Informational Apathy: The Impact of the Information Age

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Introduction

As the information age progresses, fact-checked, high-quality information and news is increasingly being drowned out by misinformation and disinformation. This rising tide of information disorder manifests as increasing public distrust of news sources, both traditional (news channels), and emerging (social media), despite increasing viewership and readership. (Shearer & Matsa, 2018) Social media companies build their machine learning-driven news feeds around metrics of "meaningfulness" and view time, as opposed to veracity. (Tien, 2018) 24-hour news channels eschew journalistic integrity in favor of fast turn-around time and attention-grabbing headlines. ("How News Has Changed," 2017) The effects of this public distrust are correlated with a rise in political polarization in the US, and a rise of "echo-chamber" communities such as conspiracy groups and radical political organizations, groups characterized by the exclusion of certain popular assumptions or facts. As public information sources change, it is important to understand how those changes affect the population.

At the time of writing, Facebook serves 2.37 billion users, with 1.56 billion reading Facebook daily. (Hutchinson, 2019) These numbers make social media sites, Facebook in particular, the largest single sources of news in the world, supplying around 1/4 of the world population with information of some kind. Combined with the highly personalized information that algorithmic news feeds such as Facebook's present, these feeds present a significant new potential source of misinformation and bias. It is unlikely that the engineers that build these models fully understand them, a known problem with complex machine learning models; it is even less likely that the end-users and content creators affected by the decisions these models make understand them, given their closed-source nature. (Bleicher, 2017)

Meanwhile, traditional news sources, like the *New York Times* and the *National Review*, under competitive pressure from new-generation start-ups such as *Buzzfeed* and *Pocket,* increasingly adopt "new" reporting strategies in order to keep readership up, frequently diluting otherwise factual and straightforward news sources with entertainment articles. (Fisher, 2014) Politically leaning news networks such as CNN and Fox News are almost completely distrusted by viewers of the opposing party. (Guskin, 2018) Trust in mass media in general has steadily declined over the past five decades, from 72% in 1977 to 41% in 2019. (Brenan, 2019; Inc, 2019) Trust in the US Government is down from 73% in 1958, to 17% in 2019, reflecting a general distrust in institutions and information sources that were previously considered authoritative. (NW et al., 2019)

In a world where the amount of information the average person takes in every day keeps increasing, it is imperative to understand *how* people get and take in information, and who is responsible for the veracity and quality of that information. With political apathy on the rise , and an increasing amount of chaff among the wheat, more people are becoming less likely to consume information in general. (Graham, 2019; Oxenham, 2017) This environment of closed-mindedness, mutual distrust, and willingness to remain selectively uninformed poses a real danger to not only democratic society but informed populations in general.

Research Question & Methods

This paper is a set of case studies and a review of existing research on how new and transforming information sources affect "informational apathy" - the tendency of a person to avoid seeking out quality information because the signal-to-noise ratio in many popular information sources is so low - specifically in the context of social media news feeds, modern cable news and reporting organizations. The question is whether informational apathy can be

controlled and ameliorated, what steps individuals, companies and regulatory bodies can take to do so, and who is responsible for taking those steps.

Much of the language used in this paper is informed by the Council of Europe commission in information disorder. (Wardle & Derakshan, n.d.) This report defines "misinformation" as false information shared unknowingly or without intent to cause harm, while "disinformation" is false information shared to deliberately cause harm. Sources collected and analyzed are historical, covering the transition from a newspaper-dominant informed society to a video-dominant informed society, data on public trust of news sources, what little information can be found on the inner workings of social media feed algorithms, and reports on the inner workings of news channels.

Background

Social media has been growing as a news source; social media was adopted more quickly than any other information technology, rapidly approaching 80% usage in 2018 since its inception in 2005, and currently approaching a 70% usage rate among users as a self-described news source. (Mohan et al., 2016) While television still dominates, with usage amongst US Citizens as a news source hovering at around 50% of the population, the picture becomes clearer when stratifying by age; social media and news websites dominate as the most used news source in people between ages 18-29, while news websites, television, radio and social media hold roughly equal importance for ages 30-49. It is only at ages 50+ that news channels begin to take over as the most-used news source. (Shearer, 2018) This shows that television is the most significant news source for older populations, while social media *is becoming* the most significant news source for younger populations, with news websites and news channels trailing

behind; it also serves as a convenient division between “traditional” and “emerging” news sources.

Due to the clear significance of television as a current news source, and with social media and news websites rising in importance, these three sources of information will be focused on, compared and contrasted throughout this paper.

For social media, this paper will focus on Facebook as both the archetypal and most used social media website in the world. However, most statements made about Facebook can be generalized to other similar social media websites; YouTube, Twitter, WeChat, WhatsApp and Tumblr for example all present the user with a news feed as the homescreen, and allow for similar interactions (posting, liking, commenting, reactions, private messages) between users to Facebook. These different services differ primarily in the content they deliver (videos, pictures, theme of content); the way they deliver it is nearly identical.

Social media news feeds are governed by proprietary feed algorithms that curate content for each individual user. As users browse the website, these machine learning algorithms, based on how long users spend viewing or reading a piece of content, how they interact with it (commenting, liking, etc.), will choose to recommend similar pieces of content in the future. (Tien, 2018) This is a content-based recommendation system. Additionally, there are collaborative filtering recommendation systems, which look at what content a user’s friends and other connected users have looked at recently, and recommend similar content under the assumption that a person will be interested in similar things to their friends. Most commercial systems appear to use combination of these methods.

A known problem with these personalized recommendation systems is the creation of filter bubbles, also known as echo chambers. These social phenomena are the result of users, often inadvertently, manipulating the recommender system so that it shows them only information that confirms their existing prejudices. This tends to result in more closed-mindedness as viewers and readers see only the opinions of like-minded individuals, and in extreme cases result in radicalization, formation of conspiracy groups, or cult-like behaviour. Filter bubbles are a specific form of confirmation bias, with similar behaviours and effects to this classical psychological behaviour. (Nickerson, 1998) Models by Michela et al. have shown that the most significant factors in misinformation spread on social media are homogeneity and polarization within a subpopulation, features that define a filter bubble. (Vicario et al., 2016) Recommendation system designers are aware of this problem, and continuous (albeit ineffective) attempts have been made to solve this problem since the early days of social media. (Manjoo, 2017)

On the more traditional side, news channels and websites have also evolved over time, becoming better tools for their stakeholders. When journalism and news organizations were first created, they were intended as a public service; like a library, cable news and periodicals were ways of informing the public, providing facts that people could form opinions, have discussions, and make decisions from. Since the mid 1980s, profits increasingly became the focus as news networks were bought by big entertainment companies; this had the side-effect of layoffs, as documentary divisions and foreign bureaus were cut to improve the bottom line. With the rise of market analysis and big data, advertising companies were able to hone in their target audiences and further improve this bottom line, as well as heighten the demand for viewer time and large audience numbers. Combined with the 24-hour news cycle, little time is allotted for verification

and vetting, with distorted, inaccurate broadcasts made based on incomplete reports. (Ladd, 2016b)

This boom in television advertising value had an important side-effect of significantly reducing the sustainability of print news sources, with newspapers becoming all-but-extinct and many periodicals shifting much of their focus to website-based reporting, much of their ad revenue coming from banner and margin ads on web articles, or paywall-based subscription services restricting the number and kind of articles a person can read. What few print companies remain have had to make significant cuts to the quality of their writing in order to stay afloat, laying off editors and fact-checking divisions. ("How News Has Changed," 2017)

STS Framework

The question of informational apathy's origin, control and of which parties are responsible for it will be analyzed through the lens of the paradigm shift framework. Established by Thomas Kuhn, this framework focuses on how extraordinary research leads to radical changes in a field of research or science. (Kuhn et al., 1994) While Kuhn originally intended this framework to apply specifically to natural sciences, and maintained despite criticism that it applies exclusively to natural sciences, it can be applied more generally to changes of patterns in groups of people; in this case, to highlight the contrast between the patterns of the internet and prior sources of news, facts and opinions.

A common criticism of Kuhn's paradigm shift framework is that it highlights the "radical shift" aspect of a paradigm shift too much; that radical changes are rare and exceptional circumstances that result in "revolutions" in the status quo, as opposed to a common occurrence that gradually happens over time. While this could be argued from a purely social science standpoint, from the perspective of science and technology, things become more complex.

Revolutions often occur in the technology available to a social group, or in fundamental changes in the theories that a social group uses to understand the world. In the case of natural sciences, excellent examples would be the discovery of DNA, or the particle collider; in the case of the information age, the technologies that drive social media, such as high-performance smart phones and server cloud technology, and the institutionalization of pseudo-anonymity as an acceptable mask for political tribalism, would be examples of underlying revolutions that have caused gradual changes in the status quo.

Kuhn also restricts the paradigm shift framework to focus on radical changes that result in a *better* status quo, following the paradigm shift. In order to treat modern media fairly, both its benefits and evils must be analyzed; with the birth of any new standard or norm, something is left behind, and something must be lost. New is often mostly good, but never all good. This criticism applies to Kuhn's original definition of paradigm shift; with every change, there may be some drawbacks. In a gross, sweeping, subjective analysis of most scientific fields, it could be argued that science has gotten "better" over time, but this neglects the small tools and procedures that have been lost along the way, and the tradeoffs made in replacing those artifacts with more "modern" alternatives.

Results and Discussion

The changes in the way news is made available that have happened over the past 4 decades have resulted in a wide-reaching array of effects on the way people process news and facts. The increasing dilution of ad-revenue-focused news channels, a far cry from their truth-focused journalistic ancestors of the mid 1900s, have driven the younger generations to seek alternative sources of news, while older generations become more and more polarized by reporters that value entertainment over objectivity. (Guskin, 2018; Ladd, 2016a)

The alternative sources, however, are no better. Due to the infancy of recommendation systems and the lack of accountability surrounding machine learning algorithms due to their black-box-like "data in one end, predictions out the other" nature, there is a significant lack of verification or vetting on online platforms, where user engagement is, similarly to news channels, valued over veracity of information. The situation is worsened by the content-focused nature of social media; any user can create a post, which will be equally valued to any other. While this has fantastic, highly beneficial implications for freedom of speech, it is a double-edged sword, as the quality of information is no longer guaranteed. This is reflected in surveys of trustworthiness regarding social media as a news source, with numbers dipping as low as 10% of respondants trusting Facebook, with numbers increasing to only 30% of respondants trusting a much more business-focused (and less popular) website like LinkedIn. (Swanson et al., 2017)

This ever-increasing noise-to-signal ratio on both fronts - filler content in news channels, and poorly informed, popular-but-unverified viral content on social media - is the root cause of informational apathy. Trust seems to decline *as* information sources spike in popularity; the effort required to step away from an article or a video to check sources that aren't listed at the bottom of a post, in the description of a video, or at the end of a broadcast can be too much for a journalist or researcher to take, let alone the average information consumer. As a result, consumers either make a judgement call as to whether or not a piece of information *seems* correct before opting to include it as a fact in their worldview, or simply cease seeking news altogether, choosing instead to ignore major world events or create their own artificial canon regarding the state of the world. In extreme cases, this results in the formation of conspiracies.

Informational apathy has caused an inversion of informational desire in the population. In decades and centuries past, information was a sought-after commodity. Letters, town criers and

eventually the radio and television provided a much-valued source of facts and information, a view into the world beyond one's home. In a world isolated by primitive technology, people valued what few connections they had to the current events of the outside world. Now, seeking out and finding valuable information is a dreaded task for many, with political apathy increasing and measures of misinformation or informational ignorance higher than ever; a commonly cited example being that only 1/3 of the US population can name all 3 branches of government. (Ladd, 2016c; Oxenham, 2017) Deficiencies of knowledge and the spread of misinformation are well documented by academia. (Kuklinski et al., 2000) While it is not an old problem, there is a certain irony in the advent of the information age exacerbating the democratic issue of a net-uninformed voting age population. Just as the invention of cars caused an increase in deaths due to car crashes, there is danger in allowing highly popular services dealing in information to go unregulated. Just as both the people and the government have a say in vehicle safety standards, these same parties should have a say in regulating services that inform whole populations.

There have been many attempts to curb information disorder. Facebook contracts out to, as of this writing, six different fact-checking partners, such as PolitiFact and Fact-Check.org. Between these partners, 200 flagged posts are checked every month by staff. (Mali, 2020) While it is likely that these partners are able to address the most significant pieces of misinformation, this number of checked posts pales in comparison to the sum 800,000 Facebook posts every minute, summing up to 34 billion posts a month; Facebook's partners are able to check one in every billion posts, between the ~40 individuals spread between partners. (Noyes, 2020) So, while these fact-checking organizations may be able to shed light on major political misinformation and disinformation, informing some public debate, these organizations in no way

have an impact on the average Facebook user, and the information they see in their feed. Twitter has begun experimenting with a similar flagging mechanism. (Rodrigo, 2020)

Clearly, using staff to fact-check an even remotely significant fraction of social media posts is completely infeasible. One would have to employ (if each person checks 5 posts a month), 8 billion fact checkers. There have been attempts by researchers and third parties to automate or distribute the work of fact-checking. Examples include the SurfSafe, which checks for doctored images and videos; and TrustedTimes, which checks for the veracity of a news source and rates the partisanship of said source. (*Trusted Times*, 2017; Vincent, 2018) While effective in theory, these plugins have an adoption rate problem. With only 2,592 and 476 total users respectively, at the time of writing, these services show no signs of wide-spread adoption, despite having been released as early as 2017. Low adoption rates are suspected to be due to tech literacy issues; most users of browsers are unaware of browser extensions, what benefit they might provide, or how to install them; there is evidence that technologically illiterate individuals are also most likely to benefit from such a service. (Hern, 2019) Pennycook et al. were able to show that crowdsourcing ratings pieces of information (asking users to rate the trustworthiness of a source) was particularly effective when users who were *unfamiliar* with a particular source (and hence unbiased) were able to rate sources. (Pennycook & Rand, 2019) This is, however, research, and not a deployed system that could have an effect on an audience, though the demonstration of the concept may inform future such systems.

There have been attempts to censor and flag social media content automatically by platforms. YouTube has recently changed their recommendation algorithm, removing what the company calls “borderline content” from feeds; which, according to the company, has reduced the viewership of conspiracy theory videos and misinformative content by 70%. (Board, 2019;

Cooper, 2019) By this statistic, YouTube's algorithm is one of the most successful in curbing misinformation; however, YouTube's recommender systems have their own problems, including demonetization of smaller channels, and channels covering topics deemed "too controversial" for advertisers (such as LGBTQ or "queer" content and content related to the Hong Kong protests), inherently reducing the success of those channels. (Oremus, 2019; Romano, 2019) Furthermore, there is no independent verification that this statistic is accurate, or even a detailed explanation of what a "borderline" video is, reducing the meaningfulness of such a statistic. There are also concerns that, as with any human-made system, there will be inherent bias that eliminates videos that, while containing no facts, still contain valid opinions. ("YouTube 'Fact Checks' Videos Skeptical of Man-made Climate Change," 2018) Social media companies are private organizations, and so have a right to censor whatever information they want, at least by US law; however, due to the increasing role they play as a public platform for discussion, free speech concerns will likely come into play, the same way soft censorship by internet service providers has been a recent concern.

This case shows that machine learning models can be designed to cut misinformation, albeit not perfectly. Furthermore, looking at numbers alone, automating this process is a more effective way of changing the information an audience sees than hand-labeling, at least, when that hand-labeling is done by small groups of professionals. Crowd-sourcing may be used in conjunction with or independently of these automation methods, potentially increasing the amount of labeled data and the effectiveness of the models, but also introducing a potential source of mislabeled data. Importantly, the effectiveness of these systems depend on their accessibility; in terms of individuals affected, more obscure services such as browser plugins, despite what their effectiveness may be, are incapable of reaching a large enough audience to

have a significant effect. Whereas implementing changes to feed algorithms themselves prevent the spread of misinformation in the first place, eliminating a need for after-the-fact verification, reducing the need for source checking, which 86% of US adults over 18 do not do, or debiasing, which has been shown to be ineffective; once an individual is biased, they often remain biased. [Lewandowsky et al. (2012); brownOut10Americans] In particular, YouTube's solution of eliminating "borderline" videos may speak to a broader solution of ranking content not just on popularity or "meaningfulness," but also on both crowd-sourced machine-evaluated veracity.

Solving the misinformation and disinformation problems are more difficult in the case of news channels. Most misinformation present on social media originates from users, and the rate at which it spreads and is seen by other users can be plainly (if not easily) regulated by the company providing the service, and the user, albeit less easily. When misinformation appears on a news channel, there are no checks to be made by a concerned user base; information is delivered directly to viewers, and cable news judges its effectiveness as a service by viewership. Unlike with social media, where the means for the user base to express concern is built into the platform, and appears to result in change, even if it is gradual and often ineffective. In the case of news channels, viewers can call the organization, but largely have no control over what airs on a news channel. Unlike social media, there is no tweak to be made or service change, no technology that can effectively regulate news channels. Furthermore, while changes to social media networks can occur gradually, quietly distancing users from misinformation, viewers of news channels are unlikely to move to an alternate channel due to the severe distrust viewers of one news channel frequently have of others. (Panetta, 2019)

An important question must be asked; are improvements to social media platforms, news channels and verification systems just a technological fix? (Mitcham, 2005) While feed

algorithms can certainly be improved, and mechanisms put in place to provide additional information to readers and viewers or reduce exposure of viewers and readers to radical or objectively false information, it is in the nature of social media feed algorithms and news channels to exploit confirmation bias, and the human draw to sensationalism. (Anand, 2017; Solon, 2017) While the companies that run social media platforms are most able to change the way they deliver content, it would be irresponsible to assume that every source will make the decision to deliver more truthful, less harmful content; or that there is even a valid universal metric to judge the quality of content. It is important to also consider the ways in which western society might change over time to become more resilient to misinformation and informational apathy; and ways in which governments may regulate social media content and news channels to improve public trust in institutions.

As previously established, an overwhelming majority of the US voting age population does not check the sources of articles and social media posts they read. Regardless, it appears that encouraging readers to check sources has historically been an ineffectual way of reducing the level of misinformation within a population. It can also be concluded from established sources on confirmation bias and debiasing that changing the patterns by which a society consumes information are difficult. Changes tend to be reactive (the shift to social media as a news source in younger populations in reaction to the entertainment-focused nature of news channels) as opposed to proactive (checking sources of an article to ensure that one is not misinformed). While an obvious solution to this problem of a misinformed/uninformed population would be “establish a culture of source checking,” the US school system already attempts to do this and has been clearly unsuccessful. An argument could be made for increasing science and technology literacy within the population, however, studies by Kahan and Dudo

establish that the “deficit model” that many academics believe in - that the average person makes poor decisions regarding science and technology policy because they are scientifically illiterate - is false. (Dudo & Besley, 2016; Kahan, 2010) Increasing the scientific and technological literacy of a population will not change beliefs regarding the importance of information veracity and level of trust in facts. An element of pathos is necessary to effect changes of opinions, regardless of the factual basis of information.

Should it then be the responsibility of governments to ensure the regulation of information? In the case of the US Government, this is unlikely due to 1st amendment rights of free press. There are heated, ongoing discussions over whether or not companies should be responsible for the potentially harmful events organized through social media content, particularly criminal events, which have historically included gang activity, human trafficking and drug trafficking; however, this falls under the label of protecting the public. (Leetaru, 2018) The US Government has not historically regulated the veracity of information sources of any kind, save for those internal to the government itself, and is not likely to do so any time in the future for social media or news channels.

From these sources, one can order the practical responsibility of involved parties in the case of social media platforms and news networks. Social media companies both have the greatest ability to affect the degree to which users are exposed by misinformation, and appear to be taking action; although that action is slow, likely due to both the technical difficulty of automatically verifying information and due to the necessity of a social media platform to appeal to as wide a demographic as possible by their nature as a for-profit company. Users, while likely have the same or greater ability to change their exposure to misinformation, are unlikely to do so; checking sources is not a common activity, and never has been. While the nature of social

media as a high-noise news platform frequently necessitates this, it is a change that has not occurred. On the other hand, a small fraction of users do give feedback on the platforms they use, and in the case of some platforms this has resulted in somewhat effective change; so, while users appear to be unlikely to take responsibility into their own hands, they appear to be willing to open discussions with the creators and maintainers of the platforms they use. Lastly, governments, at least those which have established freedom of the press, can play no role in regulating the veracity of information, though in the upcoming decade, seeing government regulation of social media for the sake of public safety appears to be more likely.

The question of responsibility is easier for news networks; though the question of change is more difficult. Once again, democratic governments can play no role in this process; it is the responsibility of viewers and the channels they watch to regulate the degree to which misinformation enters the news. Similarly to above, viewers are unlikely to take up the responsibility themselves of separating themselves from sources of information they may agree with, but are false. A viewer will not separate themselves from information they believe to be true; a viewer is unlikely to separate themselves from information they *want* to be true due to confirmation bias. Furthermore, unlike social media networks, there is no clear mechanism for viewers to respond to a channel with concerns, at least not one that is likely to significantly change the channels. News channels are most likely to respond to changes in their bottom line and broad public perception of their content.

The difficulty of changing news networks does have a silver lining, albeit a morbid one; due to the decreasing adoption of news channels as a source of news by younger generations, unless new channels change their content significantly, they are likely to become irrelevant within the next 50 years. In the event that news channels do survive the next half-century, there

is a good chance that it will be because the same feedback that is causing social media platforms to take action with regards to misinformation will cause similar action in news channels. It is unsatisfying, but one possible solution to the problem of misinformation in news channels is a wait-and-see.

This makes social media platforms the more interesting target of analysis. It has been demonstrated that technological fixes, such as changes to the function of the algorithm by the platform operators is capable of causing changes in the rate at which users see misinformation; though how effective this is in actually reducing the rate *at which users are misinformed or uninformed* has yet to be demonstrated, and is a good candidate for a study. It has also been shown that third-party tools such as browser plugins are largely ineffective at dealing with this problem due to low adoption rates. Furthermore, while users may not take action on their own to reduce their degree of misinformation, by limiting exposure to misinformation through feed algorithm changes, there may be an effect of gradual debiasing as individuals are exposed to content from outside their filter bubble, and an increase in open-mindedness as a whole as users are exposed to more relevant, verified information and less noise.

Conclusion

The problem of misinformation in new media is a wicked one; as users and viewers become more entrenched in their views, debiasing can become an impossible task due to individual rejection of alternative perspectives. In the case of social media, there is little responsibility on part of democratic governments both due to freedom of the press, as well as the censorship rights of private organizations. While there is a responsibility on part of users; this responsibility will largely be ignored, as most users are unwilling to put in the extra effort to verify information they read online, or are either unaware of or ignorant of confirmation bias,

and content to see and believe information that reinforces their own views. Luckily, social media platform operators appear to be responding, albeit slowly, to concerns raised by some of their users regarding the spread of misinformation on their platforms. In the case of news channels, this problem is more difficult to solve; but luckily may be self-solving as news channels slowly decrease in popularity with aging generations. With these small changes, it is possible that, as concerns about misinformation and informational apathy rise, populations will become more concerned about the bias and flaws in information they consume, and the real origin of the problem - content creators and reporters that are content with spreading misinformation - will lessen over time.

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