

Social Media, Communities and Networks Conference paper

Online communities, echo chamber and the anti-vaccine movement

David Poiner

Curtin university

[19446240@student.curtin.edu.au](mailto:19446240@student.curtin.edu.au)

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*Keywords*

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*Abstract*

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In the first few months of 2019 a large amount of attention has been drawn to the roles that social media giants like Facebook, Instagram, Pintrest and Youtube are playing in the spread of misinformation. This attention has primarily been focused around the spread of anti-vaccine propaganda as a global resurgence of diseases have been observed by the World Health Organisation. These giants have created this problem through the use of targeted advertising, bolstering confirmation bias, aiding the creation of echo chambers and using their platforms to hijack the neural chemistry of its users. This paper will endeavour to show the real-world negative consequences that come hand-in-hand with giving people freedom of association online.

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*Introduction*

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The technology boom of the 21st century has brought with it the overconsumption of social media platforms, like Facebook, that lead to the creation of online communities. These communities allow communication and instantaneous information sharing. Albeit, factual or not. Platforms like Facebook give users the freedom to connect with likeminded peers and facilitate the forging of strong relationships. Often with complete strangers and based entirely on personal interests, hobbies, ideologies and beliefs. There are, however, potential consequences that come with this freedom. Facebook allows users to create closed communities' and groups which have the potential

to aid in the creation of online echo chambers. An example of an echo chamber that has become harmful to the community is the anti-vaccination movement. Those who subscribe to the beliefs held within this group have utilized online platforms such as Facebook to help them spread misinformation. This unregulated freedom has begun to have effects on the society found outside of the virtual world of ones and zeros.

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### *History and growth of Facebook*

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Facebook was founded in 2004 by Mark Zuckerberg, the current CEO. In 2017, Facebook reported a total of 2 billion members ("Facebook: global penetration by region 2017 | Statistic", 2019). The size of this user-base draws larger mainstream news organizations to the platform. News organizations utilize features such as "Like", "Share" and "Connect" to promote their news stories. Unfortunately, this can also be used to help the spread of misinformation, by other websites/individuals (Bell, 2019). In a study done in 2017, 48% of Americans reported that they rely primarily on Facebook for news and other current affairs (Shearer & Gottfried, 2019).

Facebook has been praised by many as a laneway for the spread of free ideas and information. It does not charge its users to access its platform. Its business model relies on letting external companies advertise to its users through "Targeted advertising" ("Facebook advertising targeting options", 2019). Where traditional media are only able to target broad swaths of the public, Facebook has built an algorithm into the platform that can narrow an advertisement, article or post's target market down to an individual level ("Facebook Algorithms and Personal Data", 2019). It does this by using the information users provide to the company when they interact with the site. With this information they can accurately build a caricature of each person and group them using the dimensions of age, gender, location, interests and even political allegiance. ("Facebook advertising targeting options", 2019) The Facebook algorithm has been purposely created to only show users a feed that will maximize their engagement with the platform and keep them online for the longest periods of time. The more a user engages, responds, likes and dislikes on the platform the more accurately the algorithm can predict things that user would like and push suggestions into their home news-feed. Media scholar, Alfred Hermida, calls this "ambient news" (Hermida, 2019). This means that when it comes to user content and news, the algorithm will only show you things you have interacted with in the past and have had a proven rate of success of keeping you engaged and online. This has created a positive feedback loop for many users where they only see, listen to and read things that they personally agree with, in the psychology community this is referred to as an echo chamber.

An echo chamber is a term used to refer to situations where people “only hear their own voice” (Greitemeyer, 2014). Confirmation bias is a term used to portray the reinforcement of a previously held opinion and the unwillingness to hear opinions that oppose your own (Greitemeyer, 2014). These two phenomena are understood within the medical community and are often referred to as either elective exposure theory or biased assimilation (Greitemeyer, 2014). Elective exposure theory proposes that individuals have the proclivity to seek out and favor information that already confirms what they believe and flatly reject opposing opinion (Greitemeyer, 2014). Biased assimilation on the other hand is when a person voluntarily exposes themselves to opposing opinion but chooses to interpret that information in a way that will bolster their already accepted personal beliefs (Greitemeyer, 2014). These two mechanisms are related to the modern phenomenon of online echo chambers and these echo chambers have been shown to exist within Facebook as well as blogs and forums (Edwards, A. 2013; Gilbert, E., Bergstrom, T., Karahalios, K. 2009; Grömping, M, 2014; Wallsten, K). These echo chambers have far reaching ramifications that has not been considered until recently. If Facebook continues to remain the main source of information distribution to the public, online echo chambers will continue to propagate.

Facebook have increasingly been accused of passively contributing to the existence of echo chambers. A study published in the journal of the National Academy of Sciences collected information on the different topics people engaged with on Facebook between 2010 and 2014. They concluded that most users have a proclivity to congregate and engage in discussions with those who share the same interests, which only serves to reinforce and foster confirmation bias, segregation and polarization (Del Vicario, Bessi & Zollo, 2016). *The authors also found that digital misinformation has become more pervasive in online communities and has led to the World Economic Forum to list it as one of the biggest threats to society* (Del Vicario, Bessi & Zollo, 2016). Facebook and other communities like it are a key link in the chain for these groups to be able to exist. Social media – like the Internet before it – has been hailed as the new “public sphere” and a place for civil discourse among citizens (Hermida, 2019). But this is disingenuous. Facebook is a business first and it has been specifically designed to maximize profit (Solon, 2019). It does this by sheltering people from alternate views and digital information they might not like or agree with to keep them engaged for the maximum amount of time. With targeted advertising, the Facebook algorithm and peoples tendency to seek out only information that

reinforces what they already think Facebook has created an environment where people can shield themselves from opposing opinion. This is not an unfortunate byproduct, but a conscious choice made for the purpose of maximizing user interaction.

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### *Social media and its effect on the brain*

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In 2017, former Facebook president, Sean Parker, gave an interview where he expressed concern over the way in which Facebook keeps its users engaged. Sean stated that during its infant years the only goal Zuckerberg was focused on was “How do we consume as much of your time and conscious attention as possible?” (Solon, 2019). This goal was then achieved using positive reinforcement. When user engagement began to drop, Zuckerberg began to introduce features such as “like”, “share” and “reaction emojis” to produce a dopamine hit for the users. Parker refers to this as a “Social Validation Feedback Loop” (Solon, 2019) and stated that it was the exact thing a hacker like himself would come up with because it exploits the vulnerabilities contained within human neural chemistry (Solon, 2019). Parkers claims are validated with data released by the University of California. Researchers found that the way a person’s brain reacted while scrolling through their Facebook feed was similar to the affects one would expect to see in people with gambling addiction or someone who had recently taken a dose of cocaine (Turel, He, Xue, Xiao & Bechara, 2014). In reference to this study, Dr. Tarah Emrani, a psychologist at NYU Logane Health said that Facebook likes and comments activate the same parts of the brain that opioids effect. Each positive comment or like activates a person’s neurological reward system and releases dopamine, a chemical responsible for pleasure seeking. People experience this chemical typically when they eat food they enjoy, engage in sex or use other substances , including cocaine (Ciaccia, 2019). This pleasure-seeking, social validation feedback loop users experience while interacting with Facebook has led to individuals seeking out those who share common interests and has inadvertently created a system where people will shield themselves from those who disagree (Del Vicario, Bessi & Zollo, 2016). It is arguably the same relationship a drug user may have with a drug dealer; the user will continually seek out and attempt to interact with people who are able to facilitate their addiction and feed them the dopamine they crave. In the world of online communities, this would not be the facilitation of a substance but instead would consist more on the group approval of an idea or shared information. As the public discourse continues to move online the loss of exposure to a plurality of opinions will create a society of extremes with little to no hope for consensus. The effects of these online communities and their confirmation biases have led to the resurgence of near

extinct diseases that threaten the health of those who do not believe in or agree with the misinformation being spread by the subscribers.

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### *The global resurgence of disease*

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The CDC (Centre for Disease Control) released a report in October 2018 stating that the number of children who aren't being given their recommended immunizations by 24 months old has been gradually increasing (Hill, Elam-Evans, Yankey & Singleton, 2018). "Vaccine hesitancy," which WHO (World Health Organization) described as the reluctance or refusal to vaccinate despite their availability ("Ten health issues WHO will tackle this year", 2019) is now classified as a top global threat for 2019. The WHO has also shown that measles has seen a 30 percent increase in cases globally ("Ten health issues WHO will tackle this year", 2019). This resurgence of diseases can be directly linked to Facebook, which has allowed closed communities to easily disseminate and spread vaccine misinformation.

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### *Social medias role in this resurgence*

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Dr. Peter Hotez, a faculty member of the Baylor College of Medicine, recently investigated the spread of anti-vaccine information on Facebook. The study was inspired by a video that was uploaded to Facebook by Kids Plus Pediatrics, a pediatric care practice in Pittsburgh. In the video Kids Plus Pediatrics explains that it offers the human Papillomavirus vaccine, the video was then attacked by anti-vaccine advocates in the comment section. Dr Hotez, upon seeing this, designed the study to include the analysis of 198 million Facebook accounts, including some of the users who commented on the original video by Kids Plus Pediatrics. Of the 198 million accounts chosen, 89 percent, identified as women and represented 36 states within the US and eight different countries (Lionetti, 2018). At the conclusion of the research, Dr Hotez found that individuals who share the same negative opinion of vaccines were connecting globally via Facebook and recommended that clinicians and researchers should develop interventions to combat the propagation of misinformation about vaccines on social media. (Lionetti, 2018). Furthermore, the study found that Facebook as a company had become a key disseminator of vaccine misinformation, and hosts online communities for up to 500 misinformation websites, (Hoffman et al., 2019; Moran, Lucas, Everhart, Morgan & Prickett, 2016). The ability for the misinformed to group together and spread their views has come as no shock to many pro-vaccine advocates who have been calling attention to Facebook's complicity in these echo chambers.

The American Academy of Pediatrics (AAP) have been a vocal advocate against Facebook. They believe that Facebook is not doing enough to prevent the spread of misinformation within its platform. Dr Wendy Sue Swanson, spokeswoman for the AAP, said: “Facebook should prioritize dealing with the threat to human health when falsehoods and misinformation are shared. This isn’t just self-harm, it’s community harm.” (Pilkington & Glenza, 2019) Community harm is the distinction that needs to be drawn. While many argue that the ability to discuss these topics online and find other like-minded individuals is a freedom that should be offered to everyone. It can be argued that any intervention or censorship is an overstep of corporate power. However, Facebook has recently been forced to agree with many who share concerns about the effects these freedoms are having on community health. In March 2019, Facebook announced that it would begin to undertake a few steps to help prevent the spread of misinformation, specifically about vaccines. Facebook stated they would achieve this by reducing the ranking of Facebook groups and Pages that spread misinformation about vaccinations in news feed and search results (Graham, 2019). When confronted with ads that contain misinformation about vaccines it will reject the advertisement application, and may take further action to ensure that the account that applied for the advertising is disabled (Graham, 2019). This crackdown has been a vital and necessary step towards controlling the effect people’s online personas are having on the community they live in. Many other online communities have been forced to examine the ways in which they are contributing, complicit or otherwise, to the spread of misinformation.

Other social media giants have quickly begun to follow in Facebook’s footsteps and begun taking necessary steps to crack down on the spread of misinformation regarding vaccines (Cuthbertson, 2019). In March 2019 Instagram, a platform where people share and communicate predominantly with images, announced it had undertaken the task of banning hashtags that promote anti-vaccine sentiment (“Instagram to block anti-vaccine hashtags amid misinformation crackdown”, 2019). It has also put restrictions on accounts that are known spreaders of misinformation (“Instagram takes action against rugby league WAGS”, 2019). It has also been shown that Twitter, an online community that gives people the ability to communicate quickly with the world using statements under 240 characters, is a hotbed for anti-vaccine sentiment (Cuthbertson, 2019). Pinterest, another platform which allows users to create virtual scrapbooks, declared that anyone using the platform to spread information found detrimental to public health would be removed (Abellan, 2019). Youtube, an online community revolving around the creation and sharing of videos, also publicized that it would be removing ads from anti-vaccine videos effective immediately (Abellan, 2019). Some anti-vaccine advocates have stated that these policies are a violation of their rights of freedom of expression and has brought about

fear of online censorship. This argument is not only short sighted, but also an incredibly self-absorbed lens to perceive the world through.

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### *Online freedom of association*

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Everyone should be afforded the ability to freely express themselves on these online communities. However, at what point do we crack down on people's tendency to engage in confirmation bias. In 1939, a prominent lawyer by the name of Arthur Garfield Hays published a book titled "Democracy works". Within this book he stated that, "In a society where interests conflict, I realize there can be no absolutes. My freedom to swing my arm ends where the other fellow's nose begins." (Hays & Pforzheimer, 1939). This saying is not only relatable in people's everyday existence but should also be applied to their virtual lives. An individual's right to communicate freely online, seek out like-minded online communities and express themselves should not be trampled. When people's online communities routinely engage in confirmation bias and begin to negatively impact the health of the social environments, they live in outside the computer screen a discussion should be had on the censorship of these communities and the harmful ideas they spread.

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### *Conclusion*

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Facebook and other online communities are mainly focused on maximizing user interactions and drawing the conscious attention of its users by exploiting their neural chemistry. The existence of social validation feedback loops has complicity encouraged users to seek out and engage only with those who agree, giving rise to the existence of online communities which function as confirmation bias-based echo chambers. Facebook has been linked as one of the key publishers and disseminators of anti-vaccine misinformation which has led to a resurgence of near extinct diseases such as measles. Other tech giants have also begun to look at the complicit roles they are playing in the spreading of harmful ideas. A discussion on the negative effects of online communities must be had if we are to fully understand the potential consequences of allowing like-minded individuals to congregate and share with each other without opposition.

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