Online Information Systems: Who Should be Responsible for Preventing the Spread of Fake News?

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ABSTRACT
The dissemination of "Fake News" online has been deemed as a form of misinformation. This paper utilizes data from a survey of Internet users to compare their perceptions of who should take a great deal or a fair amount of responsibility in preventing the spread of fake news. The three main players concerned with taking additional responsibility in dealing with fake news are members of the public, government, and social networking sites. The users were defined by three demographic variables, and their perception of the amount of responsibility that the three players should have in preventing fake news stories from gaining momentum. The majority of respondents (91%) think that made up news stories hinder Americans. Also, the majority of Americans agree that all three players should be more responsible -public (76%), government (73%), networking sites (76%). The results showed that there is a statistically significant gender difference, females are more likely than males to assign additional responsibility to all there players, regardless of ethnicity and party affiliation. In addition, the results showed that there is no statistically significant difference among Americans based on ethnicity and party affiliation. The one exception is that Democrats are more likely than Republicans to assign additional responsibility to social networking sites.

Keywords: Social media, fake online news, gender, ethnicity, party affiliation

INTRODUCTION
Alternative facts and fake news have had an impact on journalistic content (Himma-Kadakas, 2017), on American citizens' political opinions (Brewer et al., 2013), and triggered an increase in efforts to identify new tools to combat it (Burkhardt, 2017).

Lately, and according to a CNN online report, President Trump had a fake Time magazine cover hanging in at least five of his golf clubs (CNN 6/28/2017). Newsweek (5/24/2017) reported that two thirds of Americans think that the mainstream media publishes fake news. In addition, that a Harvard-Harris poll revealed that 53% of Democrats, 80% of Republicans, and 60% of Independent voters believe that news media publish stories that are not true. The term "Fake News" has become a popular buzzword, especially during the last presidential campaign. Volumes of political news are uploaded and shared daily through social media sites and others online news outlets. It is important to take a closer look at this phenomena, especially since about 4 in 10 Americans obtain their news online (Mitchell et al., 2016). This ratio is higher (50%) for younger adults ages 18-29. During the early days of the Trump administration, 89% of democrats say the news media criticism keeps leaders in line, while only 42% of Republicans feel the same (Barther & Mitchell, 2017). It was reported that in a recent study, there was evidence that 62% of adults in the USA get their news from social media, and the

most popular fake news stories were shared through Facebook (Allcott & Gentzkow, 2017). A survey in the United Kingdom (digiday.com, 2/7/2017), found only 4% of those surveyed were able to correctly identify a story by the headline, and that men identified more stories correctly as true or false. The site digiday.com/uk reported that 49% of Brits surveyed are confident that they can distinguish between fake news and real news stories. According to a survey by the Pew Research Center (Barthel et al., 2016), 84% of Americans surveyed are confident in recognizing a made up news. This same survey found that 16% shared a political news that they later found out was made up, and 14% shared a news knowing that it was made up. The purpose of this paper is to investigate certain aspects of fake news stories such as the perceptions of users as to its impact on others and the degree of responsibility of different players.

METHODOLOGY

Data
The data used in this study were downloaded from the datasets available through the Pew Research Center (http://www.pewinternet.org). This dataset was collected December 2016, includes more than 1000 records, and uses at least 24 variables. The sample includes adults, 18 years of age or older, living in the continental United States. The interviews were conducted by phone, in English and Spanish. The combined landline and cellphone sample are weighted using an iterative technique that matches gender, age, education, race, Hispanic origin and region to parameters from the U.S. Census Bureau's 2014 American Community Survey and population density to parameters from the decennial census. During preprocessing, seven variables were selected as being of interest to the researchers. Four outcome variables relate to the perception of the impact of fake news and who should take more responsibility to counter this trend: members of the public, government, or social networking sites such as Facebook and Twitter. Three demographic variables were also selected, they are gender, ethnicity, and party affiliation. Many researchers consider these three variables as relevant in a political context. Next, all records with missing values were eliminated. Finally, the dataset was reduced to 769 records. Table 1 provides a snapshot of the final dataset used in this study.

TABLE 1
Data By Gender, Ethnicity, And Party Affiliation

	White			Black			Hispanic			Totals
	R	D	I	R	D	I	R	D	I	
Male	100	66	123	0	23	10	8	20	17	367 (48%)
Female	115	98	90	0	42	7	10	23	17	402 (52%)
Totals	215 (28%)	164 (21%)	213 (28%)	0 (0%)	65 (9%)	17 (2%)	18 (2%)	43 (6%)	34 (4%)	769 (100%)

Note: Party affiliation: Republican (R); Democrat (D); Independent (I)

Table 1 above shows zero (0%) for Black Republicans. This could be due to the sampling methodology adopted, and doesn't necessarily reflect the status of the US population. In addition, the majority of the sample is White Americans (77%), with 11% and 12% Black and Hispanic Americans respectively. Also, females make up the majority (52%) of the respondents in this this sample.

Results
The three main players concerned with taking additional responsibility in dealing with fake news are members of the public, government, and social networking sites. The majority of respondents (91%) think that made up news stories hinder Americans. Tables 2 thru 7 were designed through a series of pivot tables. A drill-down OLAP operation using pivot tables

provided a closer look at the respondents in all clusters. The results shown reflect respondents' perception of the responsibility of members of the public, government, and social networking sites respectively. The level of responsibility attributed ranges from a great deal or a fair amount, to not much or not at all. The majority of Americans agree that all three players should be more responsible -public (76%), government (73%), networking sites (76%).

Tables 2 thru 4 use the two dimensions gender and ethnicity. As a first observation, Table 2 shows that the proportions for females and males are 80% and 71% respectively. This may indicate that regardless of the ethnicity, females are more likely than males to assign responsibility to members of the public. In addition, and according to the proportions, Blacks and Whites are more likely than Hispanics to assign responsibility to members of the public. A Z-test statistic revealed a significant gender difference (p-value = 0.00079 < 0.05). But, there is no statistically significant difference based on ethnicity.

TABLE 2
The Public Has A Great Deal To A Fair Amount Of Responsibility

	Female	Male	Total
Black	Proportion= (40/49) = 82%	Proportion= (23/33) = 70%	Proportion= (63/82) = 77%
Hispanic	Proportion= (37/50) = 74%	Proportion= (31/45) = 69%	Proportion= (68/95) = 72%
White	Proportion= (246/303) = 81%	Proportion= (205/289) = 71%	Proportion= (451/592) = 76%
Total	Proportion= (323/402) = 80%	Proportion= (259/367) = 71%	Proportion= (582/769) = 76%

Regarding government responsibility, Table 3 shows that the proportions for females and males are 77% and 69% respectively. This may indicate that females are more likely than males to assign responsibility to the government. This is the case, except for Black ethnicity where males are more likely than females to assign responsibility to the government (79% versus 71%).

In addition, and according to the proportions, there is no clear difference among Blacks, Hispanics, and Whites. A Z-test statistic revealed a significant gender difference (p-value = 0.0041 < 0.05). But, there is no statistically significant difference based on ethnicity.

TABLE 3
The Government Has A Great Deal To A Fair Amount Of Responsibility

	Female	Male	Total
Black	Proportion= (35/49) = 71%	Proportion= (26/33) = 79%	Proportion= (61/82) = 74%
Hispanic	Proportion= (38/50) =76%	Proportion= (32/45) = 71%	Proportion= (70/95) = 74%
White	Proportion= (237/303) = 78%	Proportion= (194/289) = 67%	Proportion= (431/592) = 73%
Total	Proportion= (310/402) = 77%	Proportion= (252/367) = 69%	Proportion= (562/769) = 73%

Table 4 shows that the proportions for females and males are 81% and 70% respectively. This may indicate that females are more likely than males to assign responsibility to social networking sites. This is the case, except for Black ethnicity where males are more likely than

females to assign responsibility to social networking sites (73% versus 69%). In addition, and according to the proportions, Hispanics and Whites are more likely than Blacks to assign responsibility to social media. A Z-test statistic revealed a significant gender difference (p-value = 0.00034 < 0.05). But, there is no statistically significant difference based on ethnicity.

TABLE 4
The Social Media Sites Have A Great Deal To A Fair Amount Of Responsibility

	Female	Male	Total
Black	Proportion= (34/49) = **69%**	Proportion= (24/33) = **73%**	Proportion= (58/82) = **71%**
Hispanic	Proportion= (43/50) = **86%**	Proportion= (29/45) = **64%**	Proportion= (72/95) = **76%**
White	Proportion= (247/303) = **82%**	Proportion= (204/289) = **71%**	Proportion= (451/592) = **76%**
Total	Proportion= (324/402) = **81%**	Proportion= (257/367) = **70%**	Proportion= (581/769) = **76%**

Tables 5 thru 7 use the two dimensions gender and party affiliation. As stated earlier, in the context of gender and ethnicity, here also regardless of the gender and party affiliation, the majority of respondents (91%) agree that fake news impact Americans, and leave them confused a great deal or some. As a first observation, Table 5 shows that the proportions for females and males are 80% and 71% respectively. This may indicate that regardless of the party affiliation, females are more likely than males to assign responsibility to members of the public. In addition, and according to the proportions, democrats and independents are more likely than republicans to assign responsibility to members of the public. Also, and according to the proportions, the gender difference is clearer among the independents. A Z-test statistic revealed a significant gender difference (p-value = 0.00082 < 0.05). But, there is no statistically significant difference based on party affiliation.

TABLE 5
The Public Has A Great Deal To A Fair Amount Of Responsibility

	Female	Male	Total
Democrat	Proportion= (129/163) = **79%**	Proportion= (80/109) = **73%**	Proportion= (209/272) = **77%**
Independent	Proportion= (99/114) = **87%**	Proportion= (105/150) = **70%**	Proportion= (204/264) = **77%**
Republican	Proportion= (95/125) = **76%**	Proportion= (74/108) = **69%**	Proportion= (169/233) = **73%**
Total	Proportion= (323/402) = **80%**	Proportion= (259/367) = **71%**	Proportion= (582/769) = **76%**

Regarding government responsibility, Table 6 shows that the proportions for females and males are 77% and 69% respectively. This may indicate that females are more likely than males to assign responsibility to the government. In addition, and according to the proportions, democrats are more likely than independents and republicans to assign responsibility to the government. A Z-test statistic revealed a significant gender difference (p-value = 0.0041 < 0.05). But, there is no statistically significant difference based on party affiliation.

TABLE 6
The Government Has A Great Deal To A Fair Amount Of Responsibility

	Female	Male	Total
Democrat	Proportion= (127/163) = 78%	Proportion= (76/109) = 70%	Proportion= (203/272) = 75%
Independent	Proportion= (86/114) = 75%	Proportion= (103/150) = 69%	Proportion= (189/264) = 72%
Republican	Proportion= (97/125) = 78%	Proportion= (73/108) = 68%	Proportion= (170/233) = 73%
Total	Proportion= (310/402) = 77%	Proportion= (252/367) = 69%	Proportion= (562/769) = 73%

Table 7 shows that the proportions for females and males are 81% and 70% respectively. This may indicate that females are more likely than males to assign responsibility to social networking sites. In addition, and according to the proportions, democrats and independents are more likely than republicans to assign responsibility to social media. A Z-test statistic revealed a significant gender difference (p-value = 0.00034 < 0.05). Also, there is a statistically significant difference based on party affiliation between democrats and republicans (p-value = 0.04 < 0.05). The results of Table 7 reveal the same trend observed throughout all previous tables. That is, females are more likely than males to assign more responsibility to all players involved. One might speculate that female respondents are more concerned with the damage that fake news stories could create, and that more women than men prefer that all players are involved in identifying a solution.

TABLE 7
The Social Media Sites Have A Great Deal To A Fair Amount Of Responsibility

	Female	Male	Total
Democrat	Proportion= (134/163) = 82%	Proportion= (79/109) = 72%	Proportion= (213/272) = 78%
Independent	Proportion= (93/114) = 82%	Proportion= (108/150) = 72%	Proportion= (201/264) = 76%
Republican	Proportion= (97/125) = 78%	Proportion= (70/108) = 65%	Proportion= (167/233)= 72%
Total	Proportion= (324/402) = 81%	Proportion= (257/367) = 70%	Proportion= (581/769) = 76%

Throughout the results shown above, the analysis revealed that the most informative cluster includes the majority of respondents that perceive made up news stories as leaving Americans confused. Also, White and Hispanic females are more likely to assign responsibility than males. However, Black males are more likely to assign responsibility than Black females. In the context of party affiliation, the clear trend is that regardless of the party affiliation, females are more likely to assign responsibility. These preliminary results have implications that could benefit policy makers, among many others that play a role in managing online information systems and educating the public. The majority of American are concerned with the negative impact of fake news, and agree that member of the public, government, and social networking sites should be responsible for combatting the dissemination of fake news. The solution should involve all three players, and take into account the gender difference, since women are more concerned regardless of their ethnicity and party affiliation.

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