i at time t due to the lack of data. It was necessary to control for prior definitions because they may be associated with prior associations (Akers, 2009). Akers (2009) suggests that earlier associations with family members or peers could condition future associations. For example, individuals exposed to law-abiding definitions during their childhood are less likely to meet those who hold deviant definitions later (Akers, 2009). The same appears to be true with respect to radical ideologies generally (e.g. Holt et al., 2018). In addition, controlling for prior definition accounts for dependencies that result from an individual's decision to interaction with those who hold similar views (Steglich, Snijders, & Pearson, 2010). Thus, to assess the influence of participation in online far-right forums, it is necessary to control for users' initial attitudes.

The fifth control variable measured the exposure experienced by user i during time $t\text{-}1$ ($NE_{i_{t-1}}$). This was a binary variable where "1" indicated that user i did not have any exposure to others at previous times. In other words, users who posted in a thread or responded directly to another user's post during time t-1 will be coded as "0" because they were exposed to some content. The inclusion of this control variable is to distinguish between two types of users with an exposure term of zero. The first type of users included users who posted but were exposed to non-ideological content. The second type refers to users who did not post at all during time $t\text{-}1$. This binary variable allowed us to measure if passive involvement in forums contributed to radical ideological expression over time.

There were additional control variables for the full-forum model. To control for fixed-effects in the full-forum model, binary variables for years and forums were included. The year 2009 and Forum 5 were chosen as the reference group because it was the second year with models from each forum. Forum 5 was the reference group because it was the median for both the number of users and threads compared to other forums. Forum 5 also had a well-known offline association to a real-world group. Thus, the use of a reference group provided some insight as to the online and offline dynamics between forums. Lastly, there is a binary variable that measures whether a forum has offline associations ($RL_{i_{t-1}}$). As a result, the social influence model for the full-forum model is represented as follow:

$EI_{it} = \rho \sum_{i'=1}^{n} DA_{ii'_{t-1} \to t} EI_{i'_{t-1}} \times RK_{i'_{t-1}} + \gamma_1 DR_{it-1} + \gamma_2 IM_{it-1} + \gamma_3 PT_{it-1} + \gamma_4 EI_{it-1} + \gamma_5 TS_{it-1} + \gamma_6 SC_{it-1} + \gamma_7 NE_{it-1} + \gamma_8 RL_{it-1} + \gamma_9 Year2003_{it-1} + \gamma_{10} Year2004_{it-1} + \gamma_{11} Year2005_{it-1} + \gamma_{12} Year2006_{it-1} + \gamma_{13} Year2007_{it-1} + \gamma_{14} Year2008_{it-1} + \gamma_{15} Year2010_{it-1} + \gamma_{16} Year2011_{it-1} + \gamma_{17} Year2012_{it-1} + \gamma_{18} Year2013_{it-1} + \gamma_{19} Year2014_{it-1} + \gamma_{19} Forum1_{it-1} + \gamma_{20} Forum2_{it-1} + \gamma_{21} Forum3_{it-1} + \gamma_{22} Forum4_{it-1} + \gamma_{23} Forum6_{it-1} + \gamma_{24} Forum7_{it-1}$

Full-Forum Models

Table 5 contains the descriptive statistics for the full-forum model, constructed from the 46 individual within-forum models produced. Most posts within this model were from Forum 2 and Forum 6 and made in 2008 and beyond. The dependent variable, extreme ideological beliefs, appeared to be skewed as most values fall around zero. Similarly, the exposure term remained

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skewed despite transforming the variable using the natural log function. The low mean also suggests that most users did not experience exposure while participating in these forums. In addition, a majority of users across these forums and time points did not start threads, use movement-related images and names, or claim to a supporter of the movement. For length of participation, the number of cases were smaller compared to other variables because users that had yet to join the forum at a specific time point were excluded from the individual within-forum model for that time point.

For the full-forum data, a total of four models were produced to understand the effects of the variables (see Table 5). Results from Model 1 showed that the SLT variables accounted for 25.6% of variance. The results suggested that users who experienced higher exposure to and a higher number of responses from others were more likely to hold extreme ideological beliefs. Differential reinforcement had the largest beta coefficient ($\beta = 0.189$), followed by differential association ($\beta = 0.118$). This result was unexpected because it is contrary to Akers' proposition that differential association was the context for the remaining three components (Akers, 2009). Similarly, the use of movement-related images as a metric of imitation was negatively correlated with extreme ideological beliefs. The use of movement-related names was not significant. These results showed initial support for SLT as an appropriate framework for understanding online radicalization.

In Model 2, control variables were added, which reduced the sample size ($n = 16,557$) due to the inclusion of users' length of participation. The inclusion of control variables also led to a small increase in the standard errors of some variables, suggesting a potential issue with multicollinearity. The VIF values did not suggest an issue, and the standard errors of variables remained stable in Model 3 and Model 4. It is safe to conclude that multicollinearity was not an issue with these models.

Overall, Model 2 accounted for 31.6% of variance. The social influence model indicated that across all forums, users who experienced more exposure to others, received higher number of responses to posts, had a movement-related name, were newer members, started fewer number of threads, did not claim to be a supporter, with higher prior beliefs were more likely to hold extreme ideological beliefs. Of these predictors, differential reinforcement had the strongest effect ($\beta = 0.264$), followed by differential association ($\beta = 0.166$) and no exposure ($\beta = 0.074$).

The results from Model 2 showed again that the effect of differential reinforcement was greater than that of differential association, which is contrary against the theoretical propositions of SLT (Akers, 2009). The support is less strong for imitation as a movement-related image in posts was no longer significant, and the effect of a movement-related name was the second lowest among all variables.

The correlation between length of participation was consistent with the current literature on the roles assigned to older versus new members in online far-right forums (Bowman-Grieve, 2009). Similarly, the correlation between not claiming to be a supporter and higher prior beliefs suggest that users in this dataset may have demonstrated different degrees of radicalization (Borum, 2011; Holt, Freilich, Chermak, & McCauley, 2015; Koehler, 2014; McCauley & Moskalenko, 2008). Users who did not claim to be a group member or supporter and had higher beliefs were becoming more receptive towards extreme ideological beliefs on these forums.

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Table 5: Social Influence Model for All Forums

	Model 1			Model 2			Model 3			Model 4		
	Regression Coefficient	Std. Error	Beta	Regression Coefficient	Std. Error	Beta	Regression Coefficient	Std. Error	Beta	Regression Coefficient	Std. Error	Beta
Constant	0.143**	0.016		-0.286	0.143		-0.071	0.158		-0.494**	0.128	
Social Learning												
LnExp	0.208**	0.014	0.118	0.259**	0.018	0.166	0.261**	0.018	0.168	0.227**	0.018	0.146
InDeg	0.080**	0.003	0.189	0.096**	0.004	0.264	0.096**	0.004	0.263	0.099**	0.004	0.272
Movement Image	-0.219**	0.068	-0.025	0.064	0.075	0.008	0.083	0.075	0.011	0.136	0.076	0.017
Movement Name	0.150	0.079	0.014	0.221**	0.082	0.023	0.229**	0.082	0.024	0.177*	0.083	0.019
Control												
Length				-0.003**	0.001	-0.037	-0.001	0.001	-0.018	0.000	0.001	-0.004
No. Thread Started				-0.077**	0.014	-0.058	-0.076**	0.014	-0.058	-0.080**	0.014	-0.061
Self-Claim				-1.005**	0.182	-0.042	-0.987**	0.183	-0.042	-0.846**	0.183	-0.036
Prior Beliefs				0.017*	0.007	0.020	0.019**	0.007	0.021	0.014**	0.007	0.016
No Exposure				0.460**	0.072	0.074	0.485**	0.073	0.078	0.412**	0.074	0.066
Real Life				0.037	0.129	0.002	-0.089	0.131	-0.005			
Year												
2003							0.172	0.319	0.004	0.192	0.321	0.005
2004							0.256	0.183	0.011	0.268	0.186	0.012
2005							-0.262	0.145	-0.015	-0.229	0.148	-0.013
2006							-0.126	0.113	-0.010	-0.118	0.115	-0.009
2007							-0.194	0.108	-0.016	-0.176	0.110	-0.015
2008							0.083	0.096	0.008	0.104	0.097	0.010
2010							-0.056	0.085	-0.007	-0.068	0.086	-0.008
2011							-0.253**	0.083	-0.033	-0.292**	0.085	-0.039
2012							-0.309**	0.084	-0.041	-0.380**	0.087	-0.050
2013							-0.250**	0.082	-0.036	-0.315**	0.087	-0.045

	Model 1			Model 2			Model 3			Model 4		
2014							-0.309**	0.083	-0.045	-0.383**	0.090	-0.056
Forum												
Forum1										0.253*	0.113	0.029
Forum2										0.639**	0.100	0.105
Forum3										0.323**	0.107	0.051
Forum4										0.300	0.235	0.010
Forum6										0.373**	0.108	0.071
Forum7										0.653**	0.181	0.030
R^2	0.256			0.316			0.319			0.324		
n	24308			16557			16557			16557		

Note: $*p < 0.05$, $**p < 0.01$

The positive correlation between users with no exposure and extreme ideological beliefs was surprising. This finding showed that users who did not actively respond to other users' posts, or potential lurkers of forums, were more ideologically expressive. This may reflect a different subset of users across forums more in line with McCauley and Moskalenko's (2008) proposition of slippery slope effects. McCauley and Moskalenko (2008) described this group of users as individuals who gradually become more radicalized through self-persuasion and justification. For this subset of users, it may be that their motivation for joining these forums was for information rather than social supports from the virtual community that emphasizes social interactions (Bowman-Grieve, 2009; De Koster & Houtman, 2008).

Sensitivity analyses for Model 2 (table not presented) supported the suitability of SLT as a theoretical framework for understanding ideological expression and potential radicalization. To invalidate the significant inferences of differential association and differential reinforcement, 86% and 92% of cases respectively need to be replaced with null cases (Frank, Maroulis, Duong, & Kelcey, 2013). Movement-related names, on the other hand, required 27% of cases to be replaced to invalidate the inference. Users' inclusion of a movement-related image also required a replacement of 56% of null cases to meet the threshold of inference showing its lack of unique contributions in predicting extreme ideological beliefs. The number of threads started, users' claims as supporters of movements, and users' lack of exposure all required replacements of more than 64% of cases to invalidate the inference. Users' prior beliefs had the weakest overall inference, as only 19% of cases need to be replaced with null cases (Frank, Maroulis, Duong, & Kelcey, 2013).

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With Model 3 and Model 4, binary variables of years and forums were included to account for fixed effects across forums (see Table 5). The inclusion of years in Model 3 yielded almost the same results as Model 2 in terms of the unique contributions from the variables. There was one major change between Model 2 and Model 3. Users' length of participation became non-significant. Sensitivity analyses (table not presented) showed that to sustain the inference, 49% of cases need to be replaced with cases that meet the threshold for inference. Thus, the inference drawn for length of participant was quite weak since it would require a replacement of almost half of the null cases for the variable to reach significance.

The inclusion of year binary variables revealed a temporal pattern across these forums. Compared to the year of reference, 2009, posts between 2003 and 2007 were non-significant but posts from 2010 and beyond were significantly less radical. This comparison suggests a spike in expressed extreme ideological beliefs across all seven forums. One potential explanation for this spike was the political climate between 2008 and 2009 in the United States. In 2008, Barack Obama was elected and was the first black president, which may have forced a spike in posts associated with race and far-right ideological beliefs generally.

Table 6. Social Influence Model with Interaction Term

	Regression Coefficient	Std. Error	Beta
Exposure*Post2009	0.129**	0.032	0.077
Independent Variable			
Exposure	0.129**	0.032	0.083
In-Degree	0.100**	0.004	0.274
Movement Image	0.117	0.076	0.015
Movement Name	0.166*	0.083	0.017
Length	-0.002**	0.001	-0.027
No. Thread Started	-0.083**	0.014	-0.063
Self-Claim	-0.816**	0.184	-0.034
Prior Beliefs	0.012	0.007	0.013
No Exposure	0.397**	0.074	0.064
Real Life			
Post2009	-0.216**	0.064	-0.033
Forum1	0.433**	0.110	0.049
Forum2	0.660**	0.100	0.108
Forum3	0.469**	0.103	0.074
Forum4	0.227	0.235	0.008
Forum6	0.526**	0.102	0.099
Forum7	0.645**	0.181	0.030
Constant	-0.560**	0.119	
R-Square		0.321	
N		16557	

Note: * $p < 0.05$, ** $p < 0.01$

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This temporal pattern was further confirmed when a new binary variable was included in the model. Posts made after 2009 were coded as "1" for this new variable. To determine if the effect of differential association differed before and after the year 2009, a fifth model that included an interaction term between posts made after 2009 and the exposure term was ran (see Table 6). Results from this table was presented in Table 6. The interaction term was significant and therefore indicated a difference in the effect of differential association before and after 2009.

When comparing across forums there were significant differences as well. All forums except for Forum 4 expressed significantly more extreme ideological beliefs compared to the reference forum. This is surprising as the reference forum, Forum 5, was affiliated with a well-known offline far-right organization. The coefficients for these forums also suggest three levels in far-right ideological beliefs. The highest levels consisted of Forum 2 and Forum 7, followed by the second level with Forum 3 and Forum 6. Forum 1 and Forum 4 were in the last level.

Objective 3: Discussions Related to Technology Use

To address Objective 3, this analysis focused on the posts made in five of the forums sampled to reflect discussions related to computers and information security generally. Only those subforums specifically related to computer use and communication of technology were included in the sample to more accurately assess the extent to which more serious security matters and tools were discussed. Subforums related to video games/online game play, media/video links, and electronic activism were excluded, though collected and included in analyses related to ideological expression to more succinctly represent all user behavior. Qualitative content analyses were utilized to count and capture the extent to which individuals discussed various technologies.

The analyses of forums demonstrated that individuals gave a range of advice or directly asked and answered questions related to commonly used consumer tools and technologies (see also Holt & Bolden, 2014). In 16.7% of posts individuals shared resources with originating posters or provided direct information, whether related to computer/hardware and software, web servers, or good encryption tools.

Users overwhelmingly discussed computer hardware and software, with 31.1% of discussions involving these technologies. Overt discussion of specific vendors was less common with only 10.1% of posts involving specific products. The majority involved Linux products (n=63; 7.9%) due to users' interest in the efficacy and usability of open source software for their devices. Mobile phones and devices were discussed in 1.8% of all threads as well.

The majority of discussions did not focus on specialized technological knowledge, with only 0.8% of posts involving discussions of programming. There was also limited discussion of web design (1.5%), suggesting users were not focused on creating new web pages or content to be hosted on their own websites. Only 2% of threads involved discussions of web servers and hosting/connecting issues.

Encryption tools and methods were discussed in 5.8% of all threads, with direct mentions of Tor (3.5%) as a means of Internet connectivity to improve user anonymity. Tor, or The Onion Router, is a free-to-use browser plug-in that encrypts and routes Internet traffic through other Tor users' computers to obfuscate online activity and minimize attribution (Barratt, 2012; Martin, 2014). Tor can also be used as for web hosting to conceal the physical location of servers and users, as evident in the transition of the white nationalist website the Daily Stormer from the

open web to a Tor-based hosting service in the wake of the Charlottesville, Virginia riots of 2017 (Gibbs, 2017). Relatedly, Internet Service Providers (ISPs) were discussed in 5.1% of all threads, particularly their efforts to detect, remove, and block access to white nationalist and extremist group content. Social media providers were discussed in 6.9% of all threads, including Facebook, Twitter, and YouTube. There was generally little discussion associated with banning or blocking content on these sites, instead discussing their use and general benefit. This may be a function of the fact that these posts were made prior to large scale removals of far-right groups from social media platforms (e.g. Gibbs, 2017).

There was also some discussion of law enforcement actions to either surveil or take action against illicit activities online (8.6%). The users discussed issues related to actions by law enforcement agencies to more effectively surveil online activities or identify criminal activity, as well as some forms of cybercrime like computer hacking. In fact, computer hacking was discussed in 6.9% of all threads, mostly involving hackers' efforts to steal information, establish malware infections, and cause harm to Internet users.

Objective 4: Social Network Analyses

To address Objective 4, this analysis focused on the posts from seven of the forums sampled. Social network analyses enable researchers to visualize user communications and network connections based on different parameters unique to the nature of their associations. To that end, this analysis focused on the discussions by individuals on the basis of their responses to posts made within threads to highlight interconnecting associations between actors. An individual's username served as the pretext to connect potentially different actors appearing in the same threads. This decision also excludes the appearance of redundant ties that can appear in analyses of forum data due to individuals replying to their own posts, or frequently creating new threads that generate no replies (e.g. Holt et al., 2016).

In this analysis, individual posters were represented as network vertices (V) and their interactions with others (C) create connections between them referred to as arcs (Zhang, Ackerman, & Adamic, 2007). The username for each individual, or vertex, was represented as a dot which can be connected by arcs to demonstrate ties based on mutual communication. There are some instances where vertices are isolated, which reflects a post in a thread they made which drew no other participants. The size of vertices reflects their ideological beliefs: the larger the circle, the more ideological expression associated with that username over time. Users with no visible circle made no identifiable ideological content during the period of observation.

This analysis also assumed that there was a general directionality of posting, with arcs going from the first poster in a thread to all those participating in the discussion. This unidirectional assumption precludes the possibility that conversation flows may go between participants in thread as well as to the thread starter. Due to the size of the forums sampled and the various population sizes observed, this analysis followed Holt et al.'s (2016) strategy to visualize networks on the basis of constant flows of information from the first post to all participants.

Future research should utilize different visualization and connection methods to assess differential network tie formation. In addition, these networks only reflect the visible discussions between participants in the forums. Any private communications between users could not be identified, and was excluded from analysis.

To examine the relationships between participants, basic statistics were conducted to assess the structural characteristics of the networks (see Table 7). First, network density and

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Table 7: Network Statistics by Forum

| | | | | % in | Original Network | | No Loops, No Multiple Lines | | |
| | # of | # of | # of | Largest | Network | Ave. | Network | Ave. | All Degree |
Forum	Users	Threads	Posts	Component	Density	Degree	Density	Degree	Centraliziation
1	293	131	936	35.15%	0.009	5.440	0.007	4.443	32.500
2	926	1454	10192	53.14%	0.009	17.092	0.005	10.933	179.420
3	443	303	1947	49.21%	0.007	6.726	0.006	5.309	31.989
4	45	130	1378	68.89%	0.543	48.888	0.088	7.822	20.500
5	250	906	6544	65.6%	0.084	42.288	0.041	20.696	82.822
6	829	1331	6113	53.20%	0.005	9.534	0.004	6.651	68.840
7	65	103	297	38.46%	0.042	5.507	0.043	3.723	10.460

degree connectivity were calculated to assess the overall composition of the relationships. Density was determined based on the ratio of existing ties to the number of all possible ties that could be made within the network of each forum. A higher overall network density value suggests that the network has greater capacity to move information between participants (de Nooy et al., 2005). Average degree connectivity was also calculated from the average number of users that could be connected through the network. This value measures how far knowledge can move through a network based on existing connections (de Nooy et al., 2005). Finally, the all degree centrality is calculated based on the general connectedness of users on the network based on associations with others in threads (de Nooy et al., 2005). All calculations and network visualizations were performed through the Pajek software suite(de Nooy et al., 2005).

When examining the structure of the networks on the basis of the full network compared to the network without self-loops and lines, we see that the majority of the forums have extremely low density, with most below one percent (n=5; 71.4%; see Table 7). Removing self-loops has a dramatic impact on the observed network density of Forum 4, suggesting it may be driven in large part by a small portion of posters' behaviors. In general, the lack of density suggests that there are substantial redundancies in these networks.
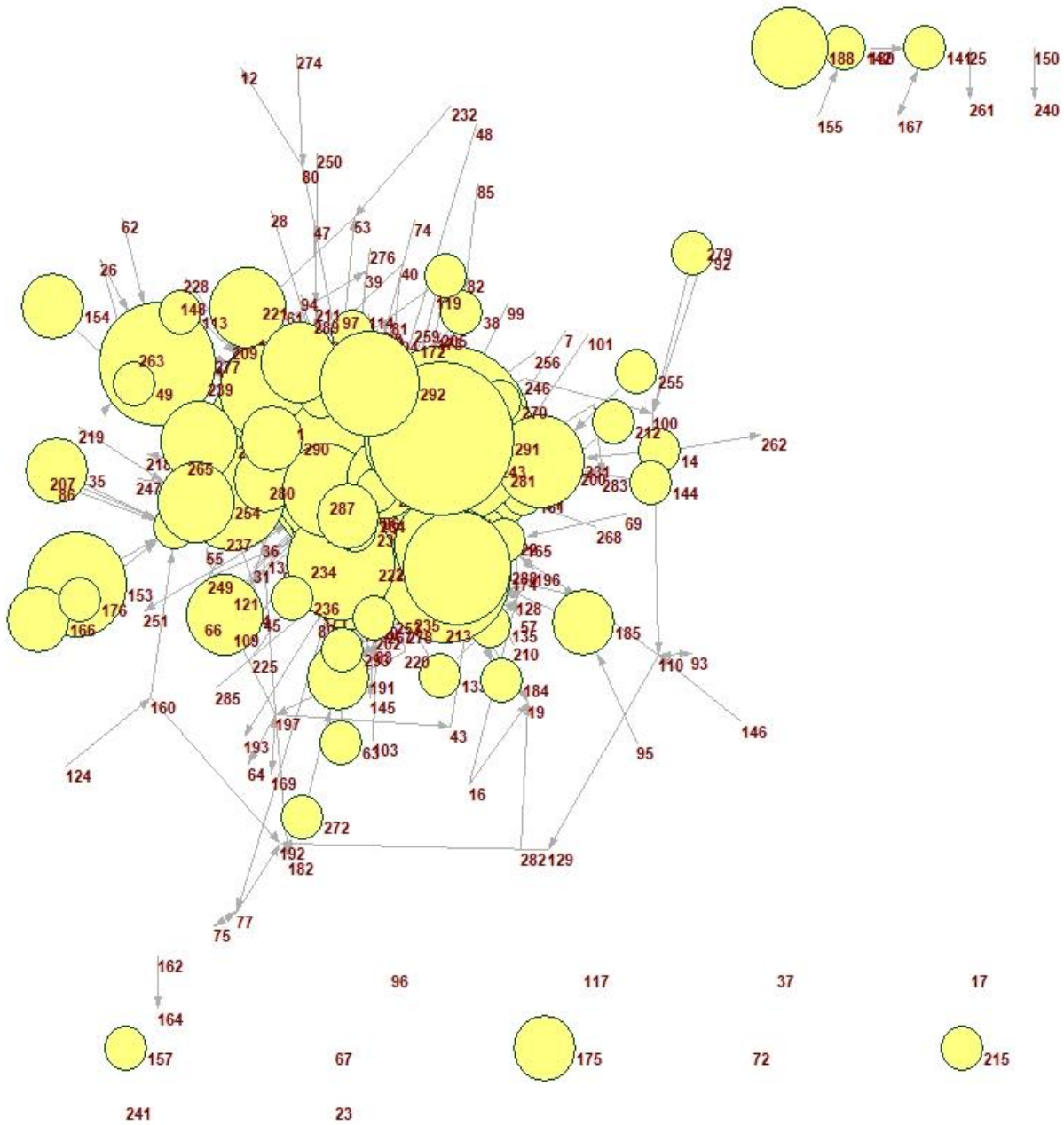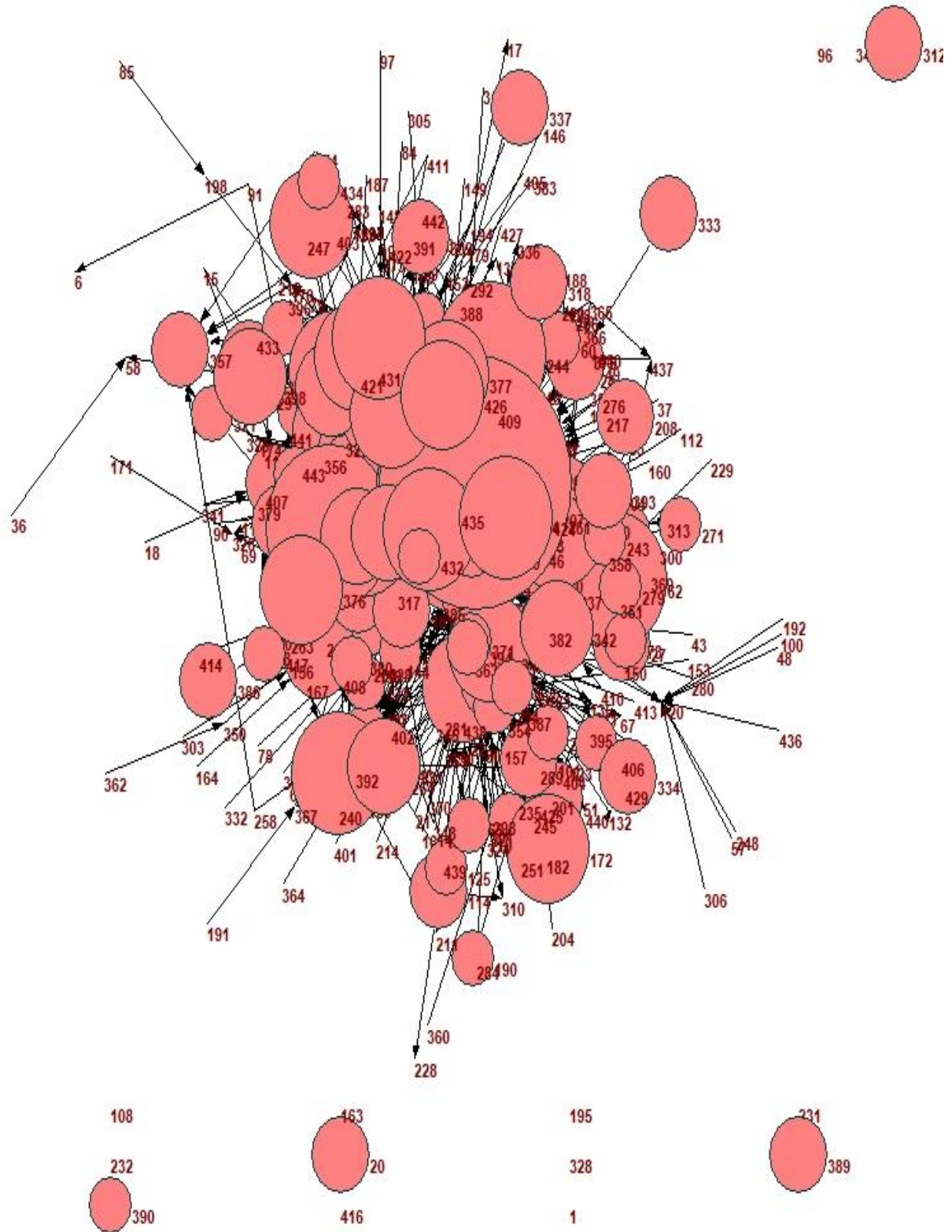
24

26

27
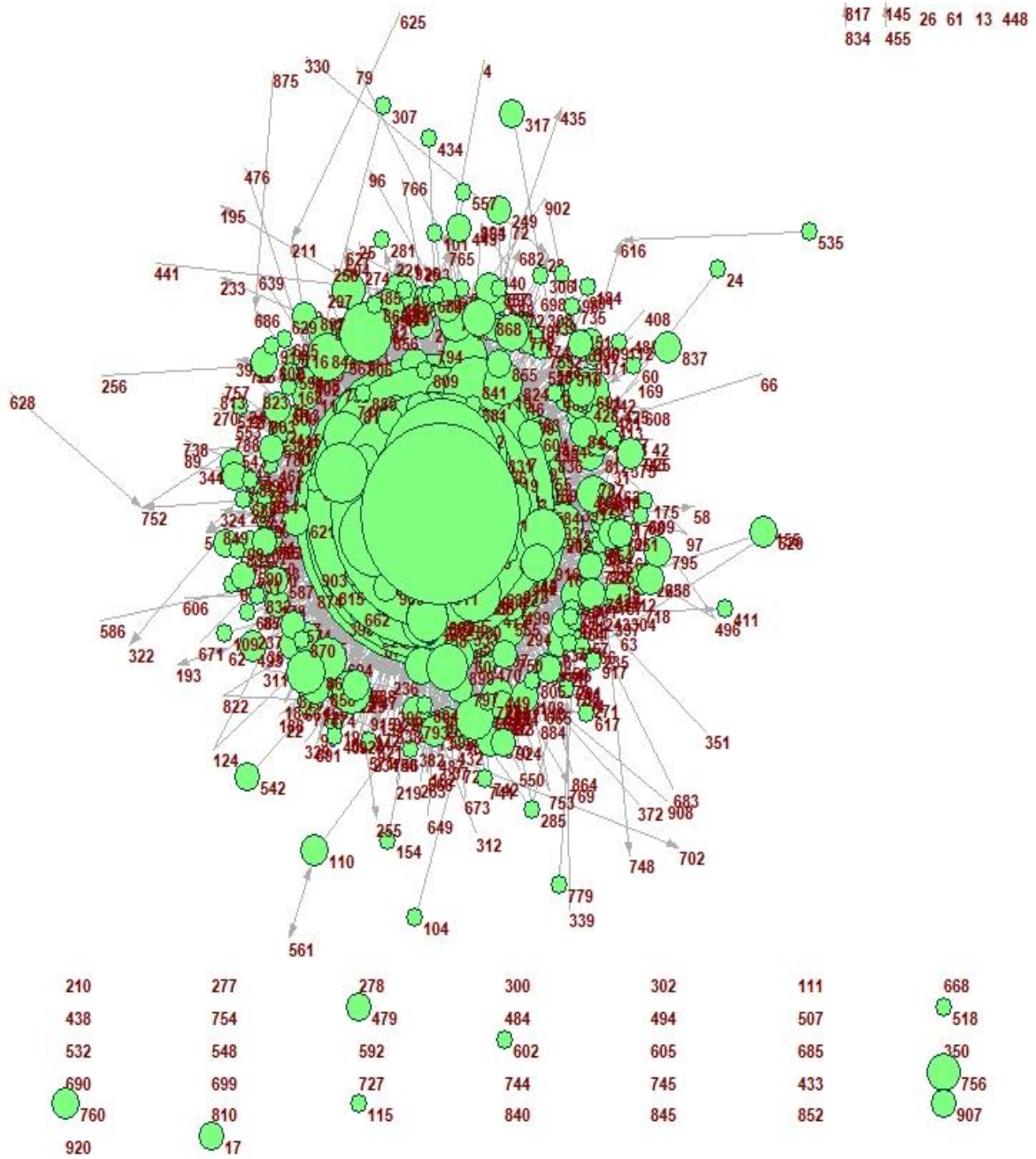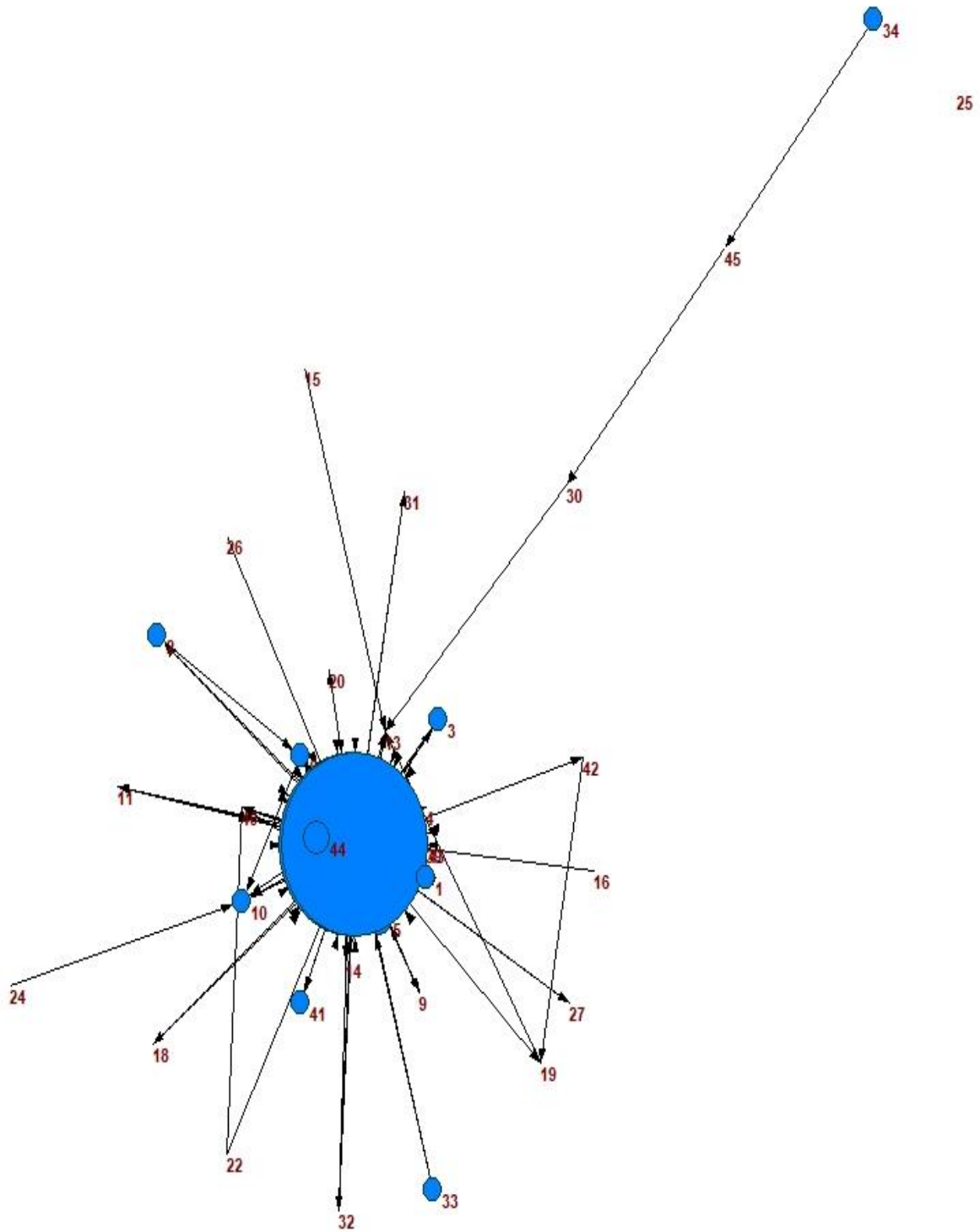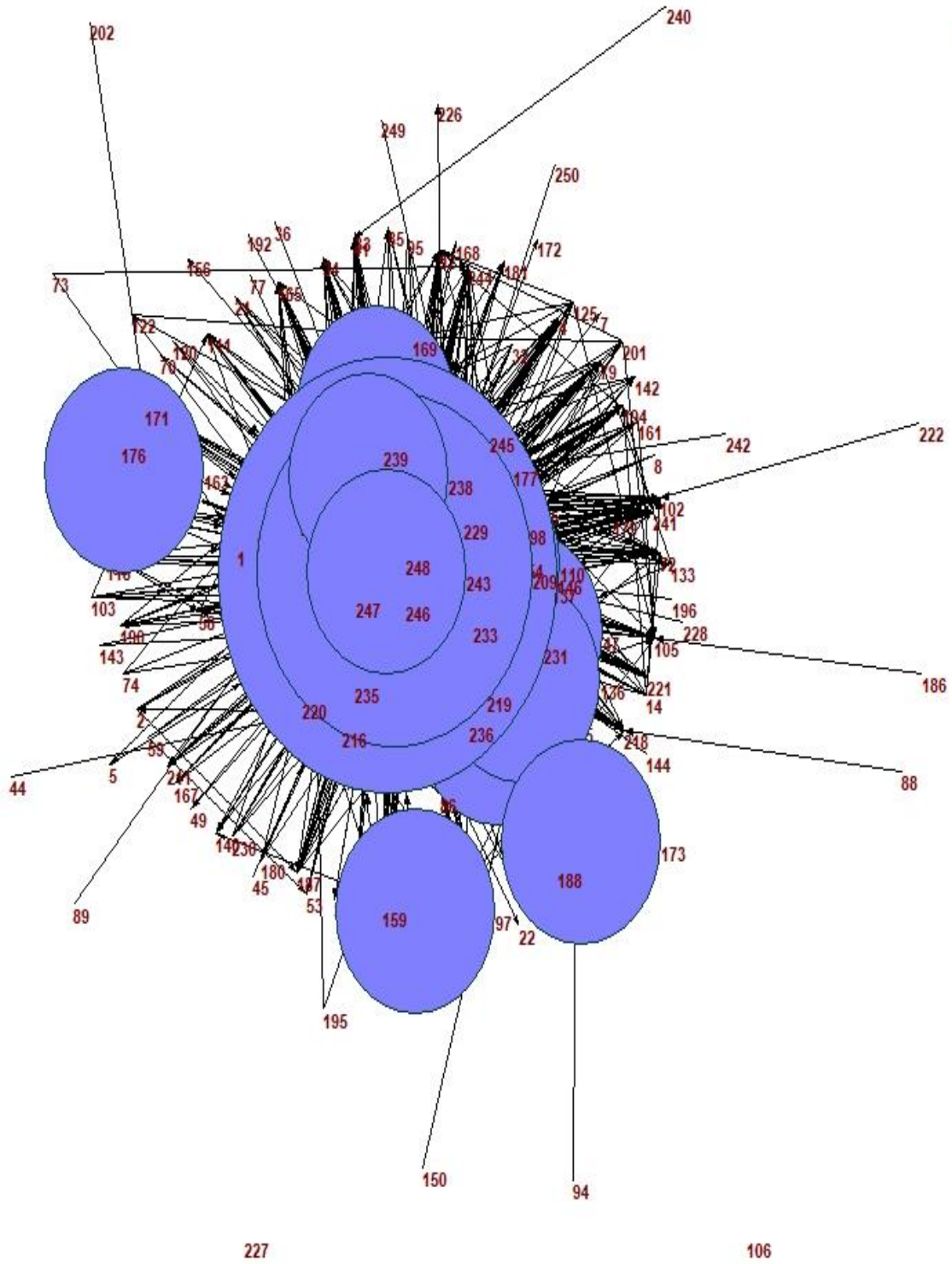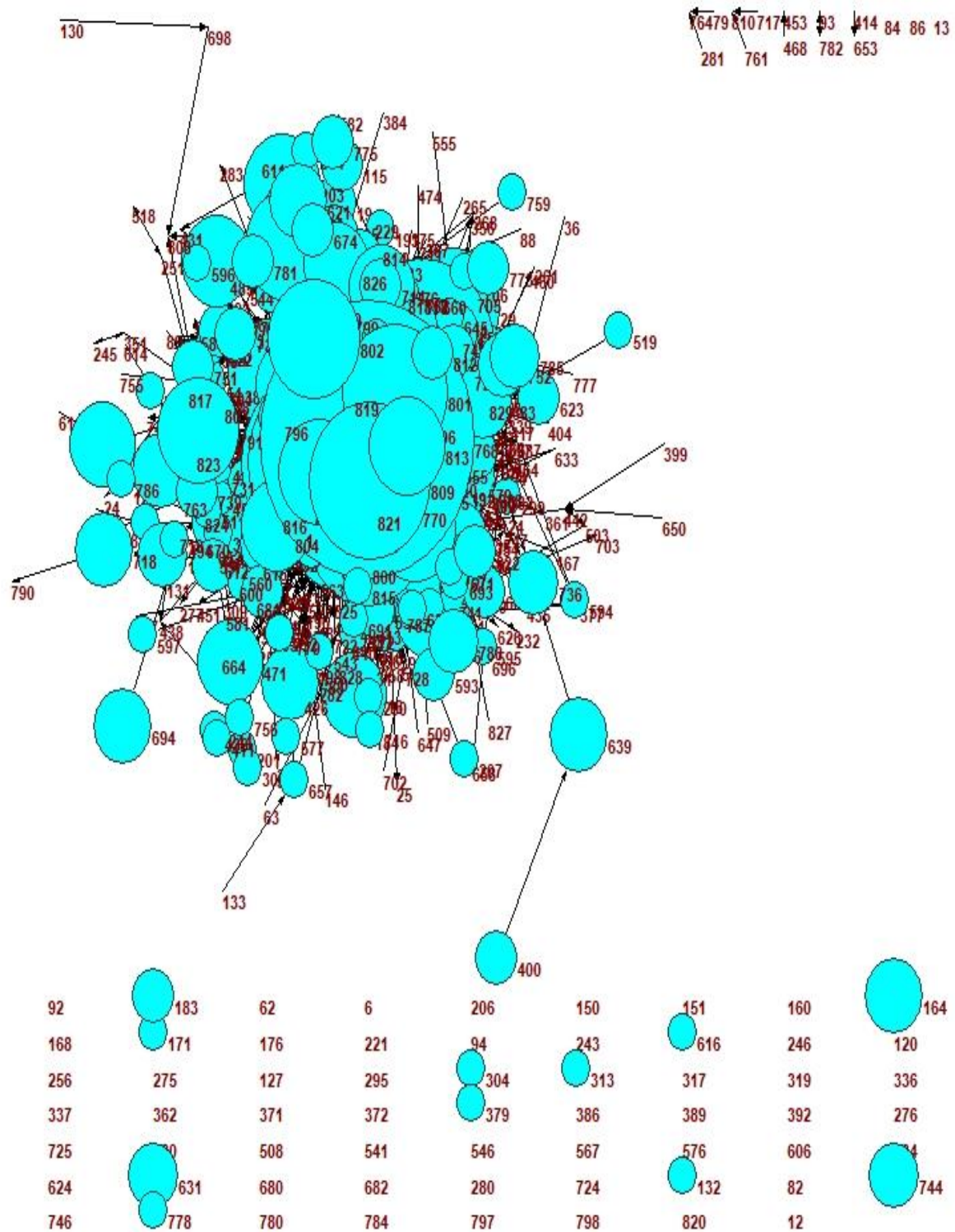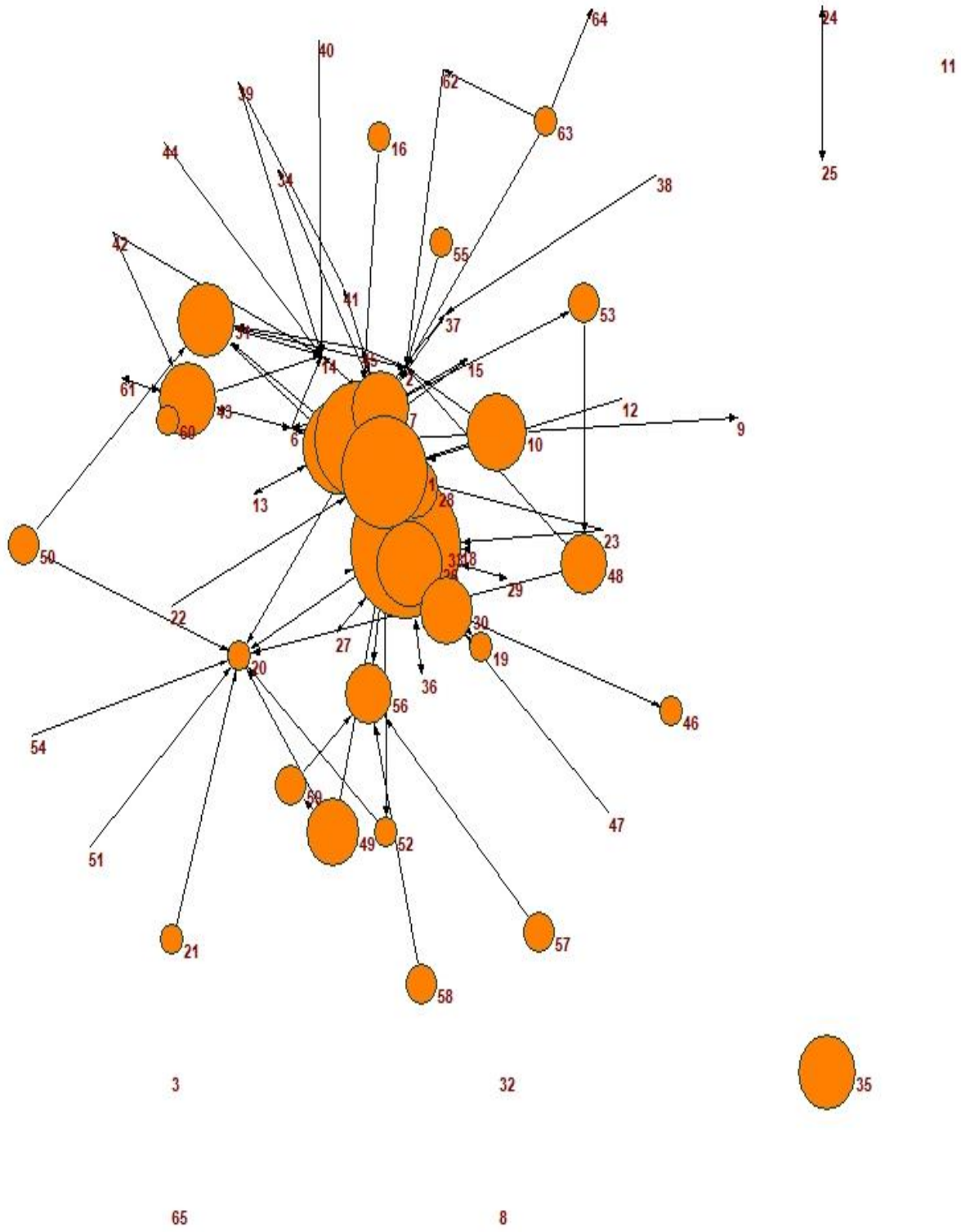
Any associations observed may encourage resiliency within the network by increasing the potential that actors could be easily removed and replaced by others. At the same time, the networks were largely inefficient at the flow of information as there was generally less connectivity between different subsets of the network. This was particularly evident when considering the average degree measures which reflect how many nodes on average could be connected through posts within the threads across the forum. While three of the forums appeared to have a high average degree for each node, removing self-loops reduced the degree of connectivity across the participants, dramatically in some cases within three forums (Forums 2, 4, 5).

In addition, when examining the all-degree centralization within the forums, it appeared that the majority of networks are neither highly nor rigidly structured. Instead, they were relatively loosely connected, particularly in Forums 1, 2, 3, and 6 where there are larger user populations with relatively low centralizations.

Examining the visualization of Forum 1 demonstrated a somewhat sizeable central cluster of connections, though there are several smaller clusters of participants across the forum based on mutual participation in threads (see Figure 1). Those in the center of the larger cluster appeared to be more ideologically expressive and connected. This network differed from Forums 2 and 3, which had more isolates, some of which appeared to be more ideologically expressive actors (see Figures 2 and 3). Those in the center were, however, more expressive than those in Forum 1. In addition, the central clusters from both Forums 2 and 3 were larger than what was observed in Forum 1. Since all these forums were tied to ideological groups, this may account for the higher proportion of ideological expression observed.

Forum 4 had no real world group affiliation, though there was greater connectivity which may be a function of the smaller number of participants in the site (see Figure 4). By contrast, Forum 5 was tied to a real world group, but had better connectivity than what was observed in the first three networks (see Figure 5). There was also generally less ideological expression in the peripheries of the network compared to those other forums.

Forum 6 was also associated with a real world group, though there were more isolates than in Forums 4 and 5 (see Figure 6). The central actors were, however, quite expressive and connected. Lastly, Forum 7 is a smaller general network of actors, and was not associated with any real world group (see Figure 7). There were several isolates and the central cluster was also smaller than what was observed in the majority of other forums.

Objective 5: Examination of Events

To assess the relationships between real world events and forum posting behaviors, the research team identified seven events that would serve as exogenous and endogenous shocks to the community. First, five key incidents associated with far right violence were selected with preference to events occurring during periods with the greatest overall posting frequencies across the forum data: 1) Wade Michael Page, 2). Jimmy Lee Dykes; 3). Christine and Jeremy Moody, 4). Paul Anthony Ciancia, and 5) Frazier Glen Miller. Page murdered six people and wounded others at a Sikh temple in Wisconsin on August 5, 2012. In early January (January 29, 2013), Dykes boarded a school bus, killed the driver, and took a young boy hostage. In July 2013, neo-nazis Christine and Jeremy Moody murder Charles Parker and his wife. Ciancia killed a TSA officer on November 1, 2013 at the Los Angeles Airport. Miller killed a 14-year-old boy and his grandfather outside a Jewish Community Center on April 13, 2014 in Kansas.

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These actors engaged in fatal shooting incidents in public places during 2012, 2013 and 2014 respectively. Additionally all had alignments with far right extremist group ideologies generally. A sixth incident was selected involving high profile jihadist violence to examine the extent to which far right posting behaviors were influenced by events occurring outside of the movement generally. The Boston Marathon bombing performed by Dzhokhar and Tamerlan Tsarnaev on April 15, 2013 was included in this analysis. Finally, the 2012 presidential election was included as a seventh event to serve as a control, assessing the extent to which an event external to the movement, but with potential ramifications to their existence would influence online discussions.

Due to inconsistencies in posting behaviors by forum users, a three month window was selected to examine if any changes were observed in the periods before, during, and after the event. The ideological content of posts were then compared by month using chi-square statistics to identify significant differences in posting behaviors generally.

Far Right Violence

Examining posts made around the Wade Michael Page incident demonstrated a general decline in posts during the period of observation. The number of posts decreased from 294 posts in July to 232 in August to 176 in September. No significant differences were observed in conspiratorial, xenophobic, anti-government, anti-tax, survivalist, gun control, participatory, self-claims, movement related usernames, or posts made based on forum affiliation. While there was an increase in participatory claims from July to August (n=5; n=12), it was not statistically significant. There was a statistically significant difference noted in the number posts with movement-related signatures or imagery ($x2=8.024*$), though it is a decline throughout the period. There was, however, a significant difference observed in anti-Islamic sentiment ($x2=31.957***$), with a spike in September of 12 posts from none observed in August, and one in July.

Posts occurring around the Jimmy Lee Dykes incident increased from December (n=238) to January (n=317), though there was a substantial decline in February (n=262). There was a significant difference observed in conspiratorial posts made during this period ($x2=18.847***$), though it was an increase from 5 posts in January to 19 in February. Similarly, there were significant differences observed in self-claiming posts ($x2=9.243*$), though they decreased during the period of observation from 14 posts in December to 4 by February. There was an increase in the number of posts made with movement-related names ($x2=8.699*$) from 82 posts in December to 118 in January and 122 in February. There was also a significant difference between posts in groups associated with real world forums ($x2=25.223***$), which had a higher proportion of posts in January compared to December and January. No significant differences were observed in xenophobic, anti-government, anti-tax, survivalist, anti-gun control, participatory, movement-related, or any biased sentiment toward various racial or ethnic groups.

There was a general increase in posts during the period of observation associated with the Moodys' violence, rising from 180 posts in June, 250 in July, to 282 in August. A significant difference was observed in xenophobic ($x2=8.635*$) and anti-government posts ($x2=6.098*$), with an overall increase noted across the period of observation. Survivalist posts were also significantly different across the period of observation ($x2=11.899**$), though four were observed in June and no others in July and August.

There were no anti-LGBTQ posts observed until August with eight total posts ($x2=12.337**$). There was also a substantial and significant difference observed in anti-African American ($x2=75.171***$) and anti-immigrant posts ($x2=10.780**$), which increased during the period with the majority occurring in August. No other significant differences were observed, particularly with respect to real world group posting or movement related posting characteristics.

There was some variation in posts around the Paul Anthony Ciancia incident, with an increase in posts made from October (n=216) to November (n=261), though it decreased in December (n=212). No significant differences were observed in conspiratorial, xenophobic, anti-government, anti-tax, survivalist, gun control posts. There was a significant difference in anti-African American posts ($x2=33.284***$), with a substantial increase in December (n=25) compared to October and November.

There was a significant difference in participation posts ($x2.=13.892***$), with nine observed in October, zero in November, and two in December. A similar trend of self-claim posts was observed, with a significant difference in posts related to self-claim observed ($x2=9.141**$), decreasing from seven posts in October to one post per month in the remaining period of observation. There was a significant difference in movement-related signatures and images (chi sq.=15.024**) and usernames (chi sq.=12.563**), with more made in November compared to October and December. There was also a significant difference in posts made in real world group-affiliated forums (chi sq.=68.233***). Real world group forums contained more posts in October and December, though 76.2% of all posts made in November appeared in unaffiliated forums.

There was some difference in posting behaviors during the period of observation associated with the Frazier Glen Miller incident. There was a slight increase in posts made from March (n=124) to April (n=134), though there was a substantial decline in the month of May (n=69). There were no significant differences observed in posts associated with any of the measures associated with the ideological measures noted in the Objective 1 analyses. There was, however, a significant difference in posts appearing in forums with real world group ties ($x2=23.323***$). In general, the number of posts appearing in real-world group affiliated forums increased from 49.2% in March to 75.4% in both April and May.

There was a significant difference in movement-related signatures or images appearing in posts, with a substantial increase noted from March through May. In fact, 94% of all posts in May involved a movement-related signature or image ($x2=13.691**$). There were also significant differences observed in posts from users with movement-related usernames ($x2=23.690***$). There was a significant increase in posts from users with movement-related names from March (33.9%) to April (63.4%), though they decreased in May (42%). There was also a significant difference observed in anti-African American sentiment ($x2.=7.403*$), which decreased across the period of observation from 11 in March to none in May.

Jihadist Violence

There was some variations in posting behaviors associated with the period of observation around the Boston Marathon bombing. There was an increase in posts made from March (n=246) to April (n=273), with the same number of posts observed in May as well. There was a significant difference in conspiratorial posts ($x2=7.883*$), with an increase from nine in March to 19 in April, though it decreased to six posts in May. Anti-government posts also increased from March (n=2) to April (n=8; $x2.=7.417*$). Participation posts were significantly different

(x2=6.211*), though they decreased from five in March to two in April, to zero posts observed in May.

There was a significant difference in anti-immigrant posting (x2=7.643*), which appeared in four posts in April, with no posts in March or May. Additionally, there was a significant difference in anti-Islamic posts (x2=12.451**), with only one post made in March, 17 posts in April and 12 in May. There were no differences observed in the other ideologically associated posting categories during this period of observation.

Interestingly, there was a significant difference observed in posts made based on the group affiliation of the forum (x2=9.693**). While more posts were observed in real world-group affiliated forums in March (56.5%), there were more made in unaffiliated forums in April (57.1%) and no difference in May.

The 2012 Election

Posting behaviors during the 2012 election demonstrated a spike in posts made from October (n=233) to November (n=257), though posting rates returned to a generally lower point in December (n=238). A general and statistically significant difference was observed in xenophobic posts was observed during the period of the election from October to December. No statistically significant differences were observed in anti-government, anti-tax, survivalist, anti-gun control, participatory events, anti-African American, Latino, immigrant, Jewish, Catholic, Islamic posts.

There was a significant difference in self-claims of group affiliation, with three posts made in October, four in November and 14 in December (x2=11.374**). Posts with self-claims were also significantly more likely to appear in forums associated with real world groups during this period. Movement-related signatures also increased across this period, moving from 142 posts in October, to 180 in November, and 200 in December (x2=20.151***). Movement-related usernames also had statistically significant differences across the period of observation. An increase was observed from 112 posts in October to 136 in November, though posts decreased in December to 82 total (x2=18.037***). There were also significant differences observed between posts made in forums associated with real world groups or general interest communities throughout the period of observation (x2=9.201*). In fact, 61.9% of all posts made in November appeared in real-world group related forums compared to general interest groups.

Summary

Synthesizing these findings, there were no consistent trends identified in posting behaviors related to violent incidents by far right actors. The fact that there were significant differences associated with conspiratorial, anti-Islamic and anti-immigrant posts around the Boston Marathon bombing is instructive. It may be that jihadi violence or major disruptive events draw great responses from far right groups relative to their own actions. The same appears to be true for the 2012 election, as there was an observed increase in posts during the month of the election, and increases in overt signs of individual ties or associations to far right movements through self-claim posts, movement related signatures and usernames. It is possible these trends reflect a greater impact of events external on far right movement behaviors online. More research is needed as the small sample of forums included in this data set may partially account for this issue.

IMPLICATIONS FOR CRIMINAL JUSTICE POLICY AND PRACTICE

The findings of this analysis have a number of implications for policy and practice in the United States. The expression of ideological beliefs in the far-right forums encompassed a variety of specific beliefs, including gun rights, conspiracy theories, hate based sentiments, and anti-government beliefs among others. These beliefs were not equally discussed across the forums, though Anti-African American sentiment was more common compared to other ideological beliefs. In this respect, we found only partial support for traditional metrics to assess ideological involvement compared to real world measures (Kerodoal et al., 2016). It may be that the distributed nature of online environments used by far right groups enables a diffusion of ideological agendas (Rid, 2013). As a result, there may be a smaller proportion of all extremist beliefs observed in forums, especially in those with no overt association to real world groups.

The findings related to the ideological expression of users over time demonstrated that participants were to some extent more ideological over time. There was some association observed between a social learning process and increases in ideological expression. Those with greater associations with others and reinforcement from other forums were more likely to be more radical over time. Thus this analysis provides support for the notion that involvement in ideological communities may play a key role in radicalization (Bowman-Grieve, 2009; De Koster & Houtman, 2008; Hale, 2012; McCauley & Moskalenko, 2008). Additionally, this stud provides initial support for the notion that criminological theories have the potential to account for radicalization and extremist behavior (Borum, 2011; Freilich & LaFree, 2015)

At the same time, some who did not have exposures to others through interactive communication were more likely to be more ideologically expressive. As a result, these findings support the notion that radicalization processes may vary (e.g. Hamm, 2017; Holt et al., 2018; McCauley & Moskalenko, 2008). Individuals may choose to participate in forums as a means to simply express pre-existing beliefs rather than have their beliefs change as a function of participation in an online community. Thus, this study demonstrates the need for substantial empirical investigation to assess the factors associated with radicalization. In fact, this study only considers the potential for ideological expression in online spaces, but not the potential for physical violence off-line. Diverse data is needed to assess the factors that compel an individual to go beyond online expression to act on their beliefs (Borum, 2011; Freilich & LaFree, 2015).

These variations could have implications for countering violent extremism (CVE) strategies. Recently, some CVE programs have used targeted messaging campaigns to reach the general population or certain communities (Gotsch, 2017, Sumpter, 2017). These campaigns used a variety of tools to promote their message, including print, television, and radio, as well as social media and online campaigns (Romaniuk & Fink, 2012). Doosje, van Eerten, & Colert (2017) explain that some campaigns undermine specific jihadist allegations, explain why they are incorrect and also highlight the positive actions (e.g., humanitarian relief interventions after natural disaster) governments have taken. Additionally, a number of governments, including the U.S., have instituted programs challenging ideological arguments justifying the use of violence (Walker, 2017). While most of these programs have targeted jihadists, many claim the same strategies could also effectively target other extremists, like far-leftists or far-rightists (Koehler, 2017; Simi et al., 2017). Since resources are finite, it may make sense for these programs to challenge each movements' most salient and powerful claims. Thus, these programs may want to draw upon our findings, and similar studies, to help identify the most fertile and pressing far-right beliefs and thus may be deserving of more attention from the CVE messaging campaign.

Our project also provided insights into technology use. Though there jihadists are pursuing more technologically sophisticated communications platforms and methods to conceal their actions (Weimann, 2011), this analysis found far right actors were more interested in general technology discussions.   There was some discussion about encryption tools and methods, as well as Tor, Internet Service Providers (ISPs) and social media providers, and law enforcement actions to surveil illicit activities online. Thus, far right groups appeared more interested in defensive actions, rather than sophisticated schemes for radicalization or offensive actions such as criminal cyber-attacks (see also Holt & Bolden, 2014; Holt et al., 2019).

In addition, the limited evidence of technological sophistication among far right groups in the wake of the Charlottesville, VA protests (Gibbs, 2017) suggest they may feel little impetus to transform their communications strategies. Consistent monitoring of the online platforms used by far right groups and their communications is vital to identify any potential shifts in practice. In fact, it may be that the far right's technological capacity is more limited than other extremist movements (see Holt et al., 2019; Weimann, 2011), thus there technological engagement will be more superficial. Future research must systematically examine these technological issues across extremist ideologies to better assess their overall technological capacities. In addition, it will be important to explore whether there might be other places where more offensive cyber-strategies are discussed or technological expertise shared.

The social network analyses suggest that far right forums have very low network density, suggesting that there is a degree of information recycling between key actors. The redundant connections between actors may slow the spread of new information between the key participants. As a result, these forums may be inefficient at the distribution of new knowledge, due to their relatively insular nature. They may also be generally difficult to disrupt as the participants' language and behaviors are reinforcing and create a sort of echo-chamber. These networks are similar to others observed in computer hacker communities (Hetu & Dupont, 2012) and data theft forums (Holt et al., 2016), suggesting there may be consistencies in the nature of online dialogue regardless of the content of the discussions.

There are several key limitations of this analysis that must be noted. First, the results provide insights only on radical far-right groups, requiring further study to assess the behaviors and communications styles of jihadi and far-left groups. Second, the way that data was collected may limit its applicability to the current technology landscape of far-right groups. Thus, further study is needed to understand the ways that technology use changes with social responses to their activities on and off-line. Since ideological groups' tactical and strategic activities evolve, it is vital to identify how enforcement and prevention strategies lead to adaptations by extremists. Indeed, this raises a point that the far-right movement's beliefs and strategies are not static but evolve over time, as with all forms of crime. Assessments are needed that not only account for offenders' adaptations and responses to online prevention efforts, but also seek to anticipate, and predict online adaptations before they occur (Holt & Bossler, 2016; Newman & Clarke, 2003*).* This would obviously have major crime prevention benefits, as the design against crime (DAC) movement as demonstrated in combatting product theft (Ekblom, 2011). Natural language and machine learning analyses could also prove beneficial given the massive datasets that can be developed from forums and social media platforms generally (e.g. Bouchard & Nash, 2015; Ducol et al., 2016; Scrivens et al., 2018).

The observations of real world violence relative to online posting behaviors was useful to demonstrate the potential factors affecting online communications. The majority of far right activities appeared to make no impact in online spaces, while jihadi violence and the election

generated more of a response. This small sample of incidents demands further research to identify the extent to which these patterns are consistent across incident types. Additionally, these results suggest there may be value in increasing CVE messaging in online spaces whenever an act of violence may occur in order to help potentially minimize the likelihood of retaliatory violence. For instance, increasing CVE messaging related to far right groups in the wake of jihadist violence to minimize hate crimes or counterproductive violence and threats.

The findings from the ideological and social interaction analyses demonstrated that the peak of radical messaging occurred before 2009, with a reduction over time. This may partially account for difference in the extent to which radical messaging appeared around far right acts of violence generally. Additionally, these findings coupled with the notion that some individuals participated in the forums to express pre-existing ideological sentiment, may help account for the lack of evidence observed with regard to physical violence. It may be that far rightists who plan on committing violence are not likely to post as heavily in forums. Recent research on the concept of self-radicalization suggests individuals may differ in the extent to which they require direct contact with others to act on ideological beliefs (Hamm, 2017; Hamm & Spaij, 2017; Holt et al., 2018). Some individuals may self-select to engage in violence, and so their involvement in forums is ancillary to their actual acceptance of violent ideas (McCauley & Moskalenko, 2014) Further research is needed to understand the extent to which forum communication is a critical factor in radicalization or simply a potential pathway toward ideological belief (McCauley & Moskalenko, 2014).

Finally, significant differences observed in the expression of conspiratorial, anti-Islamic and anti-immigrant posts around the Boston Marathon bombing reinforce the notion that far-rightists see Muslims in general and jihadists in particular as a threat. Certain far-rightists view America as a historically Christian nation that is under siege due to changing demographics, as well as external enemies, like Al Qaeda or ISIS. Major acts of jihadist violence that cause many casualties and/or strike at iconic targets, may make these far-right worries more concrete. This may further bolster these far-rightists antipathy toward Muslims and their belief in conspiracy theories. Future research is needed to identify the underlying causal processes and mechanisms at play in order to better understand the dynamics shaping attitudes toward radical ideologies among far right groups.

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At present the project has produced seven research presentations:

Chua, Yi Ting, Thomas J. Holt, Steven Chermak, and Joshua Freilich. (2018). The Radicalization of Opinions in Online Far-Right Extremist Web Forums. American Society of Criminology Meetings, November 15, 2018.

Holt, Thomas J., Joshua D. Freilich, and Steven M. Chermak. (2017). Examining the technology use among participants in multiple online far right communities. American Society of Criminology Meetings, November 17, Philadelphia, PA.

Cohen, Shuki, Joshua D. Freilich, Thomas J. Holt, and Steven M. Chermak. (2017). "It's not racism if it's a fact." Dissemination of ideological hate in a popular far right online forum. American Society of Criminology Meetings, November 15, Philadelphia, PA.

Chua, Yi Ting, Thomas Holt, Joshua D. Freilich, and Steven M. Chermak. (2017). Understanding changes in beliefs among members in online extremist web forums. American Society of Criminology Meetings, November 15, Philadelphia, PA.

Holt, Thomas J., Steven M. Chermak, and Joshua D. Freilich. (2016). Preliminary Findings. NIJ Program Status Meeting of the Domestic Radicalization to Violent Extremism, December 5, 2016, Washington D. C.

Holt, Thomas J., Joshua D. Freilich, and Steven M. Chermak. 2016. Assessing the presentation of ideological messaging in extremist web forums. American Society of Criminology Meetings, November 16, 2016, New Orleans, LA.

Diaz, Alejandro R, Jongeun Choi, Thomas J. Holt, Steven Chermak, and Joshua D. Freilich. 2016. Data-driven system identification of the social network dynamics in online postings of an extremist group. International Conference on CyberCrime and Computer Forensics, June 13, 2016, Vancouver, BC, Canada.

Holt, Thomas J., Steven M. Chermak, and Joshua D. Freilich. 2015. Assessing the technological capabilities of participants in Far Right extremist web forums. American Society of Criminology Meetings, Wednesday November 18, 2015, Washington, D.C.

The project has produced four papers:

Cohen, Shuki, Thomas J. Holt, Joshua D. Freilich, & Steven M. Chermak. 2018. "Invisible Empire of Hate": Implicit ideological justifications for violence and hate in a female Ku Klux Klan online forum." Violence and Gender 5(4): 209-225. DOI: 10.1089/vio.2017.0072

Holt, Thomas J., Joshua D. Freilich, Steven Chermak, Colleen Mills, and Jason Silva. 2019. "Reconsidering the Social Organization of Terror and Extremism: An Application of Best and

Luckenbill's Framework to "Loner" Terrorists." Forthcoming in American Journal of Criminal Justice 44(1): 83-105. DOI: 10.1007/s12103-018-9439-5

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Diaz, Alejandro R, Jongeun Choi, Thomas J. Holt, Steven Chermak, and Joshua D. Freilich. 2016. "Data-driven system identification of the social network dynamics in online postings of an extremist group." International Conference on Cyber Crime and Computer Forensics, June 13, 2016, Vancouver, BC, Canada.

A book chapter is also forthcoming:

Holt, Thomas J., Joshua D. Freilich, and Steven M. Chermak. Legislation specifically targeting the use of the Internet to recruit terrorists. Forthcoming in Online Terrorist Propaganda, Recruitment and Radicalization, John R. Vacca, CRC Press.

This project has produced an article on The Conversation:

Holt, Thomas J. 2016. "'Burner' phones, social media and online magazines: Understanding the technology of terrorism." *The Conversation*, April 28, 2016.