How to Combat Fake News: An Examination of Information Literacy Education

Introduction

The authenticity of information has long been an outstanding concern. On social networks, distorted, inaccurate and false information spreads at such a fast speed that it has tremendous potential for creating significant real-world impacts within a short period of time (Figueira, & Oliveira, 2017). Researchers have been working towards producing more effective detection or filtering technology such as machine learning algorithms and big data analysis that can be applied to social media. While exciting results have been achieved thanks to their contribution, problems remain. Due to the reactive nature of such technology, people creating and providing fake news can still find means to spread fabricated information, thus creating a loop in which those who try to avoid fake news are always playing catch up (Burkhardt, 2017). As Neagu (2019, p.1) stated, "the only way to stop fake news is for you to take responsibility." Therefore, it's important to investigate how to let individuals learn to be critical consumers of news and information.

Unfortunately, information literacy does not play an important role in most social media users' daily consumption of information. According to a survey commissioned by Zignal Lab (2017), of the 74 percent of 2,000 participants aged 18 and older who read news articles that friends have shared on social media, 86 percent of the participants say that they don't fact check the news articles on social media they read, and 79 percent of them indicate that they trust at least some of the news articles shared by friend on social media. Therefore, it becomes crucial for individuals to realize the importance of information literacy and learn necessary skills and knowledge to identify low-credibility information on social media platforms.

While it's tempting to jump to the conclusion that fake news becomes prevalent because their contents confirm the readers' existing bias, many components other than the fake news and readers themselves have to be involved in order to make a piece of fake news convincing. Thus, to combat fake news, we have to spend time and effort exploring the complicated network (which I would like to refer to as the fake news network) constructed around fake news and their potential readers. Authentic and distorted information, recipients of the information, friends and families of recipients, fact checking tools and many other seemingly unnoticeable components all play significant roles in this network. An information literacy program that successfully educates social media users to identify fake news in their daily consumption of information has to capture the presence of all actors in the network and investigate how they interact with each other. Only after understanding the networks of interactions, we may come up with information literacy programs that focus on interactions of specific actors and contain solutions to cut off or regulate those interactions. The following sections will be dedicated to exploring this fake news network, examining existing strategies of identifying fake news and developing insights about what key elements should exist in a successful information literacy program that equips untrained social media users with the skills and the knowledge they need to identify and avoid fake news.

Literature Review

Definition of Fake News

The term "Fake news" seems to be used everywhere in today's society. However, there is no agreed definition of this term and few people bother to give a precise range of information that belongs to fake news. Thus, before we dive into any discussion about fake news, we need to

be clear about what fake news actually is in order to refine the scope of following research and discussion.

Fake news has been defined by some scholars as news articles that are both verifiable false and intentionally misleading. (Shu et al., 2017; Allcott & Gentzkow, 2017) This definition has two key features: authenticity and intent. First, in order to be called fake news, a news article must contain information that can be verified as false. Second, false information in the article should be created with clear intention of misleading or deceiving readers. While this definition seems to capture the essence of fake news, it's generally hard to tell whether the author presents the false information intentionally or not in practice. Since our ultimate goal is to identify fake news, we will place more focus on the authenticity of information and not be bothered by the intention too much. An alternative definition of fake news is proposed by some scholars who focus on listing what fake news is not. Ireland (2018) suggests that fake news is not just bias. It's neither an adequately labelled opinion piece, nor a piece with logical fallacies. The term fake news should only apply to pieces that intentionally ignore, distort, or fabricate facts. Fake news is similar to yellow journalism in the 1890s, which does not contain truth and facts are missed or twisted (Mott, 2013).

Exploring the Fake News Network

On the one hand, research has been conducted to develop networks that depict and analyze the interactions among different entities in the spread of fake news on social media. Scholars such as Talwar (2019) believe that a number of components play important roles in presenting fake news on the readers screens and making them believe and share those distorted information. Actor-network theory (ANT) has been used intensively to examine major social

events in which fake news plays an important role. For example, Pantumsinchai (2018) uses actor-network theory to investigate how acts of mob justice, including "rampant speculation", "rumor-mongering", and "false accusations and harassment of innocent suspects" (Pantumsinchai, 2018, p.761), happen in the 2013 Boston bombing and the 2015 Bangkok bombing. In the paper, Pantumsinchai examines how fabricated and misleading claims "move through a network comprised of media coverage, police statements, and social media channels" (Pantumsinchai, 2018, p.767) and are eventually constructed as truth or convincing reasoning through networks of interactions. Two types of networks, "blackboxed" and "the feedback loop" (Pantumsinchai, 2018, p.767), are introduced in the paper. Through blackboxed, Pantumsinchai first demonstrates what a stabilized network should look like and how claims made online flow through this network and are accepted as truth by the vast majority of social media users. Then the author uses the second network, the feedback loop, to illustrate the relationship between traditional news media and communities formed by social media users. Eventually, the author concludes that in order to be viewed as truth, a claim must have a strong network backing it. The "truth" itself needs the network of actors to maintain its truthfulness. "The truth is as truthful as we want it to be" (Pantumsinchai, 2018, p.778).

Similarly, Johnson (2018) analyzes how interactions among actants such as "the online proliferation of fake news" and "accusations of fake news lodged by the state against the press" (p.100) radicalize people and trigger acts of terrorism beyond rationales of self-interest, which eventually lead to the Unite the Right rally in Charlottesville, Virginia in 2017. In his article, Johnson argues that the paranoia that radicalizes people does not originate from individual pathology. Rather, it is networked by state and nonstate actors, and fake news becomes an

important actor in this network. However, while fruitful research has been conducted to study the fake news network in the context of specific events, limited research has been done to study the fake news network in the more general case.

Strategies and Tips for Identifying and Avoiding Fake News

On the other hand, there are scholars who have proposed information literacy strategies about identifying fake news which are both useful and easy-to-learn for untrained social media users. Burkhardt (2017) and Davis (2016) have included some information literacy tips that people should keep in mind in their daily consumption of information and usage of social media. They analyzed the functionality of each method by identifying some key actors that play significant roles in spreading or stopping fake news. Based on those instructions, information recipients can regulate their interactions with other entities in the fake news network. Some of the methods are selected from their work and organized into Table 1.

Table 1

A Selection of Information Literacy Methods and Reasons Why They Make Sense

Name	Reasoning
Be Careful about Friend Requests	The accounts that send friend requests might be controlled by social bots, which are programmed to "gather and spread misinformation or disinformation" (Burkhardt, 2016, p.22).
Read before Sharing	One big reason why fake news spreads and gains popularity is that people share the articles and news "without having read beyond the headline or without thinking about the content of the message" (Burkhardt, 2016, p.23).
Leave the Filter Bubbles	Overcoming our confirmation bias and comparing sources that illustrate different perspectives will often help us find the "middle ground" where the truth often lies.
Check the Comments	If a reasonable amount of comments call out an article or a piece of news for presenting distorted information or being

	misleading, we need careful fact-checking before believing.

In their work, detailed instructions are also provided for readers to practice these methods in their daily consumption of information. For example, Burkhardt (2017) lists signs for suspicious accounts so that social media users can look for these signs before accepting friend requests:

- Accounts without profile pictures, with low number of Tweets or shares and accounts that follow a significant amount of accounts but only have few followers in comparison are likely to be social bots.

- If an account replies to your Tweet within a second of a post, it's likely to be automatically programmed.

- If an account gains a large number of followers in a short period of time for no reason, then it's likely that bots are involved. At least some of these newly gained followers might be bots.

- The ultimate rule of thumb is to never accept friend requests from people you don't know in real life. However, this rule is often compromised as for platforms such as Twitter and Tumblr, connecting with strangers is one of the main features.

Innovation in Information Literacy Education

While the above traditional digital literacy methods are by no means outdated, there have also been research in combating fake news in a more innovative and proactive way. The philosophy behind such research is that since low-credibility sources keep coming up with new ways of catching people's eyeballs on their articles and news, in order to keep up with the "development"

of fake news, more innovative ways are certainly needed to educate people about the importance of digital literacy and how to identify and avoid fake news. Ireland (2018) came up with a project that delivers information literacy education through memes. His main observation is that fake news today heavily relies on "imagery and attention-grabbing headlines" (Ireland, 2018, p.122). Therefore, when false information is integrated into entertainment, it becomes very hard to combat fake news using traditional information literacy strategies because people may not even realize they are absorbing information -- they think they are just having a good time!

In this situation, one of the most effective tools that people can use to recognize disinformation and limit its spread is creativity. In Ireland's article, memes "do not necessarily have to be an image or video to be visual" (Ireland, 2018, p.122). In order to incorporate memes into information literacy programs, memes need to convey visual information that is easy to digest for the viewers, and will catch and keep their attention. The biggest advantage of memes, argued by Ireland, is that they can connect with social media users on the same level that fake news does and they persist longer in viewers' mind than written guidance. The key to the success of fake news is that it must be able to attract people's attention in a short amount of time, which is also the essential element of a successful meme. Creativity is the indispensable component in designing a successful meme. In order to thrive in the meme pool and reappear in people's daily online surfing, a meme must have brilliant ideas incorporated into its design. Otherwise, it will vanish and be forgotten in a blink of an eye. As Gleick (2011) explains memes, "they compete with one another for limited resources: brain time or bandwidth. They compete most of all for *attention*" (para.11). Compared to traditional digital literacy methods which are more like a series of tedious tasks that readers have to bear in mind before or after using social media and

reading news articles, memes have the capability of conveying important messages in a more entertaining way. Therefore, in this case, memes become counterforce to fake news as they can compete with fake news for viewer's attention and deliver digital literacy methods for identifying and avoiding fake news through the competition. Moreover, for a specific population, memes can better fit into the culture of this population and thus form a much stronger relationship with its people than generic information literacy education guidance, which is designed to fit all populations. The strong connection between memes and the readers will influence the readers profoundly and equip them with the skills and knowledge to identify fake news.

Diversity in Information Literacy Education

While Burkhardt (2017) targets the recipients of information literacy education as new generations, who are mostly students, the specificity in Burkhardt's approach reveals the diversity in both how people tend to receive information and how people interpret fake news. The news literacy project proposed by Ireland (2018) takes the cultural diversity of different populations into account so that memes can be appropriately designed to target different groups of people. Matteson and Gersch (2019) also suggest that, instead of applying the same education prototype to all people, information literacy educators should employ different theoretical understandings that describe and support information literacy when targeting different groups of people. For example, young generations, namely Millennials and Gen Z, should be the main focus of digital literacy education as they tend to spend significantly more time on social media than their parents, use social media as their primary sources of news, and thus are more likely to become potential victims of fake news. According to Zignal Lab (2017), about 68 percent of

Americans aged between 18-34 use social media or online news sites as their main sources of information. Moreover, 46 percent of this age group indicate that they are likely to share a news article shared by another friend on social media. Hence, to effectively limit the spread of fake news, young people must be equipped with information literacy knowledge. The good news is that actions have already been taken to educate younger generations. For example, California State lawmakers have introduced new high school media literacy curriculum standards to help students distinguish fake news from truth (Yuhas, 2017). Similar actions need to take place nationwide to support information literacy programs that target different groups of the population.

Discussion

As stated by Pantumsinchai (2018), fake news has to move through a network of beliefs, discourses, statements, institutions, and humans to be perceived as facts. When the network is robust and stabilized, fake news can easily spread out, gain popularity among people, and even become so-called "common sense". In order to combat fake news, we need to figure out ways of destabilizing or even disassembling the network through which fake news flows to become factual. While numerous information literacy methods exist, they can generally be categorized into two categories: regulations on the interactions among actors in the fake news network and introduction of new information and new actants to the network.

Regulations on Interactions

Regulations will block the flowing path of fake news inside the network. When fake news cannot move through the network, there is no way it can come out of the blackboxed network as "facts". One example of digital literacy strategies that regulate the interactions in the

fake news network is the "Be Careful about Who You Friend on Social Media" principal

mentioned in Burkhardt's work. It focuses on the interactions between the potential recipient of

fake news and his/her friends on social media. When the recipient accepts friend requests from

strangers on social media, he/she makes a psychological transition from regarding the requesters

as strangers to regarding them as friends. Even if the recipient knows absolutely nothing about

the requestor, after accepting their requests, they become "friends". It means much more than

seeing them appear on the friends list. Such a psychological shift will result in a certain amount

of trust between the recipient and requestors. In the recipient's view, those requestors have

access to the inner circle of information in the recipient's life. Everything the recipient does on

social media becomes accessible to the requesters and they are also connected to the recipient's

friends and families. As a result, the fact that requesters and the recipient become "friends" on

social media adds plausibility to the information shared by requesters. However, it may never

occur to the recipient that those seemingly real requesters are bot accounts programmed to gain

trust from social media users and spread disinformation. On average a low-credibility source

published approximately 100 articles per week on twitter (Shao et al., 2018). Social bots run by

the low-credibility source then share and distribute these articles, targeting those who are most

likely to believe them in their friends lists, and taking advantage of their tendencies to attend to

what appears popular, to trust information in a social setting, and to trust social contacts (Jun et

at., 2017).

From the illustration above we can see that people lower their cautions about the

authenticity of information when they know that the information was shared by their friends on

social media, and such trust provides an easy path for fake news to spread out and reach a larger

population. The "Be Careful about Who You Friend on Social Media" method aims at teaching social media users how to detect accounts that are likely to be social bots and thus reject their friend request or at least mark these accounts as untrustworthy. In this way, social media users will be less likely to receive information shared by bot accounts, and even when they do receive such information, since these accounts are already marked as untrustworthy, users will do additional fact-checking to ensure the authenticity of the information. When the interactions between social media users are regulated, there is less space for fake news to be transmitted from individual to another individual and gain popularity. Hence, the fake news network is destabilized and it is harder for fake news to move through the network and deceive people.

Introduction of New Actants and New Information

Compared to regulations on interactions, introduction of new actants and new information is much easier to comprehend. When new actants and new information enter the network, they will bring in new interactions and change the structure of the network, causing the network to destabilize or collapse and unraveling the fake news to be fabricated or distorted. One example of introducing new actants and new information into the fake news network is the usage of fact-checking tools and websites. When people fact-check a fake news article they read, fact-checking tools are introduced into the fake news website and they might bring in information that are the exact opposite as the one contained in the fake news article. The information offered by fact-checking tools causes disruptions to occur inside the network. When disruptions become strong enough, which corresponds to the scenario that readers gather more and more information from fact-checking tools and form their own judgement based on the

information gathered, the fake news network collapses and fake news fails to convince its readers.

Thoughts on Information Literacy Program

After categorizing existing information literacy strategies, we can conclude that a successful information literacy program should capture following elements:

- methods that implements regulations on interactions among actors in the network
- methods that introduces new actants and new information into the network
- knowledge that are easy-to-digest and presented in creative and eye-catching ways
- thorough consideration of the diversity of the population and different design philosophy for different culture

While thrilling progress has been achieved in making information literacy accessible to untrained social media users, there's a lot more work to do to equip everyone with proper skills to combat fake news. Existing information literacy projects mainly focus on social media. Thus, these projects usually work less effectively with people such as senior citizens who usually don't rely on social media as their primary sources of information. Hence, it's crucial to come up with projects that target traditional media to involve more people into the combat against fake news. Also, since some information literacy methods such as analyzing domain and URL require a certain amount of technological knowledge, education to categorize methods of identifying fake news based on the degree of required technological knowledge and take this difference into consideration while delivering information literacy knowledge.

References

Allcott, H., & Gentzkow, M. (2017). Social Media and Fake News in the 2016 Election. *Journal of Economic Perspectives*, 31, 211–236. doi: 10.3386/w23089

Burkhardt, J. M. (2017). *Combating fake news in the digital age* (Vol. 53). Chicago: American Library Association.

Davis, W. (2016, December 5). Fake Or Real? How To Self-Check The News And Get The Facts. Retrieved November 5, 2019, from https://www.npr.org/sections/alltechconsidered /2016/12/05/503581220/fake-or-real-how-to-self-check-the-news-and-get-the-facts.

Figueira, Á., & Oliveira, L. (2017). The current state of fake news: challenges and opportunities. *Procedia Computer Science*, 121, 817–825. doi: 10.1016/j.procs.2017.11.106

Gleick, J. (2011, May 1). What Defines a Meme? Retrieved March 6, 2020, from https://www.smithsonianmag.com/arts-culture/what-defines-a-meme-1904778/

Ireland, S. (2018). Fake news alerts: Teaching news literacy skills in a meme world. *The Reference Librarian*, *59*(3), 122–128. doi: 10.1080/02763877.2018.1463890

Matteson, M. L., & Gersch, B. (2019). Unique or ubiquitous: information literacy instruction outside academia. *Reference Services Review*, 47(1), 73–84. doi: 10.1108/rsr-12-2018-0075

Johnson, J. (2018). The Self-Radicalization of White Men: "Fake News" and the Affective Networking of Paranoia. *Communication, Culture and Critique*, *11*(1), 100–115. doi: 10.1093/ccc/tcx014

Jun, Y., Meng, R., & Johar, G. V. (2017). *Perceived social presence reduces fact-checking*.

    Proceedings of the National Academy of Sciences, 114(23), 5976–5981. doi:

    10.1073/pnas.1700175114

Mott, K. (2013, February 13). Yellow Journalism - Present and Past. Retrieved November 4,

    2019, from https://www.americanhistoryusa.com/yellow-journalism-present-and-past/.

Neagu, S. (2019, March 4). The only way to stop fake news is for you to take responsibility.

    Retrieved November 5, 2019, from https://thenextweb.com/contributors/2019/01/12/

    the-only-way-to-stop-fake-news-is-for-you-to-take-responsibility/

Pantumsinchai, P. (2018). Armchair detectives and the social construction of falsehoods: an

    actor–network approach. *Information, Communication & Society*, *21*(5), 761–778. doi:

    10.1080/1369118x.2018.1428654

Shao, C., Ciampaglia, G. L., Varol, O., Yang, K.-C., Flammini, A., & Menczer, F. (2018). The

    spread of low-credibility content by social bots. *Nature Communications*, 9(1). doi:

    10.1038/s41467-018-06930-7

Shu, K., Sliva, A., Wang, S., Tang, J., & Liu, H. (2017). Fake News Detection on Social Media.

    ACM SIGKDD Explorations Newsletter, 19(1), 22–36. doi: 10.1145/3137597.3137600

Talwar, S., Dhir, A., Kaur, P., Zafar, N., & Alrasheedy, M. (2019). Why do people share fake

    news? Associations between the dark side of social media use and fake news sharing

    behavior. *Journal of Retailing and Consumer Services*, 51, 72–82. doi:

    10.1016/j.jretconser.2019.05.026

Yuhas, A. (2017, January 13). California lawmakers propose bills to teach students to identify

    'fake news'. Retrieved March 6, 2020, from

https://www.theguardian.com/us-news/2017/jan/12/california-lawmakers-propose-bills-to

-teach-students-to-identify-fake-news

Zignal Labs. (2017). *A report on the spread of fake news* [Data sets]. Retrieved from

http://go.zignallabs.com/Q1-2017-fake-news-report