Fake News, Real Threat: Understanding and Spreading Awareness about the Role of Fake News in Politics

An Interactive Qualifying Project (IQP) Submitted to the Faculty of
WORCESTER POLYTECHNIC INSTITUTE

In Partial Fulfillment of the Requirement for the
Degree of Bachelor of Science

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March 6, 2020

Abstract

With the rise of social media as a tool for people to project their opinions and ideas on anything they want, fake news and the spread of false information has increased. Fake news has become especially problematic in politics. People skew the truth to fit whatever political ideology they believe in. News is no longer about fact versus fiction but a battle about individuals' beliefs. With growing tension and the United States becoming more divided, this project worked to further analyze fake news in relation to politics and social media. This was broken into four parts. First, we reviewed literature to evaluate the current methods for combating fake news. Second, we conducted a study of general Twitter users to understand their perceptions about fake news in politics and to determine what factors affected people's trust in news, specifically truthfulness, political orientation, and tweet verification. Third, we conducted a second study to better understand Twitter fact checkers' experiences and perceptions about fake news in social media. Lastly, we compiled all the data from the first three parts in order to build a website; this was done to spread awareness and educate people about fake news and the results of our project. Our project found that people are more likely to trust liberal information and information from verified Twitter accounts. It also found that people are more receptive to being fact checked when fact checkers address the inaccuracies in direct messages instead of public posts.

Acknowledgements

Our IQP would not be successful without the following people helping and assisting us:

- All 190 Amazon Mechanical Turk users who filled out our Twitter User Qualtrics survey

- The 15 Twitter Users who filled out our Twitter Fact Checker Qualtrics Survey

- Our Advisors, Professors Kyumin Lee and Nima Kordzadeh, who assisted and guided us throughout the entire project

Table of Contents

List of Figures

List of Tables

1.0 : Introduction:

Rapid advances in technology coupled with the social revolutions the country has undergone over the last few decades has created the perfect environment for fake news to thrive in (9). Social media is a large contributing factor in the rise of fake news as it has become a platform for everyone to freely broadcast their thoughts and opinions to anyone that will listen. Unfortunately, not everyone who listens, and shares, will take the time to verify what they read and that is what fake news exploits. Homogenous social networks, much like those on many social media platforms, provide fake news a target by "[increasing] closure to information, [amplifying] attitudinal polarization, and [increasing] the likelihood to accept ideologically compatible news" (9).

The term 'fake news' in the context of our project is defined as false or partially true information often posted with the intent of misleading the viewer. The outlets that post fake news do not undergo the same procedures as credible news outlets to ensure the integrity of the information being posted, typically because the posters are pushing an agenda. Fake news can be found in many realms such as politics, the stock market, and medicine.

Fake news gained notoriety through social media, specifically Twitter, Facebook and YouTube. Through user's status updates and ad's shown much of social media was filled with misinformation, leaving the whole platform with a dearth of real news. Through a survey from the Pew Research Center, conducted in the summer of 2018, researchers have discovered that "68% of Americans get news from social media sites at least occasionally" (5), meaning that over 200 million Americans have the potential to be exposed to fake news on a daily basis. The leading contributor to online news is Facebook, with 43% of the before mentioned social media users identifying that Facebook is their main source of social media (5).

The ultimate goal of this project is to develop resources to educate the general public about the threat of fake news in presidential elections. This goal will be achieved with the following objectives:

- Evaluate public perception about the role of fake news in the past presidential election

- Determine how public perceptions about fake news have been altered for the upcoming election

- Conduct questionnaires to gather information about awareness about fake news and elections

- Contact different fact-checking websites and organizations in order to understand their perspective about the connection between fake news and politics

- Develop a website to inform people about fake news and its role in politics

The project looked into answering the following research questions:

- To what extent does political bias in some news sources add to misconceptions and therefore to the spread and belief of fake news? (Section 2.7 and 4.1.3)

- Does age play a factor in how susceptible users are in believing fake news? (Section 4.1.1)

- In what ways does the current political and social landscape perpetuate the spreading of fake news? (Section 4.1.3)

- What role does Twitter verification affect people's trust in the news they see? (Section 4.1.3)

- What motivates fact checkers? (Section 4.2)

- How can we educate people on fake news, in order to spread awareness? (Section 5.1)

2.0 Background

2.1 : Prevalence of Fake News:

Social media is one of the biggest factors that has perpetuated the spread of fake news due to user's abilities to post opinions without verifying their validity. Another contributing factor to the rise of fake news is the country's steady decrease in trust of the media. According to an annual poll by Gallup, in 2016 the country hit an all time low of 32% for trust in mass media (13). This is likely due in part to President Trump's criticism of mass media for allegedly representing his administration unfairly. The consequences of President Trump's battle against mainstream media are reflected in the poll when it is split up by political party. Notice in 2016 the nation's all time low trust in mass media corresponds with the Republican party's all time low trust and President Trump's campaign, followed in 2017 by the largest difference in trust between the two political parties.

2.2 : Impact of Fake News:

The impact of fake news has many implications, mainly in politics. One of the main instances of fake news massively impacting U.S. politics was the PizzaGate scandal (21). Many Twitter users were spreading fake news of a pedophilia scandal amongst many Democratic Party leaders, which turned out to be false. Not only does this hurt the reputations of the members, it also hurts the democratic candidates involved in elections. Political damage is not the only harm of fake news. The economy has been affected drastically, tweets from verified politicians have caused stock prices to fluctuate (15). The impact fake news can have on the United States is a serious concern, from manipulating the stock market, alleging crimes, and shaping elections this is a problem that could cause great damage.

The main worry is the impact of fake news in presidential elections, due to the mass audience social media reaches, many are left unsure of what to believe. The users who do have an opinion tend to rigidly stick to that opinion and disregard any news against their views as fake. Fake news in social media has reduced "tolerance for alternative views, boosted the likelihood of accepting ideologically compatible news, and increased closure to new information" (9). This dislike for the opposing political side has closed people's minds to news that conflicts with their partisan views. This issue is so widespread in social media that "31% of consumers of news on social media list inaccuracy as their biggest issue with it and list unreliable sources, lack of fact-checking, and fake news as the cause of their concern" (5). This is a worrying statistic especially during election time, when candidates are constantly facing allegations and voters are challenged to decipher what is and isn't true. It leaves the United States in a vulnerable position, spreading fake news becomes an unethical, yet effective strategy. Elections can be swung simply due to voters not knowing the truth, the lack of awareness to fake news in social media could have detrimental effects to the prosperity of the United States of America.

2.3 : Sources of Fake News:

Studies have shown that the majority of American use social media to get news some of the time (5). Even more important than the usage rate of social media, it is necessary to consider the rate at which news spreads. Constant access to the internet allows users to check the news 24/7. This accessibility leaves the user informed about any subject they desire. The downfall with this system is that not all users spreading news are informed and credible, thus leaving many to believe certain lies thinking of them as the truth (1).

Although much of the fake news phenomenon has been around social media, other media platforms are also to blame. People tend to think that if news comes from traditional media

sources (newspapers, radio, television), it has more credibility. However, traditional media has been affected by a different type of fake news that involves political bias. Bias has been prevalent in the media from the start, but with social media expanding these news outlets can spread their news much faster, thus reaching more people (1). This dependence on receiving news from social media has many users doubting the truth of what can be found on social media.

2.4 : User Trust in Fake News:

As a result of fake news spreading and the way different media sources have sensationalized it, most Americans are skeptical of the news they see. The Pew Research Center, conducted a survey in the summer of 2018 with 4,581 respondents from the American Trends Panel (ATP), created by the Pew Research Center (randomly chosen adults in the United States recruited by random-digit-dial cell and landline phones) (5). Fifty-seven percent of respondents said they expected to see inaccuracies when they obtained news from social media sites. However, only 15% said that the inaccuracies confused them, whereas 48% said the inaccuracies did not affect them and 36% said they actually helped them. Out of respondents that "prefer[ed]" to get news on social media, 42% doubted its accuracy. Most of the social media users listed their biggest concern with social media as inaccuracies due to "unreliable sources, lack of fact checking, and 'fake news'". However, among different sources of news, social media is believed to have the least inaccuracies (42%) compared to TV (58%), websites/apps (59%), radio (61%), and printed news (68%). The study also found that trust in different news sources varies with political ideology. Republicans were the most distrusting of news on social media (72% expected it to be inaccurate) followed by Independents (52% expected it to be inaccurate) and Democrats (42% expected it to be inaccurate).

Other researchers, such as the Reynolds Journalism Institute, have looked more specifically at American's trust in different news sources. The Reynolds Journalism Institute conducted its survey in early 2017 and collected data from 8,728 users across 28 newsrooms in the United States (8). They found that local news, Dallas Morning News, Los Angeles Times, Wall Street Journal, Guardian, PBS, NPR, BBC, Reuters, Public Television, and Economist were the most trusted news sources (all were rated above 0.875 on a scale of 0-1 of least to most trustworthy and they are listed in order of increasing rating). Occupy Democrats, Buzzfeed, Breitbart, Social Media, Trump, Infowars, and Yahoo were the least trusted news sources (all of these were rated below 12.5 and are listed in order of increasing rating). When respondents were asked how likely they were to believe mainstream journalism organizations they encounter, 67.3% reported that they are either likely or very likely. However, for this question researchers did not explicitly define what 'mainstream' referred to, instead they choose to allow respondents to decide.The researchers also found that differences in political ideologies played an important role in respondent's trust in new sources, as seen in the survey done by the Pew Research Center. Liberals were far more trusting than conservatives. They noted other trends about how age did not affect trust, but that whites and females were more likely to trust news sources than non-whites and males.

2.5 : Current Methods for Combating Fake News:

Due to the prevalence of fake news and the media spotlight it has, many companies such as Facebook have started working to minimize the spreading of fake news. Since 2016 Facebook has employed a three step plan for evaluating information on their site (7). The first step (remove) deals with information that goes against their policies such as information that harms people or groups of people. Steps two and three (reduce and inform) focus on misinformation.

In order to reduce the spreading of misinformation, they partnered with 45 certified third-party fact checkers some of which can review videos and content in Spanish. They also reduce feed distribution from groups that consistently spread false information, as determined by fact checkers. As part of step three, they are working to inform users about source credibility. They added a "Context" button for articles, which shows the publisher's Wikipedia entry, website's age, and where and how content is shared. The "Context" button also shows the "publication's fact checking practices, ethical statements, corrections, ownership, funding, and their editorial team". Along with informing users, Facebook is working to better inform page owners. Page owners get information about their page quality, which lists what posts were removed, or rated as false, mixture, or false headline. Facebook is also currently working to give users the ability to remove their own posts or comments from groups even if they are no longer a part of those groups.

As mentioned above, Facebook has formed many partnerships with fact checking companies. Facebook assigns fact checkers a queue with posts that Facebook's algorithm has marked as concerning (the exact details of how this algorithm works are unknown) (6). For each post in the queue, Facebook tells fact checkers the number of shares, post date, and number of users who flagged it. Fact checkers must then rate the post as false, mixture, false headline, true, not eligible, satire, opinion, prank, or not rated. Anything rated as false in some way gets an article disproving it and its rating attached. Facebook minimizes the spread of these posts and people who want to share it are notified with its rating and the link to the article disproving it before they can post it.

One of Facebook's fact checkers is Full Fact. Full Fact is a UK fact checking charity that started its partnership with Facebook in January 2019 (6). In the first six months of its partnership with Facebook, it checked 96 posts (all the posts were reviewed by multiple fact

checkers). Of these posts, 59 were rated as false, 19 as mixture, 7 as opinion, 6 as satire, and 5 as true. Full fact often collaborates with experts in different fields and other Facebook fact-checkers in order to better evaluate and assess posts.

YouTube has also implemented tools to aid in the identification of fake news in order to minimize its spread (14). In the summer of 2018, they made more credible sources of news higher priority so that they appear at the top of search results. In early 2019, they added a disclaimer for videos with sensitive topics when people search for them (however, it does not fact check specific videos, just the search terms). It is available for some users in India and it "works for searches in English and Hindi" (India is one of YouTube's largest markets). They have also made plans to make it available for users world wide in the near future.

Some researchers have devised tools and methods to combat the propagation of misinformation. Researchers at Alexandru Ioan Cuza University created a system to identify the credibility of tweets and their source (3). Their system works by using a database of trusted tweets and an algorithm to break apart tweets into important parts (ie. nouns, topics, hashtags). Tweets are analyzed using this algorithm and compared to other tweets in the database. From this, tweets are assigned a score based on how trustworthy/true they are as a result of their similarity to tweets in the database. A tweet receives a score of -1000 if there is an error in analyzing it, -500 if there are no parts of the tweet that the algorithm can recognize or if there are no similarities to the database, between -50 and 0 if there is only one source found, between 0 and 50 if it is false, and between 50 and 100 if it is true. This allows individuals to copy the link of a tweet into this system and receive information about its credibility and the credibility of its source.

2.6 : Problems Faced by Current Methods Combating Fake News

Full Fact's Third Party Fact Checking Program with Facebook is a good partnership but it does not come without flaws. In their report about the program, Full Fact included a section called, 'Specific Topics of Interest' in which they address topics that were challenging to fact check. Health is a topic that can be problematic for fact checking because it is often hard to find a source for health related claims. Full Fact's in-house fact checkers do not have the medical expertise to address every health related claim that is posted. Similar problems emerge with claims involving crime. With little to no evidence supporting a claim it is hard to get information from the police.

In 2016 Facebook experimented with tags on posts to indicate their credibility (12) . A post would receive a 'Disputed' tag if it was suspected of being false or spreading misinformation. This experiment came to a quick halt when it was revealed that the tags turned out to be counterintuitive. It turns out that by adding the flags to some posts, but not all, a phenomenon called the 'implied truth effect' emerged in which people believe a post is credible simply because it isn't tagged as otherwise.

As mentioned above, YouTube has taken steps to try to decrease the spread of fake news on their platform by adding a warning of fake news when search results appear. Unfortunately, the warning does not filter out videos that contain fake news or misleading titles from the search results.

Susceptibility to fake news, when it comes to the subject of politics, can destroy the democratic process as we know it. This issue demands a solution. However, one cannot address the problem of susceptibility without addressing the problem of awareness, or lack thereof. Awareness enables people to take in information, think critically about it, and make a decision

15

on whether or not to trust it. By increasing awareness of what fake news is and how to identify it we hope to decrease people's susceptibility to fake news and increase the spread of the truth.

2.7 : Education as a Method for Combating Fake News

The United States has undergone a shift in political culture that has resulted in what is currently known as 'post-truth politics'. In post-truth politics debates, an integral part of the democratic election process, are geared more towards appealing to the feelings of voters rather than explaining the minutiae of policy. In March of 2018 the Open Society Institute - Sofia conducted a Media Literacy Index to determine the resilience to the post-truth phenomenon across 35 European countries (23). The highest score on the index, 76, was achieved by Finland. This is no surprise given the huge initiative the Finnish government took to identify and understand fake news and misinformation after their President Sauli Niinistö acknowledged it as a real problem back in 2015. After coming to the realization that education is one of the most effective ways to combat fake news, Finland reformed their curriculum to include education on disinformation, as well as other topics not traditional cover in school. This effort did not stop at the level of educating children, classes to educate adults were also offered. Evidently from the results of the Media Literacy Index Finland's push to combat fake news has been effective and will hopefully shed light on the benefits of fake news education (23).

An article from North Carolina State University discussed the need to better educate adults and the elderly about fake news and online scams (16). The elderly are one of the most vulnerable populations when it comes to fake news or online scams. In 2016, 55,043 cyber crimes were committed against people over sixty years old, followed by 54,670 for people in their thirties, 51,394 for people in their forties, and 49,208 for people in their fifties. However, according to the FBI, the number of cyber crimes for people in their sixties is an underestimate because most elderly people feel ashamed about falling for a cyber crime and "do not want

family members to think their mental capacities are declining". However, little is being done to support this vulnerable population against online scams and fake news. A study from the University of Michigan and Georgia State University found that directly trying to combat misinformation can be ineffective if a person already believes it (17). They ran a few experiments where they provided people with articles that contained a false claim and a correction. They found that the corrections were usually ineffective at persuading people of the truth. In some cases, adding corrections for the misinformation backfired and made people believe the misinformation even more. The article from North Carolina State University suggests that due to the backfire that results from trying to correct misconceptions, researchers should work to educate people more about identifying fake news (16). Especially for adults and the elderly, little research has been done on methods to better educate and inform adults about identifying misinformation or online scams.

One of the few examples of combating fake news through education has been pursued by the librarians at Indian River State College. (IRSC) They developed a discussion guide to teach their students how to identify fake news, as well as what questions to ask when reading (18). This discussion guide took the length of an hour and a half long class that showed students the tell tale signs that are apparent in unreliable articles (19). Paired with this discussion guide, the librarians also made a tutorial that included 5 websites. This tutorial would guide you along the way to learn whether the article was fake or not. Questions included asking; what are the author's credentials? Is the information up to date? Is the article purposefully trying to invoke an emotional response? (20) Using these questions and the discussion guide the librarians noticed that many students were beginning to understand the difference between reliable and unreliable news. They even administered pre and post tests that showed the students improvement (18). However, the scores themselves were not posted.

Although what the librarians did at IRSC was beneficial to the student body, not everyone has the time and patience to sit through a lecture. That is why our goal is to produce a product that is easy, quick, and helpful for all age groups. We plan on conducting a few studies on the general population and fact checkers to evaluate the current public awareness about fake news. We will then use this information to develop a website with resources specifically designed to target gaps in the population's awareness about fake news or ability to detect fake news. By doing so we hope to educate many more people on identifying fake news.

3.0 : Methodology:

3.1 : Objectives:

In order to address the research objectives, we conducted an experimental study and a survey study and used the information from the studies to increase public awareness about fake news. The experimental study served as a method to better understand current public perceptions about fake news in the United States and how they changed since the previous presidential election; this also included a tweet experiment to identify what factors affect people's trust in news. The survey study was used to better understand Twitter fact checkers' and journalists' perceptions and experiences with fake news and how its prevalence changed since the previous presidential election. For the purpose of this survey study, a Twitter fact checker was defined as a Twitter user who has posted a fact checking link on a false tweet. The data from both studies was analyzed and used in developing a website to increase public awareness about the impact of fake news and how to identify it.

3.2 : Experimental Study - General Population:

3.2.1 : Goals:

The goal of the experimental study was to evaluate public perceptions about fake news in social media during presidential election campaigning and voting, and to better understand what factors influence a person's trust in news (see Section 8.2 for the full survey). It was broken up into two parts. The goal of the first part was to assess the extent that true versus false tweets, Twitter verified versus unverified tweets, and conservative versus liberal tweets impact a person's perceptions about the truthfulness and reliability of the tweet. The topics for these tweets were found by searching for true, false, or 'pants on fire' ratings of statements on the fact checking website PolitiFacts. The twitter account names and profile pictures were blurred and pictures, the number of retweets, likes, and shares were cropped out. This was done to prevent variables other than the content itself from being judged. Overall, this data was used to better understand what makes people trust different news sources and to determine how closely public perception of fake news matches the actuality of the situation.

Sixteen tweets were selected from real Twitter accounts that match the combinations formed by the previous mentioned factors. These combinations include:

- Fake, Conservative, Verified, (FCV)   - True, Conservative, Verified (TCV)

- Fake, Liberal, Verified (FLV)   - True, Liberal, Verified (TLV)

- Fake, Conservative, Unverified (FCU)   - True, Conservative, Unverified (TCU)

- Fake, Liberal, Unverified (FLU)   - True, Liberal, Unverified (TLU)

Of the sixteen selected tweets, two tweets matched each combination. During the experimental study, conducted on Qualtrics, the software randomly picked one of the tweets that matched each combination. In doing so, each participant was presented with a random assortment of the eight tweet types.

Participants were asked to rate the political party, and their perceived truthfulness, and perceived reliability of the tweets*, along with their familiarity with the topics discussed. Also, in order to test if the respondents were actually reading the questions, there was an attention tester tweet. This tweet appeared near the middle of the section and asked participants to select specific responses listed in the tweet. Anyone that selected something other than the requested responses had their questionnaire session terminated.

*Note: Respondents were asked to rate the perceived truthfulness and reliability of the tweets; any further references to these ratings will be referred to as truthfulness and reliability ratings.

For each aspect of the tweet that respondents were asked to rate, a bar graph was generated to determine how many of the respondents were correct with their ratings. These graphs were used to identify general trends in the data. From there, two-sample t-tests assuming unequal variances were performed. The data was first broken into true versus false tweets, liberal versus conservative tweets, and unverified versus verified tweets. The respondents' truthfulness and reliability ratings for these tweets were compared with t-tests. The tweets were further broken down as follows:

Verified vs Unverified:	Conservative vs Liberal:	True vs False:
-Liberal	-Verified	-Verified
-Conservative	-Unverified	-Unverified
-Verified	-True	-Liberal
-Unverified	-False	-Conservative

For the twelve categories listed above, t-tests were used to compare respondent's truthfulness and reliability ratings. For example, the truthfulness of conservative verified tweets was compared with the truthfulness of conservative unverified tweets.

The second part of the study was a series of short answer and multiple choice questions to get background on the participant's experiences with fake news and their beliefs on its impact in politics. The short answer questions were as follows:

-ESQ1: How do you define fake news?

-ESQ2: Why do you think the prevalence of fake news has changed?

-ESQ3: In the space below, please write 3-5 sentences to explain what you did to combat fake news during the 2016 presidential election.

-ESQ4: In the space below, please write 3-5 sentences to explain what you did to combat fake news during the 2020 presidential election.

For each question, themes were generated based on the responses in order to interpret the data more easily. Frequencies for the response themes were calculated and themes with a frequency below 5 were grouped into a theme called 'Other'. The 'Other' theme also contained empty answers, nonsense answers and political rants. For each question a table was generated containing the themes for the responses, the frequency of the themes, and an example of a response that fits under each theme (see appendix).

3.2.2 : Sample:

In order to obtain the most diverse and representative sample possible with the current resources, the experimental study was posted on Amazon Mechanical Turk. The project aimed to acquire experimental study responses from people with a variety of political orientations and from various age groups. A total of 190 usable responses were collected and analyzed from this site. Since there were 2 tweets for each combination of variables, and 8 total combinations, there

were $2^8 = 256$ potential versions of the questionnaires available. The responses were analyzed

before being accepted to avoid unusable responses. Responses were not accepted if they

contained more than 2 unanswered short answer questions, if they failed any of the five questions

attached to the attention tester, or if they said they use Twitter less frequently than once a month.

3.3 : Survey Study - Fact Checkers and Journalists:

3.3.1 : Goals:

The purpose of these survey studies was to gain a better understanding of the experience

of independent fact checkers on Twitter and fact checking journalists on fact checking sites such

as Snopes or PolitiFact (see Sections 9.4 and 9.5 for the full surveys). The first goal was to

understand the fact checkers' and journalists' reasoning for researching fake news. Second, was

to grasp the severity of fake news in social media in terms of the current election and past

elections. Third, was to educate the public about fake news and raise awareness about it. Data

from these surveys will help drive content production for

3.3.2 : Sample:

The list of independent fact checkers that were contacted was generated from previous

research (21). In order to generate the list, 'fact checkers' were defined as Twitter users who

were actively fact checking within the three months prior to creation of the list. Within the list of

fact checkers there was a metric that measured the amount of fact checking activity the user had

in the three months prior to generation of the list. In order to gain insight from a diverse group of

fact checkers we contacted fact checkers ranging from very little activity, posting fact checking

links or responses on 1-3 tweets, to very frequent activity, posting on 100+ tweets. The survey

was distributed through Twitter's direct message feature. The message included a short description of who we were and the research we were conducting. If a fact checker's privacy settings did not allow messages from non-followers we tweeted the survey to the fact checkers using Twitter's @mention feature. Due to Twitter's 280-character limit for tweets we created a concise version of the message to be used when distributing the survey via @mention. The following are a few of the questions we used in the Twitter fact checker survey:

FCQ1: What motivates you to fact check on Twitter?

FCQ2: How do you choose the tweets you fact check?

Short answer responses on this survey were analyzed with the same method described in section 3.2.1.

The journalist fact checkers were chosen from prominent fact checking websites and fact checkers were chosen so that all sides of the political spectrum were represented in the sample. A total of eighteen fact checking journalists were contacted. Depending on how much contact information was provided by the journalist fact checking websites, the journalists were either contacted via email or online contact form. Regardless of the method of contacting them, we sent a short message that included a short description of who we were and the research we were conducting along with a link to the survey on qualtrics. The journalists were contacted first on November 11-13th, 2019 and again on November 24th, 2019.

3.4 : Increase Awareness - Develop a Website:

3.4.1 : Goals:

Our project emphasized the importance of education in the war against fake news so we decided that a website was an effective medium through which to spread our message. Our website has six sections: a welcome page (home page), 'Background for Study', 'Tweet Experiment', 'Twitter Fact Checker Survey', 'Additional Resources', and 'About Us'. Our welcome page provides an overview of our project and a definition for fake news accompanied by a list of common terms related to fake news. Content creation for the sections 'Tweet Experiment' and 'Twitter Fact Checker Survey' was guided by the analysis of the results for the survey study and experimentally study. The 'Additional Resources' will house helpful graphics we found during our research and the bibliography for this report. Finally the 'About Us' section explains who we are with a picture and a small description for everyone in the research group.

3.4.2 : Intended Audience:

Generally the intended audience is the average literate American with access to the internet because one of our goals is to reach as many people as possible. Our blog includes easy to read infographics and short paragraphs with simple diction so all ages will be able to take advantage of the resource. Another more specific group we are targeting is Americans that will be of voting age come the 2020 presidential election. Making voters aware of the threat enables them to be vigilant and keep their defenses up when scrolling through social media. In order to ensure that the website reaches all of the necessary people we plan on using several methods to help promote. First, the plan is to share the website on our personal social media. As an added method , try to contact WPI to get either exposure on through their social media or a student

body wide email. If the traffic is still not to the appropriate level, there are many clubs and organizations on campus that reach a large population of students. For example, asking organizations on campus such as the Interfraternal Council (IFC) or Panhellenic Council to promote the website to their members. We plan to reach out to the Executive Director and Administrative Services Coordinator of the Higher Education Consortium of Central Massachusetts (HECCMA), a consortium of colleges in Worcester, MA, and ask if it is possible for the schools in the consortium to send an email to their students and staff about our website.

4.0 : Results

This section presents the results of our data analysis associated with the experimental study and survey study. We collected 190 usable responses from Twitter users as part of the experimental study. The survey study, with fact checkers from Twitter, was dispersed to approximately 200 twitter users and received 15 usable responses. The survey for fact checking journalists was sent to 40 individuals and news sites but was removed from the project because it received no responses.

4.1 : Experimental Study - General Population

### 4.1.1 : General Descriptive Analysis

The study included some background questions that were used to better understand respondents' background and ideas about fake news and social media, and their influence on politics.

Table 1: General Twitter User Study Respondent's Demographics

| Gender	
Male	54%
Female	46%
Age	
18-24	5.8%
25-34	43.7%
35-44	31.1%
45-54	12.6%
55-64	5.8%
65-74	0.5%
75+	0.5%
Political Party Orientation	
Liberal	53%
Moderate	19%
Conservative	27%

Based on the data from Table 1, the study had more liberals (53%), slightly more males (54%),

and the vast majority of the respondents were between 25 and 44 years old (74.8%). This

slightly skewed the data since political party and age are factors that can affect opinions about

politics, social media, and fake news (8).

Figure 1: Comparison of Respondents' Age to Trust in Social Media
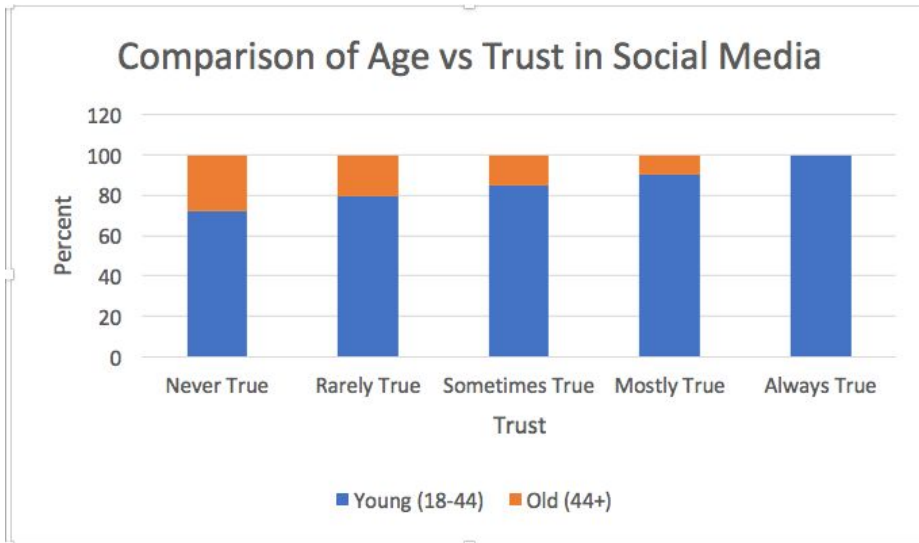
By looking at the age of the participants a cutoff of 44 years old was determined to be the point where we would distinguish between young and old participants. Young participants were 18-44 years old and old participants were 45+. The graph above shows that younger participants tend to put more trust into social media, whereas older participants tend to be more skeptical of news found on social media.

Figure 2: Respondents' Percent Trust in Social Media
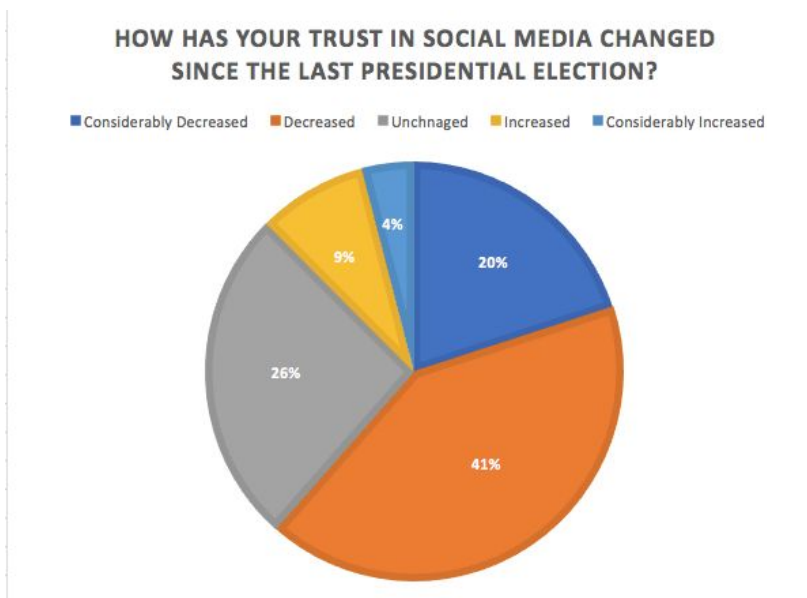
The pie chart above shows that 61% of respondents decreased their trust regarding social media news, indicating they began considering "fake news". This is also applicable to the 39% of respondents who say their trust in social media has either remained unchanged or increased.

Figure 3: Percent of Respondents' that Get News from Social Media

HOW OFTEN DO YOU GET NEWS FROM SOCIAL MEDIA?

■ Very Rarely ■ Rarely ■ Occasionally ■ Often ■ Very Often

15% | 11%
12%
33%
29%
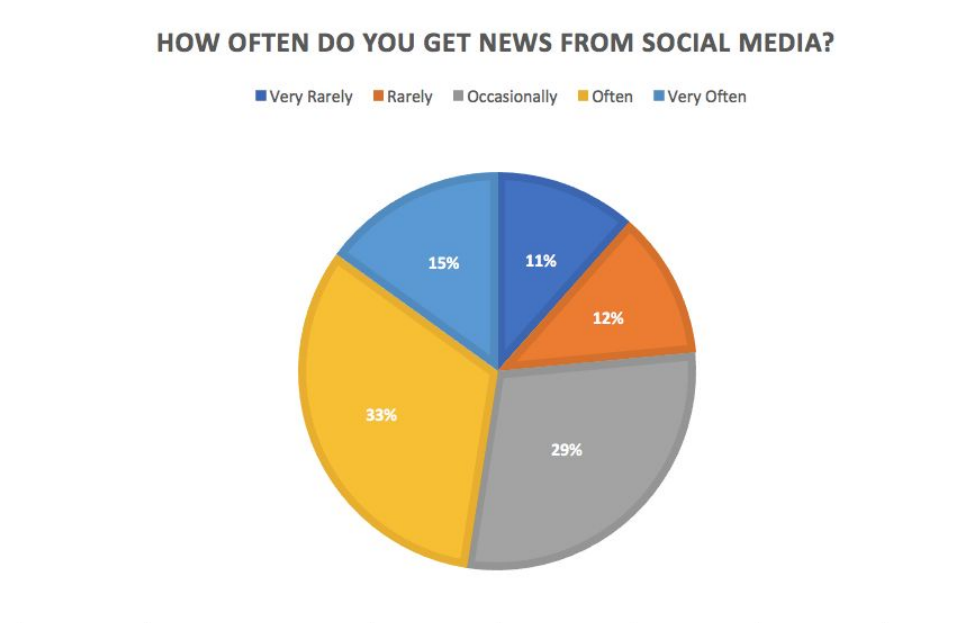
As seen in a previous graph, many of the respondents tend to not trust the news found on social media. But as this graph shows, 77% of the respondents either get their news entirely from social media or at least half of their news from social media. This creates a worrying trend where people are getting the majority of their news from potentially unreliable sources.

Figure 4: Percent of Fake News Affecting the 2020 Election

TO WHAT EXTENT ARE YOU CONCERNED ABOUT FAKE NEWS AFFECTING THE 2020 ELECTIONS?

■ Did not care ■ A little concerned ■ Neutral ■ Concerned ■ Very Concerned

9%
17%
7%
36%
31%
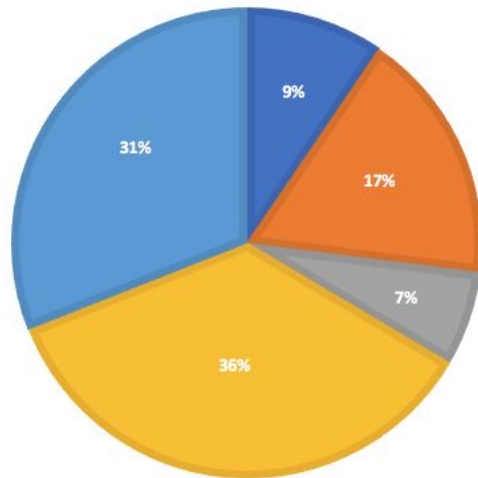
Sixty-seven percent of respondents are concerned about fake news affecting the 2020 Presidential Election. This is perfect evidence as to why an educational program on identifying fake news is so essential. People know fake news exists and are concerned with its impact in future elections. Having over two-thirds of people identify that fake news will affect the presidential election solidifies the idea that fake news is a rapid epidemic that is affecting social media at an alarming rate.

Figure 5: Respondents' Main Source of Acquiring News

Percent of Users who Acquire News from Platform
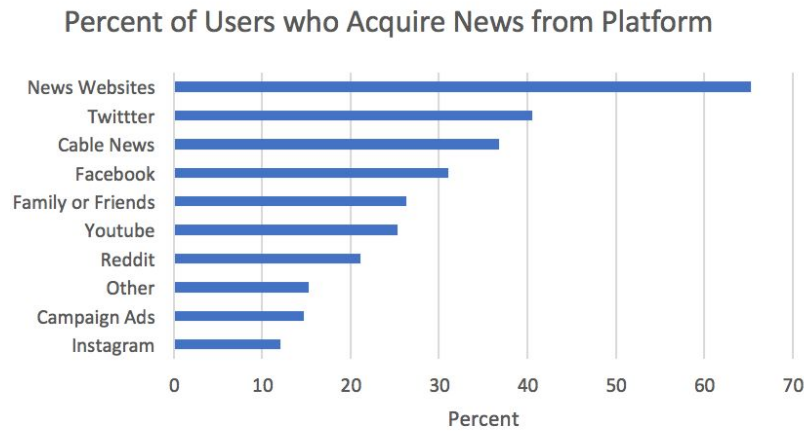
This graphic shows that social media is a large presence in terms of respondents acquiring news. Twitter leads all social media with 41% of respondents saying that they get news from Twitter. Other social media sites showed a strong presence with respondents by having Facebook (32%) Youtube (25%) and Reddit (21%) with a strong number of votes. Instagram was the only social media site to get less than 15% of the vote, which is expected due to instagram not being well known for airing many political ads. Lastly, News Websites (New York Times, Washington Post, etc.) led the poll with 65% of respondents identifying it as a platform where news is acquired.

Figure 6: Main Factors that Influenced Respondents' Votes in the Previous Presidential Election

Main Factors that Influenced Vote
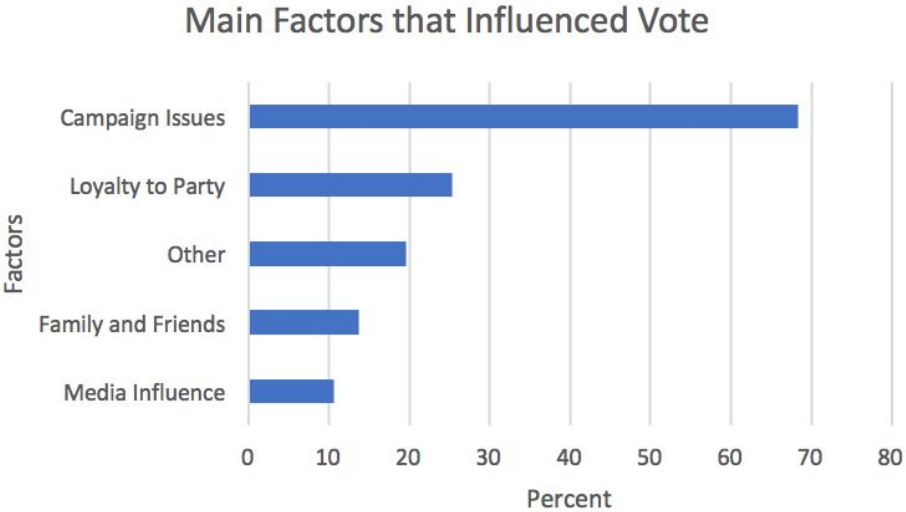
Overall, 70% of the respondents identified Campaign Issues as their primary source of concern that influenced their vote in the 2016 Presidential election. Twenty-five percent of respondents also identified loyalty to their respective political party as a main factor in influencing their vote in the election.

4.1.2 : Tweet Experiment Manipulation Check

This experiment served as a way to analyze how the general population's ideas about political parties, truth, and Twitter account verification affect their rating of the truthfulness and reliability of tweets. Eight tweets types were chosen. For each tweet type, there were two tweets and each respondent only received one tweet from each tweet type.

Figure 7: Percent of Respondents Familiar with the Topics Presented in the Tweets
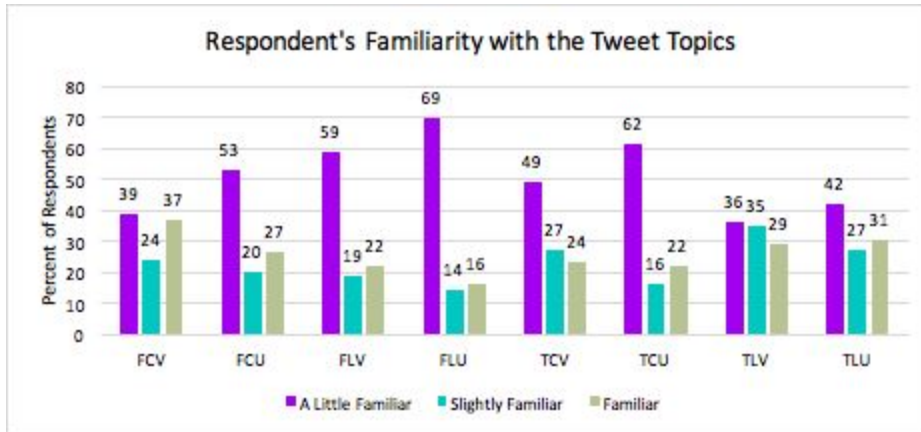
For most of the tweets, less than 30% of the respondents were familiar with the topics. Over 35% of the respondents were only a little familiar with the topics presented in all of the tweets. For tweets FCU, FLV, FLU, TCV, TCU (false conservative unverified, false liberal verified, false liberal unverified, true conservative verified, true conservative unverified) almost 50% of respondents were a little familiar with the topics presented in the tweets. On average 51% of respondents were a little familiar with the tweet topics, 23% were slightly familiar, and 26% were familiar. Therefore, for most tweets, the majority of the respondents were not greatly influenced by previous knowledge about the topics presented.

Figure 8: Respondent's Ratings for Tweet Account Verification
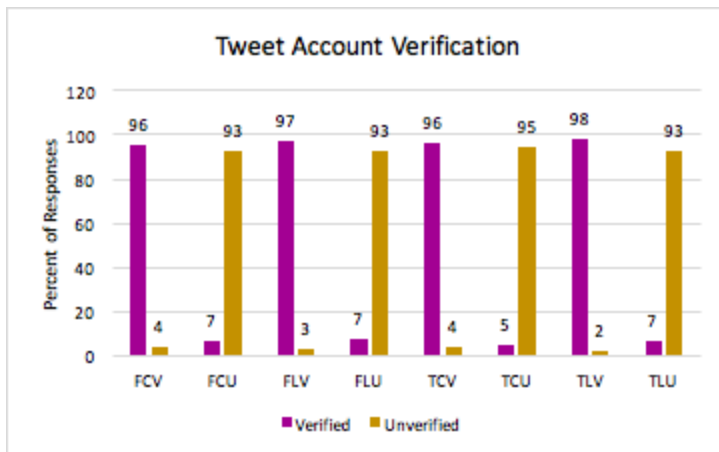
On average 93% of the respondents correctly rated unverified tweets as unverified and 97% of the respondents correctly rated verified tweets as verified. It was easier for the respondents to determine if a tweet was from a verified Twitter account than from an unverified Twitter account. This was likely due to the fact that a verified tweet has a blue check mark next to it and an unverified tweet has nothing next to it.

Figure 9: Respondent's Ratings for Tweet Political Party
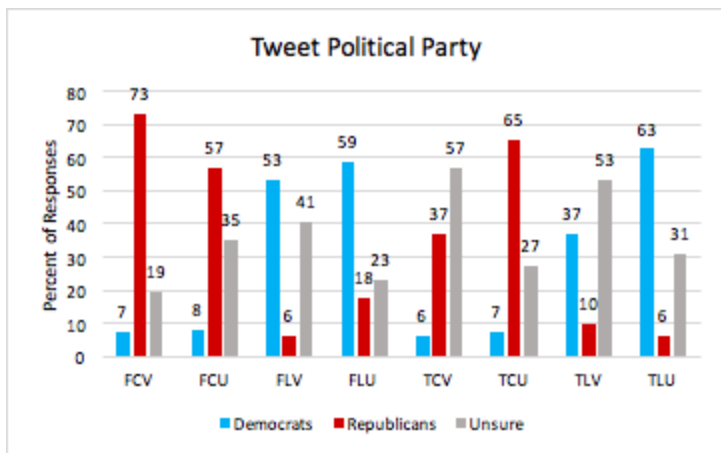
Overall, the majority (between 53% and 73% depending on the tweet) of the respondents correctly identified the tweets' favorable political parties. For TCV (true conservative verified) and TLV (true liberal verified) the majority of the respondents were unsure about the favorable political party, but out of the respondents that identified the tweets as either democratic or republican, the majority (37%) correctly identified the tweets.

Figure 10: Respondent's Ratings for Tweet Truthfulness
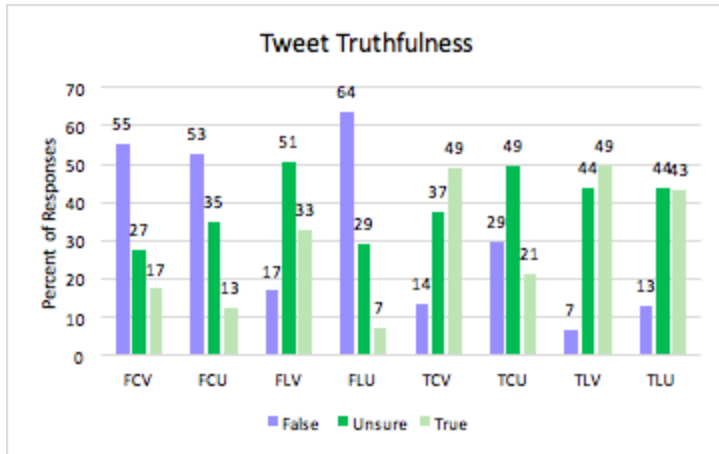
Overall, respondents correctly identified whether the tweets were true or false. However, for FLV (false liberal verified) and TCU (true conservative unverified) most of the respondents were unsure whether the tweets were true or false; out of the respondents that identified the tweets as either true or false the majority were incorrect. As seen above, respondents were more likely to rate something false as false than something true as true. On average 57% of respondents rated the false tweets as false but only 47% rated the true tweets as true. Also, for the false tweets, on average, 35% of the respondents were unsure about them and for true tweets, on average, 44% of the respondents were unsure about them. Respondents had more difficulty with tweets that were true than those that were false.

Figure 11: Respondent's Ratings for Tweet Reliability
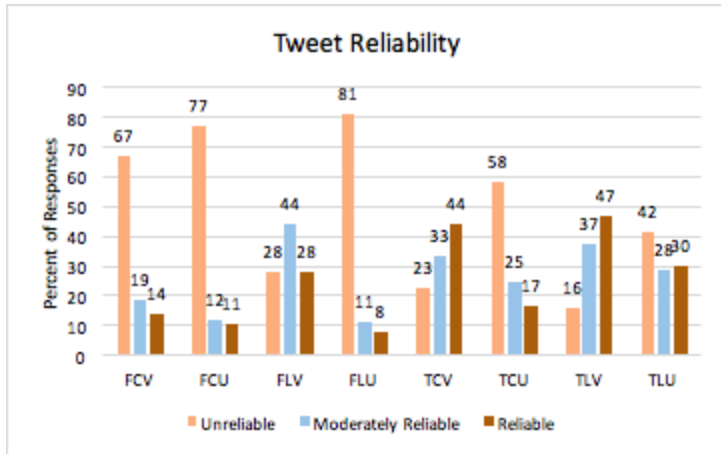
The trends seen for respondent's truthfulness ratings of tweets were also seen for the

respondent's reliability ratings of the tweets, as seen in Figure 11. However, there were greater

differences between the reliability ratings of true and false tweets than the truthfulness ratings of

those tweets. Five out of the eight tweets were correctly identified in terms of their reliability;

the reliability of FLV (false liberal verified), TCU (true conservative unverified) and TLU (true

liberal unverified) was incorrectly identified. For tweet FLV, the majority of the respondents

rated it as moderately reliable and an equal number of respondents chose unreliable or reliable.

For tweet TCU, the vast majority said it was unreliable when it was reliable. For tweet TLU,

42% said it was unreliable, but 28% marked it as moderately reliable and 30% marked it as

reliable. Overall, it was easier for respondents to mark false tweets as unreliable than true tweets

as reliable. Out of the tweets that the respondents correctly identified, on average, 75% rated

false tweets as unreliable and 46% rated true tweets as reliable.

4.1.3 : Relationships between Variables

The verified and unverified tweets were compared with two-sample t tests assuming unequal variances and this was repeated with the liberal and conservative tweets and the true and false tweets. The truthfulness and reliability ratings for each of these types of tweets were compared and described below. If there was a significant difference between tweet types for truthfulness or reliability, the average respondent rating was listed below the significant difference. For the truthfulness ratings, ratings of 1-2.5 were considered untruthful, 2.5-3.5 were considered moderately truthful, and 3.5-5 were considered truthful. We followed the same approach to categorize reliability ratings into unreliable, moderately reliable, and reliable.

Table 2: Two-Sample T Test Comparing Verified (V) and Unverified (U) Tweets

The Difference between Tweets with Verified and Unverified Accounts		
	Truthfulness	**Reliability**
False	Significant Difference V→ Moderately Truthful (2.7) U→ Untruthful (2.2)	Significant Difference V→ Moderately Reliable (2.6) U→ Unreliable (1.9)
True	Significant Difference V→ Moderately Truthful (3.4) U→ Moderately Truthful (3.0)	Significant Difference V→ Moderately Reliable (3.3) U→ Moderately Reliable (2.6)
Conservative	Significant Difference V→ Moderately Truthful (2.9) U→ Moderately Truthful (2.5)	Significant Difference V→ Moderately Reliable (2.7) U→ Unreliable (2.2)
Liberal	Significant Difference V→ Moderately Truthful (3.3) U→ Moderately Truthful (2.7)	Significant Difference V→ Moderately Reliable (3.2) U→ Unreliable (2.3)

*For any comparisons that had a significant difference between the respondents' ratings of the tweets, the average respondent rating of the verified and unverified tweets was also described.

The above table (Table 2) shows the results of t tests comparing the responses for verified tweets to unverified tweets. When the four unverified tweets were compared with the four verified tweets, there was a significant difference for respondent's answers to the questions about the tweets' truthfulness and reliability; for both truthfulness and reliability, respondents rated unverified tweets as less truthful and less reliable than verified tweets. From there, the conservative unverified and verified tweet responses were compared, and this was repeated for liberal verified and unverified tweet responses, true verified and unverified tweet responses, and false verified and unverified tweet responses.

The dark red text in Table 2 represents significant differences found when verified and unverified tweets were compared. Theoretically, whether or not a tweet was from a verified or unverified account should not affect a respondent's rating of the tweets' truthfulness or reliability. Therefore, the comparisons that showed significant differences between verified or unverified tweets represent areas of weakness for respondent's abilities to rate the tweets without being biased by the account verification.

Overall, verified tweets were trusted more than unverified tweets regardless of the truth of the tweet. It was expected that most respondents would rate unverified tweets as untruthful and unreliable compared to verified tweets due to previous research that observed this. Also, most people are taught to trust information from verified sources, so people are therefore more likely to trust information from verified tweets (even though the verification of a Twitter account does not affect the content that account distributes or the validity of the content). It was also seen that unverified tweets were rated as more truthful than reliable. Although truthfulness and

reliability should be equal, the results suggest otherwise. This trend was also seen when

comparing Figures 10 and 11 which graphed tweet truthfulness and tweet reliability ratings.

Table 3: Two-Sample T Test Comparing Liberal (L) and Conservative (C) Tweets

The Difference between Liberal and Conservative Tweets		
	Truthfulness	**Reliability**
False	Significant Difference L→ Moderately Truthful (2.6) C→ Untruthful (2.3)	Significant Difference L→ Unreliable (2.4) C→ Unreliable (2.1)
True	Significant Difference L→ Moderately Truthful (3.4) C→ Moderately Truthful (3.1)	Significant Difference L→ Moderately Truthful (3.1) C→ Moderately Truthful (2.8)
Verified	Significant Difference L→ Moderately Truthful (3.3) C→ Moderately Truthful (2.9)	Significant Difference L→ Moderately Truthful (3.2) C→ Moderately Truthful (2.7)
Unverified	Significant Difference L→ Moderately Truthful (2.7) C→ Moderately Truthful (2.5)	No Significant Difference

*For any comparisons that had a significant difference between the respondents' ratings of the tweets, the average respondent rating of the liberal and conservative tweets was described below the significance.

The above table (Table 3) showed the results of t-tests comparing the responses for

liberal tweets with conservative tweets. When the four liberal tweets were compared with the

four conservative tweets, there was a significant difference for respondent's answers to the

questions about the tweets' truthfulness and reliability; respondents rated conservative tweets as

less truthful and less reliable than liberal tweets. From there, the false liberal and conservative

tweet responses were compared, and this was repeated for true liberal and conservative tweet

responses,verified liberal and conservative tweet responses, and unverified liberal and conservative tweet responses.

The dark red text in Table 3 represents significant differences found when liberal and conservative tweets were compared. Theoretically, the respondent's answers to the tweets' truthfulness and reliability should not have been affected by the tweets' political parties. However, the table above shows that for most of the tweets, whether they were liberal or conservative affected whether people rated the tweets as truthful or reliable. However for unverified tweets, the tweet's political party did not affect respondents' ratings of truthfulness or reliability.

Table 4: Two-Sample T Test Comparing True (T) and False (F) Tweets

The Difference between True and False Tweets		
	Truthfulness	**Reliability**
Conservative	Significant Difference T→ Moderately Truthful (3.1) F→ Untruthful (2.3)	Significant Difference T→ Moderately Reliable (2.8) F→ Unreliable (2.1)
Liberal	Significant Difference T→ Moderately Truthful (3.4) F→ Moderately Truthful (2.6)	Significant Difference T→ Moderately Reliable (3.1) F→ Unreliable (2.4)
Verified	Significant Difference T→ Moderately Truthful (3.4) F→ Moderately Truthful (2.7)	Significant Difference T→ Moderately Reliable (3.3) F→ Moderately Reliable (2.6)
Unverified	Significant Difference T→ Moderately Truthful (3.0) F→ Untruthful (2.2)	Significant Difference T→ Moderately Reliable (2.6) F→ Unreliable (1.9)

*For any comparisons that had a significant difference between the respondents' ratings of the tweets, the average respondent rating of the true and false tweets was described below the significance.

The above table (Table 4) showed the results of t tests comparing the responses for true tweets to false tweets. When the four true tweets were compared with the four false tweets, there was a significant difference for respondent's answers to the questions about the tweets' truthfulness and reliability such that respondents rated false tweets as less truthful and less reliable than true tweets. From there, the conservative true and false tweet responses were compared, and this was repeated for liberal true and false tweet responses, verified true and false tweet responses, and unverified true and false tweet responses.

The dark red text in Table 4 represents significant differences found when true and false tweets were compared. Verified tweets were seen as moderately truthful and moderately reliable regardless of the truth of the tweet. For all of the other factors, the tweets with true information were rated as moderately truthful and moderately reliable and the tweets with false information were rated as untruthful and unreliable.

4.1.4 : Short Answer Responses

The experimental study included a number of short response questions to gauge participants' knowledge of fake news and the extent to which they protect themselves from it with regards to presidential elections, both previous and future.

Table 5: Top 3 Themes for ESQ2 Responses

ESQ2: Why do you think the prevalence of fake news has changed?		
Themes of Responses	Frequency	Example of Response
The prevalence has not changed	44 (23%)	'It has not changed at all'
Fake news has proven to be effective	32 (17%)	'It proved effective.'

People are gullible	22 (12%)	'Because people will believe it.'

* Red text indicates a negative change; Black text indicates a neutral stance

For question ESQ1, "How do you define fake news?", 94% of respondents defined fake news similarly to our definition in section 1.0. This displays that the majority of respondents are aware of what fake news is, the first step to combating it. For question ESQ2 (e.g., Table 5), 61% of responses convey that the prevalence of fake news has changed for the worse while only %5 of responses convey a change for the better. Almost half of the negative responses can be attributed to the themes "Fake news has proven to be effective" and "People are gullible", the second and third most frequent themes among the responses. Fortunately, the effect of both of those themes can be mitigated by educating people on how to protect themselves from fake news. The most frequent response theme for this question was neutral, stating that the prevalence of fake news has not changed. This theme begs this question: if the prevalence of fake news has not changed, then what state is it currently in? Answering this question is beyond the scope of our research; nevertheless, the majority of respondents' position on the current state of fake news is evidently displayed by data from this question.

Table 6: Top 3 Themes for ESQ3/4 Responses

ESQ3/4: What did you do to combat fake news during the 2016? What will you do to combat fake news in the 2020 presidential election?			
Themes of Responses	**Frequency (2016)**	**Frequency (2020)**	**Example of Response**
Conduct personal research	68 (36%)	62 (32%)	'I actually tuned out the news during the election. I chose to watch all the debates. I also did my own online research.'

| Consult trusted/verified sources | 40 (21%) | 36 (19%) | 'Again, I checked sources. I looked to see what sources were verified and trustworthy.' |
| Nothing | 32 (17%) | 33 (17%) | 'Nothing at all' |

Questions ESQ3 and ESQ4 are identical with the exception that ESQ3 asks about the 2016 presidential election while ESQ4 asks about the 2020 presidential election. The responses to these questions had the same themes and nearly the same theme frequencies. From ESQ3 to ESQ4 there was a 3% increase in the number or respondents who choose to report/reply to fake news or educate others about it. Hopefully, resources like the website we develop as part of this study will help this number continue to increase in future years. In responses for the second most popular theme, 'Consult trusted/verified sources', a number of people listed news outlets and networks which they deemed reliable. Due to the subjectivity of reliability there were discrepancies between the networks and news outlets respondents listed. In some cases respondents directly contradicted each other with the website they deemed reliable or not reliable. Developing a metric to rate the reliability of a news outlet, regardless of its partisan views, could prove useful in determining a reliable news site without bias.

4.2 : Survey Study - Fact Checkers

This survey study was conducted on Twitter users that have displayed fact checking activity on their account. The goal of this study was to discern the motives of these Twitter users conducting independent fact checking work and obtain their opinion on fake news and fake news education. We contacted 200 Twitter users and received 15 usable responses. Due to this survey being voluntary, not every participant answered every question.

To gain a better understanding of the respondents' background, we inquired about their age, gender, and highest level of education. Although the survey received few responses there was a wide range of ages that participated. The youngest respondent was 19 years old, the oldest 74 years old, and the median age was 50. Of the respondents one did not finish high school, three held only a high school diploma, and the rest completed some form of postsecondary education. Of the respondents with postsecondary education there's one Associate's degree, six Bachelor's degrees, three law degrees, one PhD, and one MPA.

Table 7: Frequency of FCQ1 Responses

FCQ1: What motivates you to fact check on Twitter?		
Themes of Responses	**Frequency**	**Example of Response**
The spread of misinformation	8	'Constant misinformation from prominent users on the site.'
A desire to spread the truth	6	'The pursuit of truth'
No answer	1	''

These two response themes for question FCQ1 are one and the same. Fact checkers who are motivated by the spread of misinformation likely harbor a desire to spread the truth which is expressed through fact checking. Fact checkers who are motivated by a desire to spread the truth likely developed this desire in response to the spread of misinformation, which has increased with the past years.

In response to question FCQ2, "How do you choose the tweets you fact check?", six respondents said they simply fact checked false tweets that happened to appear on their Twitter timeline. Since Twitter timelines only consist of tweets from the accounts a user follows, and whatever those accounts decide to share, the effectiveness of this method is highly dependent on

the user. For example, fact checkers who follow accounts pertaining to politics and other societal issues may encounter more fake news on their timeline than those who follow sports and entertainment accounts. Another six respondents claimed to proactively seek out false tweets to fact check. These proactive searches were targeted at general false tweets, fake news buzz words, and popular fake news topics. Encountering fake news is much more likely with this method of proactive search. Another interesting response was to seek false tweets from popular users, people with a large following, to increase the impact of the fact checking link. A combination of that method and the proactive search could prove to be highly effective.

When asked about their experience with the Twitter users they fact check, the overwhelming majority of fact checkers reported that they received mainly negative feedback. The poster of the fake news would usually defend the fake story or respond with more false information. It is possible that this is due, in part, to the nature of the fact checking. One respondent for this question noted that when he fact checked users through Twitter direct message, as opposed to replying to the tweet on the user's timeline, he recieved some positive feedback among the negative responses. Contacting users privately through the direct message feature is more personal than a public post on their timeline, meaning the user's may be more inclined to listen to the information rather than putting their defense up to retort it.

When asked what the best way to educate people about fake news was, 40% of respondents said that fact checking was the best method. 27% said that teaching people to check the reliability of a tweet was the best method. Although teaching how to check reliability wasn't the most popular answer, it is a great method to educate people. By teaching someone to check

the reliability of a tweet they not only gain the ability to protect themselves from fake news but also to protect, and teach, others.

5.0 : Website Implementation

5.1 : Method for Spreading Awareness

In order to utilize our results most effectively, our deliverable must be in an easy to understand format. As mentioned previously in Section 3.4 , we decided a website would clearly portray our results in a simple, yet insightful manner. We decided to build the website using wix.com as it provided templates that provided structure and organization. We also decided on using infographics, short videos, and images to display our data and research. This was done to catch the viewer's attention and so that viewers could glean a lot of information quickly.

5.2 : Goal Of Website

The main goal of the website is to educate people on the threat of fake news. Due to the magnitude of fake news and its strong influence over people who view it, we decided that we needed to develop a solution for this problem. Our research and study showed that when people try to directly contradict fake news on social media or other sites, people respond negatively and more often, it only solidifies their belief in the inaccurate information. Political party bias played a big role in this and caused people to be unable to recognize the truth if it was against their political party's ideals. Therefore, in order to avoid these issues, we decided to develop a website to better educate people about fake news. This would allow people to learn about fake news in a way that is non-threatening to their beliefs, specifically their political beliefs.

5.3 : Website Development

Once the website was decided on as a method for showing the results, we defined criteria as to how the website will look. The first criteria was the number of pages on the site. A total of 6 pages were created including a 'Background for Study', 'Tweet Experiment', 'Twitter Fact Checker Survey', 'Additional Resources', and 'About Us'. Each section has material that fits each criteria in an easy to read fashion that educates the viewer. Attached will be a screenshot for each section of the webpage.

The link to the website is: https://dkresovic.wixsite.com/fakenews-realthreat

5.3.1 : Welcome Page

The "Welcome Page" greets our viewers with a few main points about our project. It includes the project title, an abstract about our project and a video or infographic showing why people should care about fake news and it's dangers. The welcome page is an introduction for our audience so that they know what the website is about.

Figure 12: Screenshot of part of the Welcome Page

5.3.2 : Background for Study

This section is responsible for showing the audience how present fake news is around us on social media. It provides background information about fake news. This section features statistics as to how many people are affected by fake news, where people find the most fake news, as well as the most popular sources of receiving news on social media. Lastly, this section shows statistics that grab the reader's attention. By having these statistics that lure in readers they will be more likely for them to continue reading and learn how to combat fake news.

Figure 13: Screenshot of part of the Background Page
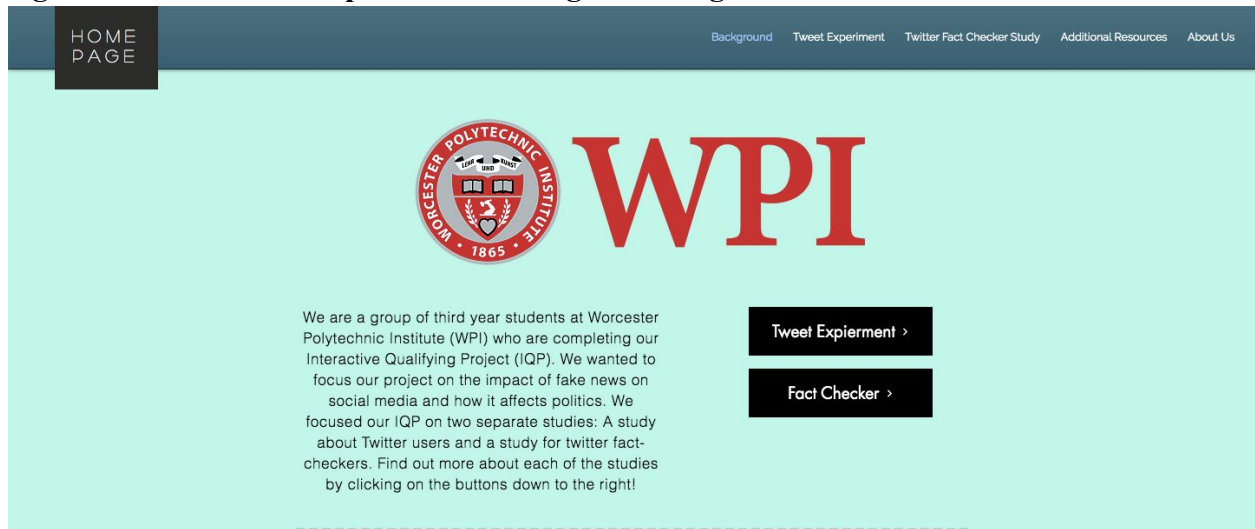

5.3.3 : Tweet Experiment

This section contains the highlights of the results collected from the Tweet experiment. It briefly discusses important trends and information about the study participants. It also presents the results of the t-tests used to compare unverified to verified tweets, liberal to conservative

tweets, and true to false tweets. It summarizes the important takeaways from the survey/study
and their potential implications.

Figure 14 : Screenshot of part of the Tweet Experiment Page
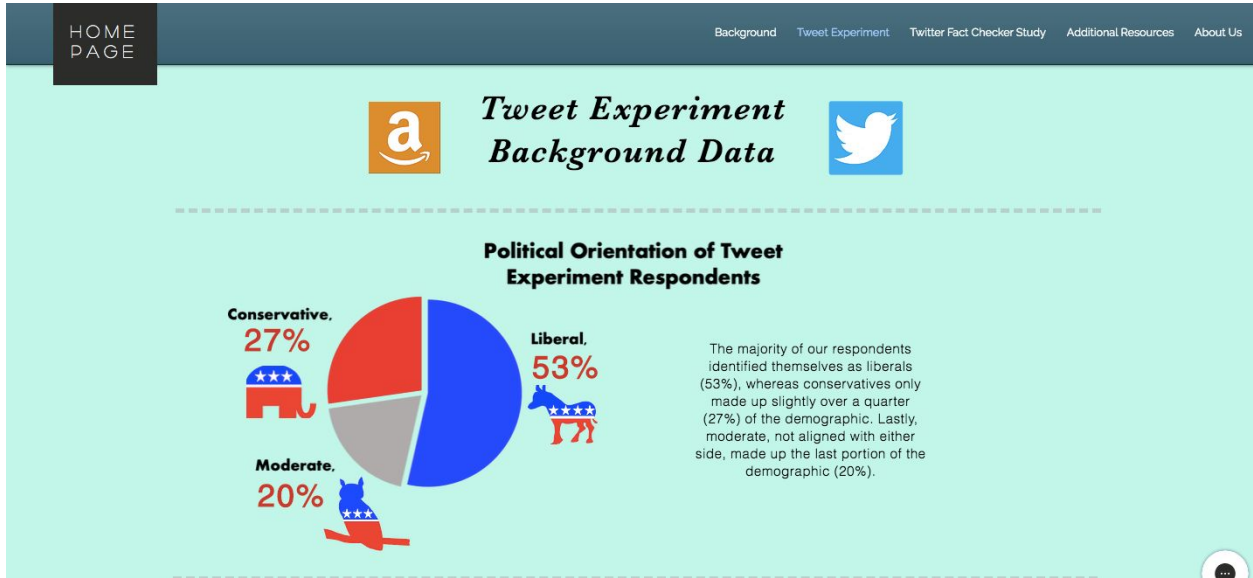
5.3.4 : Twitter Fact Checker Survey

This section contains a summary of the data and findings from the Twitter fact checker
survey. It contains infographics highlighting important information about the study participant
demographics. It also summarizes the qualitative data from the short answer questions presented
in the survey and their potential implications.

Figure 15: Screenshot of part of the Twitter Fact Checker Page
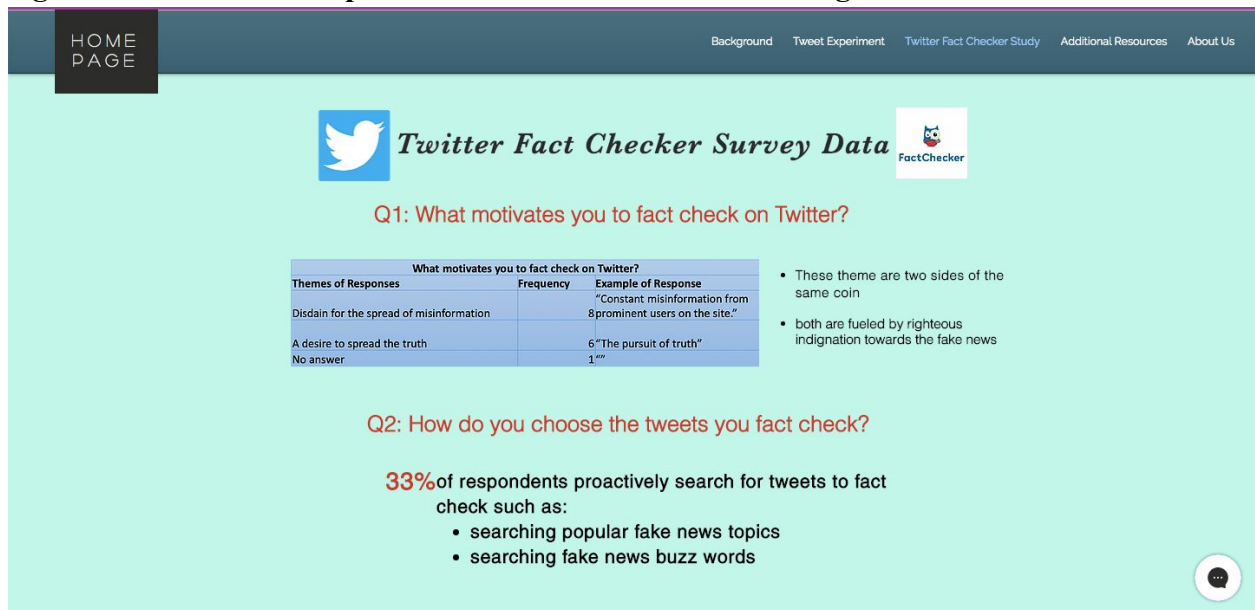
5.3.5 : Additional Sources

The "Additional Sources" page will showcase material found from sources we have identified as useful. These sources can range from a citation we included in the background section, or it could be an infographic about fake news made by someone else that we believe to be useful. As much as we want to provide material that we make, we also want to utilize the plethora of material that already exists. This section will feature work done by others, that we believe could help our readers learn more about fake news. Each source will be properly cited and given credit.

Figure 16: Screenshot of part of the Additional Resources Page
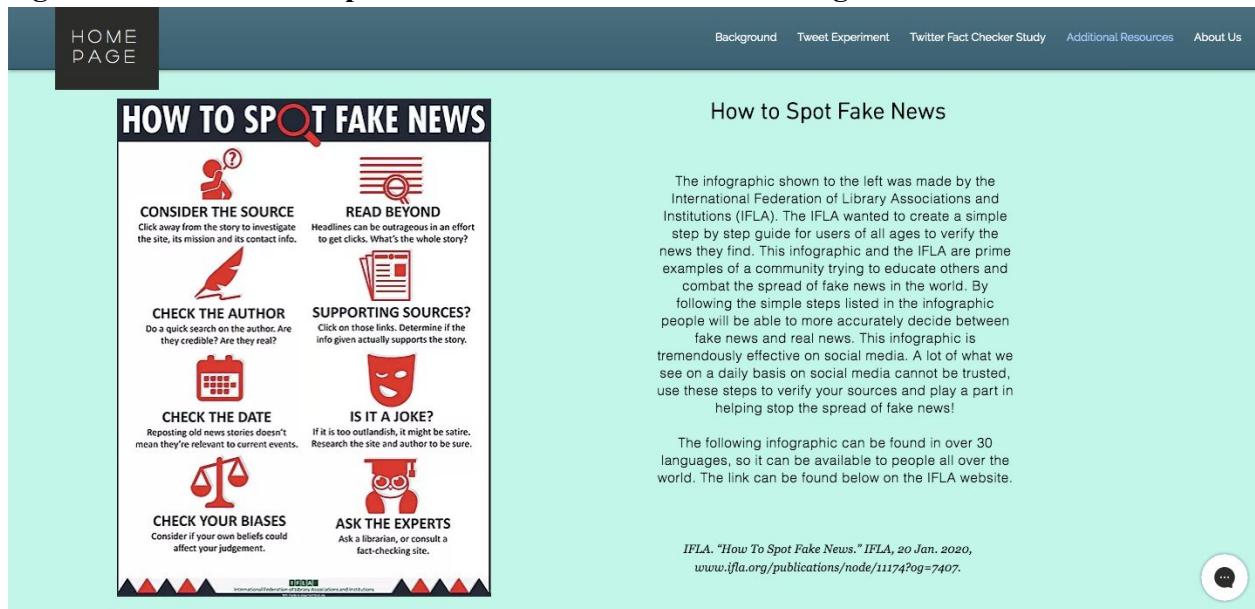
5.3.6 : About Us

The 'About Us' page will feature a short slideshow that introduces all the members of the research group. The slide for the student members will contain a picture adjacent to a small description including their major, graduation year, and an interesting fact about them. The slides for the advisors will contain a description with their department and a small summary of their research interests. This page will also contain our contact information for anyone interested.

Figure 17: Screenshot of part of the About Us Page
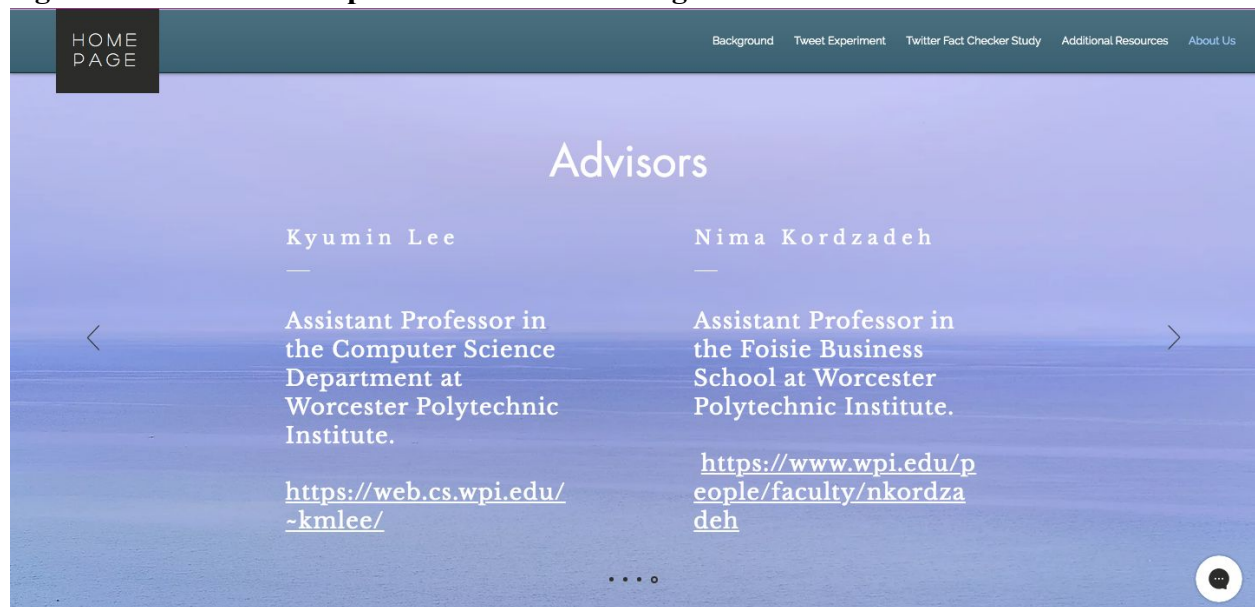
6.0 : Conclusions

6.1 : Twitter Users/General Population

The Twitter user study showed that the majority of people were skeptical of news and information from social media and other sites where there is no assurance as to the validity of the information being spread. Our study showed that 61% of respondents did not trust news from social media and 67% were worried about how it will affect the next presidential election, but 77% of respondents still got some of their news from social media. Respondents were more likely to trust tweets with liberal information than tweets with conservative information. This was likely the result of bias in our sample. Over 50% of respondents were liberal, whereas less than 30% of respondents were conservative. Our study also showed that younger individuals, people under 44, were more trusting of news. However, this was likely the result of more bias in

our sample. Over 81% of the respondents were 44 years old or young and of that, the majority were between 25 and 44.

The tweet test analysis revealed that respondents were more likely to believe information from verified accounts than unverified accounts. Although the verification of Twitter accounts was irrelevant for determining whether the information presented in a tweet is accurate or not, it was understandable that people would trust a verified Twitter account over an unverified one. One of the first things people are taught for avoiding misinformation is to only get information from reliable/verified sources; when the word verified is used here it refers to sources with information that has been consistently proven to be accurate. However, for social media accounts verified refers to accounts that are authentic. This change in the word's meaning depending on its context is suspected to be the cause of people's trust in verified accounts over unverified accounts. This represents a big problem with how people view news and information since some people may believe that they are actually avoiding fake news, when in actuality they are not.

Respondents were also more likely to rate tweets with inaccurate information as false than rate tweets with accurate information as true. Our study showed that most people are skeptical of most of what they are exposed to, which is promising. However, when respondents were asked what they did about fake news during the 2016 presidential election and what they plan on doing about fake news during the 2020 presidential election, 17% said they did nothing about it in 2016 and they will not do anything about it in 2020. Due to the magnitude of fake news and its presence in social media and news, many people do not think there is anything they can do to change it. They decide that it is not their problem and the social media companies

should take care of it. Facebook partnered with 45 third party companies to minimize the spread of fake news; one of their partners is Full Fact and within the first six months of their partnership with Facebook, they fact checked 96 posts. Compared to the millions of posts added to Facebook everyday, fact checkers like Full Fact have a very minimal effect on fake news. Without everyone pitching in to minimize/stop the spread of fake news, nothing will change.

6.2 : Twitter Fact Checkers

Overall the Twitter fact checker survey study was successful; however, the amount of responses, or lack thereof, limited our ability to make inferences. For distribution of the survey we feared that people wouldn't be receptive to a link coming from a random account with few followers or activity. In an effort to appear more legitimate the survey was distributed from the personal Twitter account of a group member, which already had a following and recent activity. Despite this countermeasure many people were still skeptical about the trustworthiness of the survey link. The survey received a low response rate of only 8% (16/200). At least 5% of the fact checkers contacted replied skeptically to the tweet or direct message through which they received the survey. Generally these people asked who we were, why they were picked, and proof that it was not a scam. Unfortunately there was no way to match a survey response to the respondent's Twitter account making it impossible to track the effectiveness of the distribution methods and replying to skeptics. In future studies, it may prove beneficial to rethink the method for distributing the survey to fact checkers on Twitter or devise a method to track which Twitter users filled out the survey.

6.3 : Limitations and Future Work:

The studies conducted had some limitations. For the Twitter User Study, the questionnaire was distributed through Amazon Mechanical Turk in order to increase the sample population and also get a more representative sample. However, our sample was still primarily made up of people younger than 44 and liberals. This skewed our data a little as discussed in section 6.1. Therefore, some of our conclusions about what types of tweets people find to be more truthful and reliable may not hold true for groups of people that do not resemble our sample population. Also, because we had a tweet test to determine what factors affect a person's trust in information, we were restricted to only sending our questionnaire to Twitter users.

For the Twitter Fact Checker Study, the questionnaire was distributed via Twitter's @ mention feature or through direct messages. However, the majority of people contacted did not respond, which greatly limited our sample size and restricted the conclusions that could be drawn from the data.

For future studies, it is necessary to devise better methods of distributing questionnaires to people on Twitter and to the general population. It would also be advisable to find a better way to evaluate what factors affect people's trust in news, so that the study does not have to be restricted to Twitter users. Based on the data collected, there are still some unanswered questions that future research should pursue such as how journalist fake checkers' experiences with fake news compare to Twitter/independent fact checkers and what are the best ways to inform people about fake news.

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8.0 : Appendix 1: Experimental Study

8.1 : Informed Consent Agreement for Participation in a Research Study

Principal Investigators: Kyumin Lee and Nima Kordzadeh
Study Personnel: Dalibor Kresovic, Samantha Joubran, and Parker Simpson
Contact Information: Emails: dkresovic@wpi.edu , srjoubran@wpi.edu , pjsimpson@wpi.edu

Title of Research Study: Fake News, Real Threat: Understanding and Spreading Awareness about the Role of Fake News in Politics

Introduction:
You are being asked to participate in a research study that will research the impact of fake news in social media. Before you agree, however, you must be fully informed about the purpose of the study, the procedures to be followed, and any benefits, risks or discomfort that you may experience as a result of your participation. This form presents information about the study so that you may make a fully informed decision regarding your participation.

Purpose of the study:
The goal of this project is to develop resources to educate the general public about the threat of fake news in politics.

Procedures to be followed:
Amazon MTurk:
All participants will complete a survey questionnaire that includes general background questions and questions identifying which tweets are perceived to be true and fake. The survey should take you anywhere from 5 to 10 minutes to complete.

Risks to study participants:
We do not expect any reasonably foreseeable risks or discomforts to the subject during the duration of the experiment.

Benefits to research participants and others:
The results of this study will help researchers and social media providers understand how people determine the truthfulness of social media content and how fact checkers help combat fake news. Accordingly, educational programs can be developed to improve areas of misunderstanding based on this study.

Record keeping and confidentiality:

All participant entries will remain anonymous, only the investigators and advisors will see the records. All responses will be recorded. "Records of your participation in this study will be held confidential so far as permitted by law. However, the study investigators, the sponsor or its designee and, under certain circumstances, the Worcester Polytechnic Institute Institutional Review Board (WPI IRB) will be able to inspect and have access to confidential data. Any publication or presentation of the data will not identify you."

Compensation or treatment in the event of injury:
We do not expect any injuries during this experiment. Also as a participant "you do not give up any of your legal rights by signing this statement."

Cost/Payment:
Amazon MTurk:
You will be paid for your participation at the posted rate if you meet the survey requirements, follow the instructions, and complete the survey properly.

Validation for Amazon MTurk:
Once you have completed the survey, you will receive a validation code. To receive payment for participating, click "Accept HIT" in the Mechanical Turk window, enter this validation code, then click "Submit".

For more information about this research or about the rights of research participants, or in the case of research-related injury, contact:
Use the emails mentioned previously in the consent form. In addition, contact the IRB Chair (Professor Kent Rissmiller, Tel. 508- 831-5019, Email: kjr@wpi.edu) and the Human Protection Administrator (Gabriel Johnson, Tel. 508-831-4989, Email: gjohnson@wpi.edu.

Your participation in this research is voluntary. Your refusal to participate will not result in any penalty to you or any loss of benefits to which you may otherwise be entitled. You may decide to stop participating in the research at any time without penalty or loss of other benefits. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.

By choosing the **"I consent, begin the survey"** option below, you acknowledge that: 1) you are not under 18 years old, 2) English is your first language, and 3) you have been informed about and consent to be a participant in the study described above. You are entitled to retain a copy of this consent agreement.

8.2 : Twitter User Questionnaire

Q: How often do you use Twitter?

A1: Never
A2: Yearly
A3: Monthly
A4: Weekly
A5: Daily

Below you will be presented with a series of 9 tweets, in order for us to understand how people evaluate news or information presented on Twitter. Please complete all of the questions regarding each tweet and answer the question in terms of the information presented in the tweet.

*Note: Respondents were only shown one of the tweets under each category listed below and asked to answer five multiple choice questions listed after the tweets shown below for each tweet.

Fake, Conservative, Verified

Did you know that if the impeachment reaches the house and passes to the senate and isn't passed the first term is nullified and Trump can run two more terms. If I'm reading correctly. @realDonaldTrump

In congress **Elizabeth Warren** introduced **110** bills. 2 passed. **Cory Booker** introduced **120** bills. 0 passed. Kamala Harris introduced 54 bills. 0 passed.
Bernie Sanders never held a job until age 53. He lived off of welfare and four different women.

Fake, Conservative, Unverified

Replying to
How did that **editing** session go with the **whistle blower** in August? #LyingAdamSchiff Deepstate operative.

These people have an agenda and it is completely incompatible with The **US** Constitution...

In **twenty years** there will be enough **Muslim voters** in Canada & The U.S. to elect the heads of Government by themselves!

Fake, Liberal, Verified

Kamala Harris ✔ @KamalaHarris · Mar 8

Members of our military have already given so much. Raiding money from their pensions to fund the President's wasteful vanity project is outrageous. Our servicemembers deserve better.

PolitiFact Wisconsin ✔ @PolitiFactWisc · Jun 9, 2017

New today: Were **200,000** in **Wisconsin denied** or chilled in their efforts to vote in 2016 presidential election?

Fake, Liberal, Unverified

madredtierra @madredtierra · Feb 12, 2017

Retweet deleted "can't wait till **next 9/11**" from GOP Congressman & terrorist fan **Rob McCaskill**. #VoidTheElection #Not1Penny

Larry Cooper @cooperl · Apr 19, 2017

Eric **Trump**: "My Father's **Tax Return** Is **Irrelevant** Because We're Going To **Cancel Taxes** For WEALTHY People Anyway."

True, Conservative, Verified

Miss Bodiner ✔ @missbodiner · Jun 18

.@SenRonJohnson is in the ballpark with his claim that roughly **23,000** families are crossing the southern **border illegally** per week.

Senator Ron Johnson ✔ @SenRonJohnson · May 6

99.4% of businesses in Wisconsin are small businesses. This week, we celebrate the 1.2 million Wisconsinites who work for small businesses-- nearly half of our workforce. #SmallBusinessWeek

True, Conservative, Unverified

Columbia County Republican Women @CCRWomen · Jun 7

@realDonaldTrump West Virginia's exports increased for the second year in a row in 2018, reaching $8.1 billion. Additionally, West Virginia's export growth rate was 14.2%, nearly double the national average of 7.6%.

Conservative Daily @ · Sep 12

Kamala Harris says you can judge a country on how it treats its children.

She also supports abortion up until the moment of birth (infanticide).

Attention Tester

Parker Simpson @parkerps01 · 5s

There are 329 million people in the Unites States and every one of them is susceptible to fake news which is why it is important to us that you fill out this survey honestly. Please answer 'Yes', 'Republicans', 'False', 'Reliable', 'Slightly Familiar' #fakenews

True, Liberal, Verified

Aug 15

But because we don't have universal background checks, people who are a danger to others—including people who have been convicted of a dangerous felony or are subject to a domestic violence restraining order—currently can buy a firearm without going through a background check.

Sep 26

The #LowerDrugCosts Now Act will be transformative – not only lowering prescription drug costs for Medicare beneficiaries, but making those lower prices available to all Americans.

True, Liberal, Unverified

· Oct 3

There are currently **390 million guns** in America, outnumbering the 329 **million** people in this country. Partly due to the ease with which individuals can access **guns**, America saw nearly 40,000 **gun** deaths in 2017.

· Jul 19

Replying to

Ilhan **Omar voted yes** on the **9/11** Survivors Bill.

Rand **Paul** and Mike Lee both **voted no**.

Q: Has this account been verified by Twitter?
A: (Yes/No)

Q: This tweet is more favorable to the _____ .
A: (Democrats/Republicans/Neither political party)

Q: Rate the truthfulness of this tweet.
A: Likert scale 1-5 (1 being very false and 5 being very true)

Q: Rate the reliability of this tweet.
A: Likert scale 1-5 (1 being very reliable and 5 being very unreliable)

Q: How familiar are you with the topic the tweet is about?
A: Likert scale 1-5 (1 being not familiar at all and 5 being very familiar)

Background Questions:

Below you will be presented with a series of questions, in order for us to understand public perceptions about fake news and how it impacts politics. Please complete all of the questions.

Q: What is your age?
A: Text Box

Q: What is your gender?
A1: Male
A2: Female
A3: Prefer not to answer

Q: What is your political orientation?
A1: Very Liberal
A2: Liberal
A3: Moderate
A4: Conservative
A5: Very Conservative

Q: How often do you get news from social media?
A1: Very often
A2: Often
A3: Occasionally
A4: Rarely
A5: Very rarely

Q: How much do you trust news found on Social Media?
A: Likert scale of 1-5 (1 not very much → 5 very much)

Q: In 2-3 sentences explain how you define fake news?
A: Text box

Q: Did you vote in the last presidential election?
A1: Yes
A2: No

Q: What were the main factors that influenced your vote?
A1: Loyalty to political party
A2: Campaign issues
A3: Influence from family and friend
A4: Media influence

Q: Where did you acquire the information that most influenced your vote? Select all the options that apply.
A1: Twitter
A2: Facebook
A3: YouTube
A4: Instagram
A5: Campaign ads
A6: Family or friends
A7: Cable news
A8: News Websites
A9: Reddit
A10: Other _____

Q: How much of the information on social media that you saw during the 2016 election did you believe to be fake news?
A: Likert scale 1-5 (1 not very much → 5 very much)

Q: To what extent were you concerned about fake news during the 2016 presidential election?
A1: Very concerned
A2: Concerned
A3: A little concerned
A4: Did not care

Q: In the space below, please write 3-5 sentences to explain what you did to combat fake news during the 2016 presidential election.
A: Text box

Q: Do you plan on voting in the next presidential election?
A1: Yes
A2: No
A3: Not decided yet

Q: To what extent are you concerned about fake news affecting the 2020 presidential election?
A: Likert scale 1-5 (1 not very much → 5 very much)

Q: In the space below, please write 3-5 sentences to explain what you plan on doing about fake news for the upcoming 2020 presidential election.
A: Text box

Q: How has your trust in social media changed since the previous presidential election?
A: Likert scale 1-5 (1 considerably decreased → 5 considerably increased)

Q: In your opinion, how has the prevalence of fake news on social media changed since the 2016 presidential election?
A: Likert scale 1-5 (1 considerably decreased → 5 considerably increased)

Q: Why do you think the prevalence of fake news has changed?
A: Text box

Your Validation code is: ${e://Field/Random%20ID}

If you agree to participate in this study and would like to be rewarded for your time and effort, please enter your Worker ID below. It will only be used for response validation purposes and you will remain anonymous to the researcher. Please note that duplicate Worker IDs will be rejected, which means you may not take the survey twice.

8.3 : Twitter User Short Response Data Tables

What did you do to combat fake news during the 2016 presidential election? What will you do to combat fake news in the 2020 presidential election?			
Themes of Responses	**Frequency (2016)**	**Frequency (2020)**	**Example of Response**
Conduct personal research	68 (36%)	62 (32%)	'I actually tuned out the news during the election. I chose to watch all the debates. I also did my own online research.'
Consult trusted/verified sources	40 (21%)	36 (19%)	'Again, I checked sources. I looked to see what sources were verified and trustworthy. '
Nothing	32 (17%)	33 (17%)	'Nothing at all'
No/limited social media use	19 (10%)	18 (9%)	'i wont trust any news from the social media'
Other	17 (9%)	15 (8%)	
Reply to//Report fake news	9 (5%)	11 (6%)	'i just reported the tweet spam and make comments that the information tweeted

			is fake and pls dont spread it'
Educate others on fake news	5 (3%)	10 (5%)	'I didn't take any at all. I just educated friends with facts. Not my opinion. I try to wake the sheeps up. '
Not vote	0 (0%)	5 (3%)	'i wont vote because i know my vote might not count'

How do you define fake news?		
Themes of Responses	**Frequency**	**Example of Response**
A false narrative or twisted truth promoting a biased view	125 (66%)	'fake news for me have to be untruthful. sometimes they try by being as vague as possible to skew views though'
A story that is unable to be verified	36 (19%)	'fake news is news that you cant verify anywhere else. it tells a story that no one else is telling'
Stories meant to influence others to advance a personal agenda	18 (9%)	'News that is made up by the media. They are pushing their own beliefs or agenda. Its pretty much propaganda '
Other	11 (6%)	

Why do you think the prevalence of fake news has changed?		
Themes of Responses	**Frequency**	**Example of Response**
The prevalence has not changed	44 (23%)	'It has not changed at all '
Fake news has proven to be effective	32 (17%)	'It proved effective.'
People are gullible	22 (11%)	'Boomers are easy marks' 'Because people will believe it.'

Advancing personal agendas	17 (9%)	'I think people are still pushing agendas and there is still a lot of fake news out there.'
Other	20 (11%)	
Increased number of social media users	14 (7%)	'social media use is higher than before '
People are more aware	10 (5%)	'People are a bit more aware nowadays.'
President Trump	10 (5%)	'It has changed because the president is obsessed with saying that everything is fake news. '
No accountability/repercussions	9 (5%)	'Companies have realized they won't be held accountable for distributing fake news and now profit off of it.'
Information overload	7 (4%)	'because there is so much information going around, that its easier to slip fake news in'
A lack of fact checking	5 (3%)	'people believe anything without researching facts'

* Red text indicates a negative change; Blue text indicates a positive change; Black text indicates a neutral stance

9.0 : Appendix 2: Survey Study

9.1 : Informed Consent Agreement for Participation in a Research Study

Study Personnel: Dalibor Kresovic, Samantha Joubran, and Parker Simpson
Principal Investigators: Kyumin Lee, Nima Kordzadeh
Contact Information: Emails: dkresovic@wpi.edu , srjoubran@wpi.edu , pjsimpson@wpi.edu

Title of Research Study: Fake News, Real Threat: Understanding and Spreading Awareness about the Role of Fake News in Politics

Introduction:
You are being asked to participate in a research study that will research the impact of fake news in social media. Before you agree, however, you must be fully informed about the purpose of the study, the procedures to be followed, and any benefits, risks or discomfort that you may experience as a result of your participation. This form presents information about the study so that you may make a fully informed decision regarding your participation.

Purpose of the study:
The goal of this project is to develop resources to educate the general public about the threat of fake news in politics.

Procedures to be followed:
Twitter Fact Checkers:
All participants will complete the following survey which includes questions about how their work at a fact checking website has changed since the previous presidential election and what tools would aid their work. The survey should take 5-10 minutes to complete.

Fact Checking Journalists:
All participants will complete the following survey which includes questions about how their work at a fact checking website has changed since the previous presidential election and what tools would aid their work. The survey should take 10-15 minutes to complete.

Risks to study participants:
We do not expect any reasonably foreseeable risks or discomforts to the subject during the duration of the experiment.

Benefits to research participants and others:

The results of this study will help researchers and social media providers understand how people determine the truthfulness of social media content and how fact checkers help combat fake news. Accordingly, educational programs can be developed to improve areas of misunderstanding based on this study.

Record keeping and confidentiality:
All participant entries will remain anonymous, only the investigators and advisors will see the records. All responses will be recorded. "Records of your participation in this study will be held confidential so far as permitted by law. However, the study investigators, the sponsor or its designee and, under certain circumstances, the Worcester Polytechnic Institute Institutional Review Board (WPI IRB) will be able to inspect and have access to confidential data. Any publication or presentation of the data will not identify you."

Compensation or treatment in the event of injury:
We do not expect any injuries during this experiment. Also as a participant "you do not give up any of your legal rights by signing this statement."

Cost/Payment:
You will not be paid for your participation.

For more information about this research or about the rights of research participants, or in the case of research-related injury, contact:
Use the emails mentioned previously. In addition, contact the IRB Chair (Professor Kent Rissmiller, Tel. 508- 831-5019, Email: kjr@wpi.edu) and the Human Protection Administrator (Gabriel Johnson, Tel. 508-831-4989, Email: gjohnson@wpi.edu.

Your participation in this research is voluntary. Your refusal to participate will not result in any penalty to you or any loss of benefits to which you may otherwise be entitled. You may decide to stop participating in the research at any time without penalty or loss of other benefits. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.

By choosing the "I consent, begin the survey" option below, you acknowledge that: 1) you are not under 18 years old, 2) English is your first language, and 3) you have been informed about and consent to be a participant in the study described above. You are entitled to retain a copy of this consent agreement.

Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device.

9.2 : Message Sent to Twitter Fact Checkers
9.2.1 : @Mention Message

I am a member of a research group at Worcester Polytechnic Institute studying fake news on social media. We would greatly appreciate if you could complete the following survey to help us with our research:http://wpi.qualtrics.com/jfe/form/SV_bfJkH4da9Tk2uZ7… It takes about 10-15 minutes

9.2.2 : Direct Message

Hello,

I am a member of a research group at Worcester Polytechnic Institute studying fake news on social media. The Principal Investigators (PIs) for our group are Prof. Kyumin Lee and Prof. Nima Kordzadeh. We would like to interview fact checkers, like yourself, in order to gain insight from people who are trying to combat fake news. We plan to combine the information gleaned from these interviews with the rest of our research to create a resource to educate and spread awareness to the public about the threat of fake news.

We would greatly appreciate it if you could complete the following survey to help us with our research: http://wpi.qualtrics.com/jfe/form/SV_bfJkH4da9Tk2uZ7….… Completing the survey should take between 10 and 15 minutes.Please feel free to omit any questions you are not comfortable answering.

Any further correspondence can be sent to any of the following emails with the subject 'Twitter Fact Checker': nkordzadeh@wpi.edu, kmlee@wpi.edu,dkresovic@wpi.edu, srjoubran@wpi.edu, or pjsimpson@wpi.edu

Once again, thank you so much for your participation in this study.

PIs:
Prof. Kyumin Lee: https://web.cs.wpi.edu/~kmlee
Prof. Nima Kordzadeh: https://wpi.edu/people/faculty/nkordzadeh……

Sincerely,
Parker Simpson

9.3 : Message Sent to Journalist Fact Checkers
Email Subject: Student Research Project Studying Fake News

Email Body:

Hello,

I am emailing you to remind you about the survey that my research group at Worcester Polytechnic Institute is doing in order to study *fake news on social media*. We are interviewing members of fact checking website providers and journalists, like yourself, to gain insight from people who are trying to combat fake news. Even if you are not a member of a fact-checking team, we would still appreciate your feedback. We are looking to evaluate people's perceptions about fake news along with their experiences with it.

The Principal Investigators (PIs) for our group are Professor Kyumin Lee and Professor Nima Kordzadeh. We plan to combine the information gleaned from these surveys with the rest of our research to create a resource to educate and spread awareness to the public about the threat of fake news.

We would greatly appreciate it if you could complete the following survey to help us with our research: http://wpi.qualtrics.com/jfe/form/SV_cAzAvMf7WHDKpjT. Completing the survey would take between 10 and 15 minutes. Please feel free to omit any questions you are not comfortable answering.

Any further correspondence can be sent to any of the following emails with the subject 'Fact Checking Journalist': nkordzadeh@wpi.edu, kmlee@wpi.edu, dkresovic@wpi.edu, srjoubran@wpi.edu, or pjsimpson@wpi.edu

Once again, thank you so much for your time and participation in this study.

Sincerely,
Samantha Joubran
Worcester Polytechnic Institute, 2021
Biochemistry

9.4 : Twitter Fact Checker Questionnaire

We are interviewing fact checkers, like yourself, in order to gain insight from people who are trying to combat fake news. The term 'fake news' in the context of our project is defined as false or partially true information posted with the intent of misleading the viewer. Fact checkers on Twitter are users who try to detect, correct, and combat fake news spread on this platform. Below are a series of questions we have crafted to further understand your fact checking

experience on twitter. We would appreciate any feedback you can give. Feel free to <u>skip any questions you are not comfortable answering</u>.

Q: What is your age?
A: Textbox

Q: What is your gender?
A1: Male
A2: Female
A3: Other

Q: What is the highest level of education you have completed?
A1: Did not complete high school
A2: GED or equivalent
A3: High School
A4: Associate's Degree
A5: Bachelor's Degree
A6: Graduate Degree, please specify_____

Q: For how long have you been fact checking?
A1: Less than a year
A2: 1-2 years
A3: 2-3 years
A4: 3-4 years
A5: Over 4 years

Q: What motivates you to fact check on Twitter?
A: Textbox

Q: How do you choose the tweets which you fact check? Please provide specific criteria if possible.
A: Textbox

Q: How has your personal fact checking experience changed from when you started to now?
A: Textbox

Q: What changes, if any, have you noticed in terms of fake news from previous elections to now? Is it more/less clever, harder to detect, no change at all?
**A:** Textbox

Q: In your experience what is the best way to educate the public about fake news?
A: Textbox

Q: Do you often encounter further interaction with posters of the fake news after you reply with a fact check? If so is it usually positive, negative, or neutral?

A: Textbox

In our previous research, we have learned that fact-checkers like you often reply to users who post fake news (i.e., original poster) with evidence such as a URL referring to a fact-checking article. The following figure shows a real example of a fact-checking activity on Twitter. We have replaced the original poster's username with @user and the fact-checking article URL (the evidence) with URL for privacy reasons.
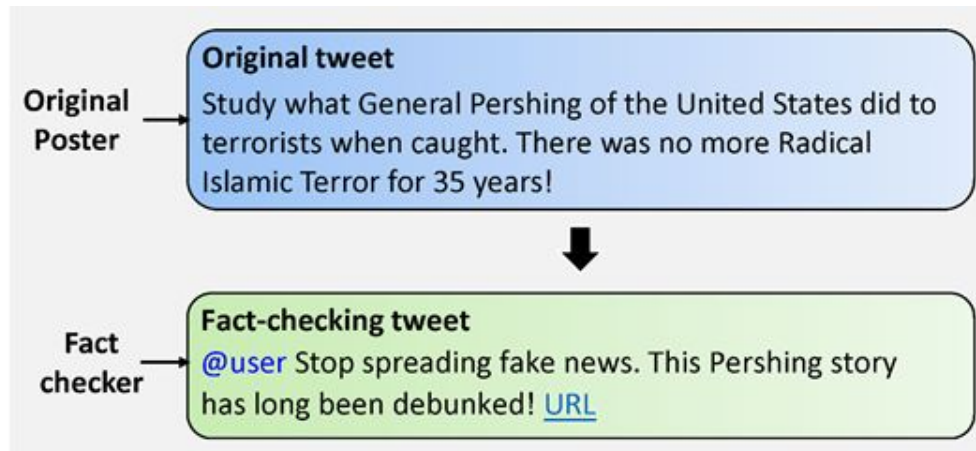
Q: Assume Twitter has decided to implement a fact-checking support system. It automatically recommends fact-checking articles (or URLs) to you, as a fact checker, based on your prior interests such as the topics you have fact checked before. The recommended articles are intended to help you conveniently find and use supporting evidence when fact checking tweets. To what extent, would you consider this recommender system useful and helpful to you?
A: Likert scale 1-4 (1 being not very helpful and 4 being very helpful)

Q: Now, assume Twitter has decided to offer a feature that automatically generates replies to the tweets that contain fake news. Twitter provides the automatically generated tweets to you to make the fact checking process more efficient for you. The automatically generated tweets would be based on your previous posting behaviors and interests. Consider the example in the figure above. The auto-reply generator will provide you with the fact-checking template/reply above without a specific recipient username and fact-checking article page/URL. You would edit the auto-generated tweet by adding a specific recipient username and fact-checking article URL/link. You could also edit the whole auto-generated tweet. Based on this description of the auto-reply generator, how useful do you think this system would be to you?
A: Likert scale 1-4 (1 being not very useful and 4 being very useful)

9.5 : Journalist Fact Checker Questionnaire

We are interviewing fact checking journalists, like yourself, in order to gain insight from people who are trying to combat fake news. Even if you are not a member of the fact-checking team for

your website, please continue with the rest of the survey. We are looking to evaluate people's perceptions about fake news along with their experiences with it. The term 'fake news' in the context of our project is defined as <u>false or partially true information posted with the intent of misleading the viewer</u>. Below are a series of questions we have crafted so that we can learn more about your fact verification processes, challenges, motivations, and experiences. Please answer the following questions as honestly as possible; there are no right or wrong answers. We would appreciate any feedback you can give, <u>feel free to omit any questions you are not comfortable answering</u>.

Q: What fact checking website (this includes websites whose primary function is not to fact checking but have fact checking teams, projects, or departments) are you affiliated with? (If you are affiliated with multiple fact checking websites, please list the one you are most active on below.)
A: Textbox

Q: Are you a member of the fact-checking team for your website?
A1: Yes
A2: No
*If no is selected, the following question appears:

Q: What is your role at the website you work at?
A: Textbox

Q: What motivates you to fact check?
A: Textbox

Q: For how long have you been fact checking?
A1: Less than a year
A2: 1-2 years
A3: 2-3 years
A4: 3-4 years
A5: Over 4 years

Q: What are the biggest challenges you face when fact checking?
A: Textbox

The following questions are about changes with fake news in politics, specifically on social media platforms.

Q: Have you noticed an increase in fake news?

A: (Yes/No)

Q: Have you noticed an increase in public awareness about fake news?
A: (Yes/No)

Q: Has your workload at the fact checking website increased?
A: (Yes/No)

Q: Does your site fact check both liberal and conservative articles or stories?
A: (Yes/No)
*If yes is selected, the following question appears:

Q: If your site does fact check both liberal and conservative articles or stories, please estimate how much of what is shown is liberal versus conservative (please write your answer as a ratio of percent of liberal news to percent of conservative news, ex: 40:60 would mean that 40% of the news is usually liberal and 60% is usually conservative).
A: Textbox

Q: Has the nature of your work changed since the previous presidential election?
A: Textbox

Q: In your experience, what is the best way to educate the public about fake news?
A: Textbox

Assume there is a tool/app that automatically finds relevant web pages and specific paragraphs in online articles related to specific claims that you want to fact check. The resources found by the tool/app will contain fact-verification evidence to support or refute the claim. The tool could reliably and accurately find mixed evidence (some supporting and some refuting the claim) and provide the found information to you so that you can decide on which one to use in the fact-verification process.

Q: To what extent do you think this would be useful/helpful to you?
A: Likert scale 1-4 (1 being not very helpful and 4 being very helpful)

Q: In the space below, please write 3-5 sentences to explain in what ways the app/tool would be helpful to you and the fact-checking team (e.g., saving your time, helping you find better evidence and articles, etc.).
A: Textbox

Q: To support your fact verification process, we, students and researchers, are interested in building a tool/app. We would appreciate it if you could let us know your suggestions regarding what other types of tools would be useful for your fact verification process. Please provide your answer in the space below.

A: Textbox

9.6 : Twitter Fact Checker Survey Data Tables

Age:

Age	
Min	19
Median	50
Max	74

Q: What motivates you to fact check on Twitter?

What motivates you to fact check on Twitter?		
Themes of Responses	**Frequency**	**Example of Response**
The spread of misinformation	8 (53%)	'Constant misinformation from prominent users on the site.'
A desire to spread the truth	6 (40%)	'The pursuit of truth'
No answer	1 (7%)	''

Q: In your experience, what is the best way to educate people about fake news?

In your experience, what is the best way to educate people about fake news?		
Themes of Responses	**Frequency**	**Example of Response**
Increase fact checking activity	6 (40%)	'Expose it'
Teach how to check the reliability of a tweet	4 (27%)	'Teach critical thinking

		in general'
Stop giving attention to fake news after its debunked	1 (7%)	'Media outlets need to stop repeating false claims in detail without a corresponding check of their truthfulness.'
Start fake news education early	1 (7%)	'Start early. Kindergarten '
No answer	3 (13%)	''

Q: How do you choose the tweets you fact check?

How do you choose the tweets you fact check?		
Themes of Responses	**Frequency**	**Example of Response**
Whatever is on the feed	6 (40%)	'I just know that if I see something I feel educated enough to comment about, and I know it to be unfounded, Ill step and engage. I suppose that is how I "choose"'
Seek false information to correct	3 (20%)	'I look for item i believe to be false double check them and correct them with the evidence i find.'
No answer	2 (13%)	''
Searching popular fake news buzz words	1 (7%)	'I choose specific key words that I know are often associate with false info. I also check the posters profile, and if they look like a bot, or someone unwilling to learn, I block them outright. '
Search popular fake new subjects	1 (7%)	'I tend to choose specific subjects that are commonly used by people to support

		their arguments against the other side. '
Depends on the degree of falsehood	1 (7%)	'Usually based on how egregious is the implicit error contained within the tweet. Also on whether the OP is stating the error as a fact. '
Depends on the size of the following of the poster	1 (7%)	'If the claims are made by a person with significant enough following, then I will fact check their claims. That way, I will reach a broader number of people with my arguments. '