THE PERSONALIZATION PUZZLE

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INTRODUCTION

In 2012, 75% of households in the United States had internet access. Countless other individuals have access to the internet at school, work, on smartphones, and in coffee shops.[1] Wi-Fi is now available on airplanes and buses.[2] The internet has become a pervasive part of society and the American populace is constantly connected. Google has become a household name; 'googling' was officially added to the dictionary in 2006.[3] Six out of ten Americans get their news from social media.[4] People can access Google and Facebook from almost anywhere with just the click of a button, making them the "go to" sources of news and information. Unfortunately, most people do not understand how that information is generated.

Complex algorithms determine users' search results and the content of their social media accounts.[5] These algorithms often use machine learning and artificial intelligence, making it impossible to predict their output.[6] Increasingly, these algorithms have been employed to personalize users' online experiences.[7] Google and Facebook use these algorithms to analyze users' likes, clicks, search history, location, and other information to determine which articles, websites, and posts to include in search results and

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[1] United States Census Bureau, Table 4: Households with a Computer and Internet Use: 1984 to 2012 (2014).

[2] *See* SOUTHWEST AIRLINES, Southwest.com, *see also* MEGABUS, megabus.com

[3] Barry Schwartz, *Google Now a Verb in the Oxford English Dictionary,* Search Engine Watch (June 29, 2006), https://searchenginewatch.com/sew/news/2058373/google-now-a-verb-in-the-oxford-english-dictionary.

[4] Jeffrey Gottfried & Elisa Shearer, *New Users Across Social Media Platforms 2016*, Pew Research Center 2 (2016).

[5] How Search Works, www.google.com/insidesearch/howsearchworks /thestory (last visited November 17, 2016).

[6] Jack Clark, *Google Turning Its Lucrative Web Search Over to AI Machines* BLOOMBERG LAW, https://www.bloomberg.com/news/articles/2015-10-26/google-turning-its-lucrative-web-search-over-to-ai-machines (last accessed November 15, 2016).

[7] Bryan Horling, *Personalized Search for Everyone*, GOOGLE
https://googleblog.blogspot.com/2009/12/ personalized-search-for-everyone.html (last visited November 1, 2016); *see also Who Controls Your Facebook Feed*, SLATE, www.slate.com/articles/technology/cover_story/2016/01/how_facebook_s_news_feed_algorithm_works.html (last visited November 3, 2016).

newsfeeds.[8]   Often users are completely unaware of the algorithms operating beneath the surface, controlling the information they receive. This lack of transparency makes it difficult for users to access the unbiased information necessary to make decisions, which is a key requirement for effective self-government.[9] As web personalization becomes more prominent, it will challenge one of the fundamental basis of our democratic society; the access to unbiased information.   By creating online echo chambers[10] that present users with information that confirm their beliefs, theories, and biases, personalization stifles open discussion and debate.

We need to balance Google's and Facebook's rights to free speech with access to diverse and contradictory information.   In stark contrast to the dystopias imagined by Orwell and Huxley, it is not the government that threatens our individual rights via control, surveillance, and censorship, [11] but private corporations, which are not bound by the First Amendment. Although the First Amendment does not prevent corporations from stifling speech, the rights and values promoted by the First Amendment should be the starting point of our analysis.   Online personalization threatens our freedom of expression, which is critical to democratic debate and innovation.   As such, the values underlying the First Amendment should shape our approach to personalization.

I. THE INTERNET, THE NEWS, AND THE SHIFT TO PERSONALIZATION

With every advance in media, the law has grappled with how to address changing technology and usage. Historical approaches illustrate how law and technology shape one another and provide insight into how the law balances competing interests.   Examining media history highlights the constant struggle to address problems presented by new media.

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[8] *Id.*

[9] ALEXANDER MEIKLEJOHN, FREE SPEECH AND ITS RELATION TO SELF-GOVERNMENT, 25 (1948).

[10] An echo chamber is a specific form of group polarization "characterized by selective exposure, ideological segregation, and political polarization." Barbera, et al, *Tweeting from Left to Right: Is Online Communication more than an Echo Chamber?*, 26 PSYCHOL. SCI. 1531, 1532 (2015).   "[G]roup polarization arises when members of a deliberating group move toward a more extreme point in whatever direction is indicated by the members' predeliberation tendency." Cass R. Sunstein, *The Law of Group Polarization,* 10 J. POL. PHIL. 175, 177 (2002).

[11] *See* GEORGE ORWELL, 1984 (1949), ALDOUS HUXLEY, A BRAVE NEW WORLD (1932).

A. *History of the News Media From Print Until Cable.*

In early history, news was spread by word of mouth. Individual access to information was dictated by friends and acquaintances and therefore limited by geography and social class. Then, in 1440 Gutenberg invented the printing press. Newsprint appeared and made information more accessible to the masses. The first newspaper was published in the American Colonies in 1690,[12] opening the door for a medium that served as a catalyst for revolution and eventually a platform to promote ratification of the Constitution.[13]

Despite the American democracy's early reliance on news print, the industry did not take off until the 1830s.[14] Advances in printing helped lower costs and newspapers were able to reach a wider audience.[15] It was during this time, the newspaper, as we know it today, began to develop. Then in 1865, advertising revenue surpassed subscription fees as the primary source of income[16], shifting the dynamics of the newspaper industry. During the 1890s, massive consolidations in the news industry driven by large corporate newspapers acquiring independent papers, lead to a new focus on the "bottom line."[17] In order to increase circulation and capitalize on the new business aspects of the industry, sensational stories known as "yellow journalism" became the norm.[18] No longer was journalism about providing information - profit was now the driving force. In response to the increase in "yellow journalism" and the introduction of photography, Warren and Brandeis penned their now famous article "The Right to Privacy."[19] Warren and Brandeis were frustrated with media's focus on members of high society and thus argue individuals have a fundamental right to privacy that is protected by law. The article became the foundation of the privacy torts, illustrating how law, media, and technology interact and shape one another. Shortly after Warren and Brandeis published their article, Adolph Ochs bought the New York Times

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[12] Bill Moyer, Politics and Economy: Milestones in the History of Media and Politics, PBS, http://www.pbs.org/now/politics/mediahistory.html (last visited Nov. 2, 2016).

[13] Eric Slaughter, *Reading and Radicalization: Print, Politics, and the American Revolution,* 8 EARLY AM. STUD. 5, 9 (2010).

[14] Bill Moyer, *supra* note 12.

[15] Bill Moyer, *supra* note 12.

[16] Bill Moyer, *supra* note 12.

[17] Bill Moyer, *supra* note 12.

[18] Bill Moyer, *supra* note 12.

[19] Samuel Warren and Louis Brandeis, *The Right to Privacy,* 4 HARV. L. REV. 193 (1890).

and introduced the concept of journalistic integrity.[20] Ochs promised "to give the news impartially, without fear or favor."[21] By the 1920s, the news media peaked, with household penetration reaching 130% or more than one subscription per household.[22] Newspapers became the primary source of information across the country.

After the 1920s, popularity of the newspaper began to decline. The decline was due in part to the advent of radio, which became a household staple during the 1920s and 30s. Then, the passage of the Communications Act of 1934 laid the foundation for commercial television.[23] Unlike newspaper and radio, commercial television required government licensure because the means of broadcast, airwaves, were owned by the federal government. Because of this, the government exercised more control over broadcast than other forms of media, including regulations requiring broadcast companies to show diverse political perspectives on air.[24] By 1963, polls indicated that the majority of American's relied on television for their news more than any other source[25] and broadcasters like Walter Cronkite became household names. These broadcasters reigned supreme until the advent of cable in the 1970s[26] led to the proliferation of cable news networks, beginning with CNN in 1980.[27] Then in the mid-1990's the World Wide Web became commercially available, and a new media outlet took shape.

B. The Advent of a New Medium

In 1969, the Defense Advanced Research Projects Agency performed a demonstration of ARPANet.[28] That network, designed to link scientists across the country, was the first in a string of networks that would eventually lead to the internet. Despite its modest beginnings, the internet has become

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[20] Bill Moyer, *supra* note 12.

[21] Bill Moyer, *supra* note 12.

[22] Andre Amaral Lucena, *The Print Newspaper in the Information Age*, 12 PROCESS OF THE MEDIA ECOLOGY ASSN. 53, 54 (2011) (discussing household penetration, "average daily circulation measured as a percent of households").

[23] Bill Moyer, *supra* note 12.

[24] Andrew A. Bernstein, *Access to Cable, Natural Monopoly, and the First Amendment,* 86 COLUM. L. REV. 1663, 1664 (1986).

[25] Bill Moyer, *supra* note 12.

[26] *Cable's Ongoing Evolution*, Nat'l Cable & Telecomm. Ass'n, https://www.ncta.com/who-we-are/our-story (last visited Nov. 1, 2016).

[27] *June 1:This Day in History,* History.com, last visited (September 26, 2017), http://www.history.com/this-day-in-history/cnn-launches.

[28] *ARPANet and the Origins of the Internet*, Def. Advanced Research Projects Agency, http://www.darpa.mil/about-us/timeline/arpanet (last visited Nov. 2, 2016).

a central feature of modern society. Combined with the invention of the World Wide Web in 1989, the internet became indelible to business and communications.[29] On any given day, billions of people from across the world access the internet. In fact, more than 2.3 million Google searches are processed each minute.[30]

Given the breadth of internet usage, it is not surprising that the internet is disrupting traditional media. "Many internet enthusiasts have heralded it as a democratizing force that will give voice to diverse social, economic, and cultural groups, to members of society not frequently heard in the public sphere."[31] Websites dedicated to connecting users from across the world popped up and gave a forum for anyone to debate and discuss ideas. It was in this environment that many of the regulations and laws addressing internet usage were first passed. Among these laws was the Communications Decency Act (CDA), which was passed in 1996 to regulate pornography on the internet.[32] Although most of the Communications Decency Act was struck down as a violation of the First Amendment,[33] CDA §230, which shields interactive computer service providers from liability as speakers or publishers of user generated content, is still in effect today [34] and is used to regulate a vastly different online universe, providing broad First Amendment protections for interactive computer services.

In the same year Congress passed the CDA, two graduate students at Stanford founded Google.[35] "Google [was] designed to crawl and index the Web efficiently and produce much more satisfying search results than existing systems."[36] Using an algorithm called PageRank, Google searched and indexed the web to create a set of results based on a network analysis of links between websites.[37] The results are organized by their PageRank,

[29] *The Birth of the Web*, CERN, https://home.cern/topics/birth-web (last visited Nov. 1, 2016).

[30] Jillian D'Onfro, *Here Is a Reminder How Huge Google Search Truly Is*, Business Insider (Mar. 27, 2016, 10:41 AM), http://www.businessinsider.com/google-search-engine-facts-2016-3/#first-a-trip-down-memory-lane-heres-what-googles-search-page-looked-like-back-in-1997-1.

[31] Lucas D. Introno & Helen Nissenbaum, *Shaping the Web: Why the Politics of Search Engines Matter*, 16 THE INFO. SOC'Y 169, 169 (2000).

[32] Paul Ehrlich, *Communications Decency Act §230,* 17 BERKLEY TECH. L.J. 401, 401 (2002).

[33] *Id.*

[34] Communications Decency Act of 1996, 47 U.S.C.A. § 230 (West 1998)

[35] Google Company, *Our History in Depth,* (last visited February 7, 2017), https://www.google.com/about/company/history/.

[36] Sergey Brin & Lawrence Page, *Reprint of: The Anatomy of a Large-Scale Hypertextual Web Search Engine,* 56 Comp. Networks 3825, 3825 (2012).

[37] *Id.* at 3826.

which is a proxy for the website's relevancy and quality.[38] PageRank dramatic improved the quality of internet search. But this was just the beginning of Google's dominance. In 2005, Google introduced personalized search as part of Google Labs, which allowed users to test the new feature.[39] For the first time, an individual would be able to receive custom search results from Google.[40]

C. The Rise of Personalization

In 2009, Google first announced that it would be providing personalized search for everyone.[41] Unlike most major events in Silicon Valley, this was not broadcast to the media or announced at a widely covered press conference. Instead, it was announced through a short post on Google's official blog.[42] Personalization was not a new feature, but for the first time, all searches would be personalized by default.[43] Individuals no longer had to opt-in to personalized search.[44]

Personalization is not exclusive to Google. Facebook personalizes users' Newsfeeds,[45] personalized ads fill browser space, and Amazon personalizes users' recommendations.[46] In fact, personalization can be found across the web and is quickly becoming the norm.[47] Netflix and Amazon make their money off of providing custom recommendations and Google, Facebook, and Twitter survive off of advertising revenue.[48] The more personalized an ad, the more likely a user is to purchase the product, making the ad more valuable. In other words, the more these companies know about their users, the more profitable they are, making personalization indispensable. With personalization standard across the internet, it is important to scrutinize its impact on our world.

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[38] *Id.*

[39] Steve Kamvar, *Search Gets Personal*, Google Blog,
 https://googleblog.blogspot.com/2005/06/search-gets-personal.html.

[40] *Id.*

[41] ELI PARISER, THE FILTER BUBBLE: HOW THE NEW PERSONALIZED WEB IS CHANGING WHAT WE READ AND HOW WE THINK 1 (2011).

[42] PARISER, *supra* note 41.

[43] Horling, *supra* note 7.

[44] *Id.*

[45] Facebook's newsfeed is the constantly changing list of stories on their homepage. Facebook, Inc., *How News Feed Works,* Facebook Help, https://www.facebook.com/help/327131014036297/.

[46] PARISER, *supra* note 41, at 7-8.

[47] PARISER, *supra* note 41, at 7-8.

[48] PARISER, *supra* note 41, at 7-8.

II. PROBLEMS WITH PERSONALIZATION

Most internet users today do not realize the extent to which their internet experience is personalized. Consider a recent New York Times article discussing an interview with several supporters of President Trump about his comments indicating that he may not accept the 2016 election results. Backing President Trump's threats, one supporter pointed to social media, saying, "If you get on social media, he's got Hillary beat 3 to 1."[49] Despite his confidence, President Trump lost the popular vote by 2.8 million votes.[50] Although he correctly predicted the outcome of the election, he did not accurately predict Hillary Clinton's popularity. The voter probably did not consider the biases inherent in group selection, nor did he consider the biases associated with algorithmic personalization.

Facebook is a 'like' culture.[51] The articles, posts, and advertisements users see are based on their likes and clicks.[52] People are inherently bad at recognizing personal biases and Facebook and other social media sites compound these biases by providing users with personalized content without notifying them that it caters to their interest, opinions, and preferences.[53] Such personalization leads to online echo chambers that isolate users from contrary or dissenting opinions and information, stifling public debate.[54] Similarly, Google scours Gmail, Google Drive, IP addresses, and search history to provide users with relevant and useful search results.[55] As users browse the internet and click on search results,

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[49] Ashley Parker & Nick Corasaniti, *Some Donald Trump Supporters Warn of Revolution if Hillary Clinton Wins,* N.Y. TIMES, Oct. 28, 2016, at A1.

[50] 2016 Election Results, CNN.COM http://www.cnn.com/election/results/president (last visited Nov. 19, 2016).

[51] PARISER, *supra* note 41, at 149-151 ("That Facebook choose Like instead of, say, Important is a small design decision with far-reaching consequences: The stories that get the most attention on Facebook are the stories that get the most Likes, and the stories that get the most Likes are, well, more likable.").

[52] *Id.*

[53] PARISER, *supra* note 41.

[54] *See* NPR Staff, *The Reason Your Feed Became an Echo Chamber- And What to do About It,* NPR.ORG, http://www.npr.org/sections/alltechconsidered/2016/07/24/486941582/the-reason-your-feed-became-an-echo-chamber-and-what-to-do-about-it (last visited November 19, 2016), ("But algorithms, like the kind used by Facebook, instead often steer us toward articles that reflect our own ideological preferences, and search results usually echo what we already know and like.") and Walter Quattrociocchi, Antonin Scala, & Cass R. Sunstein, *Preliminary Draft - Echo Chambers on Facebook,* June 13, 2016 ("[P]olarization creates largely closed, mostly non-interacting communities centered on different narratives - i.e. echo chambers.").

[55] Horling, *supra* note 7.

the algorithms create more detailed pictures of the users.[56] With each new search the results become more tailored, filtering out content that does not align with the algorithm's understanding of the user. For example, a member of the NRA may get drastically different search results from a member of the ACLU when searching for "Second Amendment Rights."

Given the lack of transparency, personalization presents three notable roadblocks to the freedom of expression. The first arises from the motives underlying personalization: money and user commodification. The second arises from personalization's propensity for creating online echo chambers. The last arises from, personalization's coopting of users' choices through algorithmic censorship, which gives algorithms rather than users the ability to choose the information they can access.[57]

A. The Economics of Personalization

Many of the big names on the internet, including Google, Facebook, and Twitter are all free services that make money by commodifying their users. These companies are constantly clamoring for more users, not because user subscriptions generate profit, but because users and their data are the companies' products.[58] Much like the shift from subscription- to advertising-based income that led to the rise of "yellow journalism" in the 1890's, the increased prominence of advertising on the internet has created a new phenomenon. To be an attractive target for advertising space, a website must have a lot of users, ideally users who are interested in the product being advertised. Websites that can connect advertisers with users who find their products relevant sell more ads. Before personalization, relevance was determined by analyzing the site itself and ascertaining the type of users that visit. But this method of advertising is inherently inefficient since users rarely fit into a neat categorization.[59] Now personalization allows websites to determine products that are relevant to an individual user and provide customized ads. Rather than targeting a particular type of person, advertisers target specific people. [60]

For this personalized advertising to work, advertisers must understand

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[56] *Id.*

[57] *See* Part II.C, *infra.*

[58] PARISER, *supra* note 41, at 49-50.

[59] Sergey Brin & Lawrence Page, *Reprint of: The Anatomy of a Large-Scale Hypertextual Web Search Engine,* 56 Comp. Networks 3825, 3825 (2012).

[60] PARISER, *supra* note 41, at 48-50.

each individual user, which requires vast amounts of data.[61] Luckily, thanks to technology, internet companies have massive repositories of user data.[62] Google and Facebook track users' likes, clicks, and even the time they spent on a site before clicking a link.[63] Initially, Google used the information solely to help improve search results. For instance, if someone clicked the second or third website listed in the search, it was clearly more relevant than the first website.[64] If Google could capture and incorporate that information into their search algorithm, the results would improve.[65] But in order to incorporate that information into an algorithm, Google needed to retain it. As more and more users searched the web, Google amassed data about their preferences. The data repositories created soon proved to be an effective money-making venture. Although this does not present a problem in and of itself; it does change the incentives for creating and improving search algorithms.

While targeted ads seem like little more than a nuisance, they create monetary incentives that shift companies' focuses from their users to their advertisers. When the internet first emerged, many argued that because of its unique nature, which gave more individual voices an opportunity to be heard, the internet should be allowed to evolve without government regulation.[66] Unfortunately, during the early years, few people recognized that the true monetary value of the internet was in the data it generated. In the beginning, search engines and other free online services attracted paid advertisers based on the website's traffic.[67] Therefore, to succeed search engines had to cater to the searcher's desires.[68] As a consequence, search providers valued user satisfaction more than providing accurate and unbiased results. This led to an increased drive for user data, which allowed search engines to provide more relevant and personalized results. As data

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[61] PARISER, *supra* note 41, at 48-50.

[62] PARISER, *supra* note 41.

[63] PARISER, *supra* note 41, at 34.

[64] PARISER, *supra* note 41, at 32-33.

[65] PARISER, *supra* note 41, at 32 ("If someone searches for "Larry Page," say, and clicks on the second link, that's another kind of vote: It suggests that the second link is more relevant to that searcher than the first one.").

[66] Laura Granka, *The Politics of Search – A Decade Retrospective,* 26 Information Society 364, 364 (2010).

[67] *See* Lucas D. Introna & Helen Nissenbaum, *Shaping the Web-Why the Politics of Search Matters*, 16 INFORMATION SOCIETY 169, 176 (2000).

[68] *Id.* ("Similarly, search engines attract paid advertisements based on the promise of search usage. High usage, presumably, garners advertisers and high charges. To succeed, therefore, search engines must establish a reputation for satisfying seekers' desires and needs; this way they will attract seekers in the first place, and then will keep them coming back.")

mining and algorithmic capacity increased, the data collected for these algorithms became more valuable. Soon, search engines shifted their focus from user needs to find the best way to capitalize on user generated data. In essence, the data mined for use in personalization algorithms became a commodity.

However because people frequently use search engines to discover information that they do not know, they cannot gauge the accuracy or comprehensiveness of the results.[69] Additionally, the history of search algorithms mistakenly gives users the idea that search results are based on an unbiased, scientific process that produces consistent results.[70] The fabled Google PageRank formula, which sorted search results based on a ranking created by analyzing the number and types of websites that link to a particular website, laid the foundation for our society's understanding of search results.[71] To this day, this belief dominates the nation's perception and understanding of internet searches, a phenomenon aided by the lack of transparency surrounding personalized search.[72] And with today's use of machine learning and artificial intelligence, users' biases are incorporated into the results, giving individual users different results for the same query. Couple this with the lack of transparency surrounding the motives underlying web searches, and users are left with difficulty in determining the quality of search results. This in turn distorts the market by giving internet companies free reign to manipulate users' online experiences and profit off of the data they generate with little or no regulatory or market-driven oversight.[73]

Finally, if the main source of revenue for search engines and social media sites is advertising, the number of users actively using the site is critical. Therefore, search providers and social media platforms must capture and retain an ever-increasing number of users. This again incentivizes providers to cater to users' interests and preferences rather than credibility.[74] Taken together, the driving force for personalization is money, not users.

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[69] Lucas D. Introna & Helen Nissenbaum, Shaping the Web-Why the Politics of Search *Matters*, 16 INFORMATION SOCIETY 169, 176- 177 (2000).

[70] *See* Poll: Are Google Searches Biased, (last visited September 26, 2017). http://www.dailywire.com/news/19572/poll-are-google-searches-biased-james-barrett#.

[71] Brin & Page, *supra* note 59*, at 30, *see also* Amy N. Langville & Carl D. Meyer, *Google's PageRank and Beyond: The Science of Search Engine Rankings* (2006).

[72] *See* Horling, *supra* note 7. *See also* Google's Privacy Policy, https://www.google.com/intl/en/policies/privacy/#infocollect.

[73] *Id.*

[74] *Id.* at 177.

B. The "You-niverse" Is At Your Fingertips

According to Sheryl Sandberg, Facebook's Chief Operating Officer, "[p]eople don't want something targeted to the whole world – they want something that reflects what they want to see and know."[75] To present users with information that reflects "what they want to see and know," internet companies use advanced algorithms to predict which information is most relevant to each user. [76] When a user searches in Google, an algorithm is working in the background to predict which results the user will find most relevant.[77] But, "relevance is data-driven and search engines aim to maximize the user's probability of clicking on and dwelling on the results shown."[78] "Search engines don't aim to provide the most objectively correct or useful information," they aim to provide information that is relevant to the individual.[79]

Relevance is often defined as information that "reflects what [users] want." Therefore, personalization is critical to the search for relevance,[80] leading internet companies to create advanced algorithms to personalize each user's internet experience.[81] These algorithms determine the information users seen in newsfeeds and search results.[82] Machine learning helps the algorithms incorporate search terms, likes, and clicks into a detailed picture of a user's internet self, providing them with the exact search results or newsfeed it predicts they want to see.[83] Although these algorithms create a personalized experience that makes searching, shopping, and reading the news more efficient, it comes at a cost.[84] The personalization of the internet experience filters out potentially relevant information because it does not conform to the user's interests or ideology

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[75] PARISER, s*upra* note 41, at 110.

[76] Horling, *supra* note 7.

[77] *Id.*

[78] Hema Yoganarasimhan, *Search Personalization Using Machine Learning*, https://pdfs.semanticscholar.org/bbd5/4707de2e4574083417d85ca37c5a10faad42.pdf. .

[79] *Id.*

[80] Horling, *supra* note 7.

[81] *See* Horling, *supra* note 7; Will Oremus, Who Controls Your Facebook Feed, SLATE, Jan. 3, 2016,
www.slate.com/articles/technology/cover_story/2016/01/how_facebook_s_news_feed_algorithm_works.html.

[82] *See* Horling, *supra* note 7.

[83] Hema Yoganarasimhan, *Search Personalization Using Machine Learning,* https://pdfs.semanticscholar.org/bbd5/4707de2e4574083417d85ca37c5a10faad42.pdf. .

[84] PARISER, *supra* note 41, at 109-113.

– information that does not "reflect what they want to see."[85] In essence, the personalization of our internet experience leads to an echo chamber, verifying users' biases and preferences.

By incorporating user inputs, these echo chambers become tailored to user biases and beliefs. Moreover, the self-referential nature of the algorithms narrows user access.[86] The algorithm first incorporates user behaviors, such as clicks and likes, into input variables, generating more precise results and provide additional data to incorporate into the algorithm.[87] Thus user's interaction with the website informs the algorithm, which in turn determines the content seen in newsfeeds and search results.[88] But, more important, the content presented to users shapes their identities.[89] As users interact with personalized websites and the algorithms create more myopic, one-dimensional views of the users and the algorithm's predictions become more narrow and precise, limiting the content users can access.

If users are presented only with a narrow array of choices, they can only provide the algorithm with a narrow set of data. A user cannot select a link that is not presented in their search results and a Facebook user is unlikely to like a picture that does not show up on their newsfeed. Thus, these algorithms tend to produce what are known in other fields as local optima.[90] User data fed into the algorithm is limited by the information the algorithm presents to the user, making it difficult for the algorithm to create a nuanced model of the user which limits the scope of the algorithm's predictions.[91] In essence, the algorithms present users, with results that are ideal for its model version of the user. But this model version is local to Google or Facebook and not a true representation of the user.[92] Therefore,

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[85] PARISER, *supra* note 41, at 109-113.

[86] PARISER, *supra* note 41, at 109-113.

[87] PARISER, *supra* note 41, at 112. ("Most personalization filters are based on three steps. First, you fig,ure out who people are and what they like. Then, you provide them with content and services that best fit them. Finally, you tune to get the fit just right.")

[88] PARISER, *supra* note 41, at 112.

[89] PARISER, *supra* note 41, at 112 ("Your identity shapes your media. There's just one flaw in this logic: Media also shape[s] identity. And as a result, these services may end up creating a good fit between you and your media by changing…you.").

[90] *Local v. Global Optima,* (last visited Nov. 20, 2016), https://www.mathworks.com/help/optim/ug/local-vs-global-optima.html?requestedDomain=www.mathworks.com. A local minimum of a function is a point where the function value is smaller than the value at neighboring points, but not necessarily the smallest value in the solution set. Similarly, a local maximum of a function is a point where the value of the function is larger than the value at neighboring points, but not necessarily the maximum value. When algorithms use feedback looks they often get stuck in local optima and thus do not produce the best results available. There are techniques for avoiding stagnation at local optimums.

[91] PARISER, *supra* note 41, at 117.

[92] PARISER, *supra* note 41, at 117.

the results presented do not necessarily "reflect what [the user] want[s] to see," but rather what the one-dimensional mathematical version of the user wants to see.[93] So, as the only results presented, these are the only results users can interact with and feedback into the algorithm.[94] This further limits and biases future results.

By presenting users with information that confirms their beliefs, this self-referential characteristic exacerbates the users' own confirmation bias.[95] Additionally, because algorithms present results that mirror users' beliefs and ideologies, user data the algorithms collect is tainted by implicit biases.[96] Thus, the users' own inherent biases infect the algorithm and are perpetuated in future iterations. Such perpetuation creates online echo chambers, where users' beliefs are reflected back at them in their newsfeeds and search results. For example, a user who frequently select articles denying global warming will continue to be presented with information that confirms that global warming is a hoax. Similarly, if a user frequently like articles posted by a like-minded friend on Facebook, the user will see more articles posted by that friend in their newsfeed.[97]

Constantly inundating people with information that confirms their beliefs makes it difficult for them to accept alternative beliefs.[98] If a person is never presented with contradictory information, they quickly come to believe whatever information is presented to them. Take the recent presidential election for example. "Fake" news about the two leading presidential candidates flooded Google and Facebook. These stories used Google's and Facebook's online advertising program to get space on users' walls and in users' searches. These stories were shared among like-minded friends and confirmed by other people sharing them on social media. Although most of the stories were eventually outed, users who shared or viewed the original story either did not see or ignored the rebuttals.[99] Since coverage is determined by users' past behavior and the people with whom

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[93] PARISER, *supra* note 41, at 110.

[94] PARISER, *supra* note 41, at 112.

[95] *Confirmation Bias*, SCIENCE DAILY, https://www.sciencedaily.com/terms/confirmation_bias.html (last visited Nov. 20, 2016).

[96] PARISER, *supra* note 41, at 88.

[97] PARISER, *supra* note 41, at 88.

[98] Ann Ford, *The Surprising Speed with which we become Polarized Online,* KELLOG INSIGHT, (last visited Sep. 26, 2017), https://insight.kellogg.northwestern.edu/article/the-surprising-speed-with-which-we-become-polarized-online.

[99] Nick Wingfield, Mike Isaac, & Katie Benner, *Google and Facebook Take Aim at Fake News Sites,* N.Y. TIMES, http://www.nytimes.com/2016/11/15/technology/google-will-ban-websites-that-host-fake-news-from-using-its-ad-service.html

they interact on social media, information contradicting fake news articles was not reaching the same audience as the news articles themselves.[100] Misinformation could not be corrected because the message was being filtered out by personalization algorithms trying to "reflect what [the user] wants to see."[101]

C. Algorithmic Censorship and the Demise of Choice

The internet is one of our society's most prolific sources of information. Many children today do not know what an encyclopedia looks like, but they are aware of Wikipedia. The internet has changed how society receives and processes information. Much like the advent of television, the Internet has changed how we access and share information with friends and colleagues.[102] Because of its reach, the Internet, and by proxy the companies that control it, determine how information is presented to the world. These companies shape what information is available to users and in what form.

By shaping how the world receives and interacts with information, personalization controls the conversation. Personalization "shapes the content and opportunities we see and don't see"[103] and who we interact with. By controlling who and what users interact with online, personalization algorithms limit the users' ability to actively choose what information and sources they want to read.

Unlike traditional media where readers see all the articles available or are at least forced to scan the headlines, the internet filters out information that it deems irrelevant, replacing users' conscious self-filtering with algorithmic filtering. Unfortunately, algorithmic censorship does not provide users with a conscious choice in the information they can access. Rather an algorithm determines what it predicts a reader will find relevant. By removing the need to self-filter, the internet makes acquiring information less active and limits an individual's choice in the articles they decide to read. Additionally, self-filtering forces people to decide which articles are critical to them, forcing them to make qualitative judgment calls about the policies and issues they care about. When people search topics online, those qualitative judgements are no longer required because search algorithms determine what a person will find relevant and important. By

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[100] PARISER, *supra* note 41, at 89.
[101] PARISER, *supra* note 41, at 110.
[102] Lucas D. Introna & Helen Nissenbaum, *Shaping the Web: Why the Politics of Search Engines Matter*, 16 The Information Society 169, 169 (2000).
[103] PARISER, *supra* note 41, at 241.

taking away these choices, personalization creates passive users who are discouraged from actively engaging with information presented to them.

III. PERSONALIZATION AND THE FIRST AMENDMENT

As illustrated above, advances in media and technology have increased corporate interference with people's freedom of expression. By creating online echo chambers, web personalization disincentivizes corporate focus on user needs and limits a person's ability to determine the information they want to access. Web personalization challenges the fundamental values of the First Amendment: democratic debate, informed citizens, and the search for truth.

A. Freedom of Speech and Web Personalization

John Stuart Mill championed the search for truth as the foundation of the freedom of speech articulated in the First Amendment.[104] According to Mill,

> [T]he peculiar evil of silencing the expression of an opinion is, that it is robbing the human race… If the opinion is right, they are deprived of the opportunity for exchanging error for truth: if wrong they lose, what is almost as great a benefit, the clearer perception and livelier impression of truth produced by its collision with error.[105]

Truth, therefore, is the primary goal of the First Amendment; without open and free discussion, the truth is obscured. At first blush, truth does not seem to be a primary concern of the First Amendment. In fact, since it protects false statements in addition to true statements, it appears that truth is not even considered. But, as Mill points out in *On Liberty*, a true statement can only be a living truth if it is frequently challenged and discussed.[106] Without discussion, truths become nothing more than "dead dogma," something people accept as true, but do not truly understand.[107] Truth requires discussion and debate. Much like fire in the kiln strengthens

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[104]   JOHN STUART MILL, ON LIBERTY, 18 (Stefan Collini ed., Press Syndicate of the Univ. of Cambridge)(1859).

[105] MILL, *supra* note 104.

[106] MILL, *supra* note 104 at 37.

[107] MILL, *supra* note 104 at 37.

pottery, so too does debate strengthens truth. Mill believed that the truth is revealed by debate and that truths previously accepted as undeniable are revealed to be half-truths or falsities.[108] Thus freedom of discussion is essential to advancement. Mill's philosophy was introduced to American jurisprudence by Justice Holmes in his dissent in *Abrams v. United States* where he noted "the best test of truth is the power of thought to get itself accepted in the competition of the market."[109] From then on, robust debate and the search for truth became fundamental to the concept of free speech.

By robbing users of the information and complex understanding necessary to engage in robust debate, web personalization undermines the search for truth. The filtering-out of non-personalized information makes it difficult for people to access all the information necessary to fully understand and analyze competing ideas. Additionally, by isolating people, filtering limits user opportunities to see opposing arguments and truly engage in discussion. If people are cannot access contradictory information, they cannot actively engage in a search for the truth because the clash of ideas is a necessary component of the search.[110]

Because Mill's ideas about the search for truth form a fundamental basis of First Amendment jurisprudence,[111] they are also critical to the debate about web personalization. Web personalization does not directly impede the search for truth. One could even argue web personalization does not infringe upon the right to free expression at all. Since, limited access to information does not inhibit a person's ability to debate or discuss issues, the argument goes, freedom of expression is unaffected. But such a narrow analysis of the impact of web personalization is disingenuous; rather than considering First Amendment values, it focuses solely on a technical reading of the amendment. One must consider web personalization through wide lenses. Although web personalization does not violate the letter of the law,[112] it violates the spirit of the amendment as articulated by Mills.[113] By limiting a person's ability to access contradictory or challenging information web personalization obstructs their search for truth.[114]

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[108] MILL, *supra* note 104, at 37.

[109] Stanley Ingber, *The Marketplace of Ideas: A Legitimizing Myth,* 1984 DUKE L.J. 1, 3 (1984). (quoting *Abrams v. United States,* 250 U.S. 616 (1919) Holmes, J. dissenting.)

[110] MILL, *supra* note 104 at 37.

[111] Stanley Ingber, *The Marketplace of Ideas: A Legitimizing Myth,* 1984 Duke L.J. 1, 7 (1984)

[112] U.S. CONST. AMEND I ("Congress shall make no law…abridging the freedom of speech.").

[113] MILL, *supra* note 104, at 52 ("They are adduced to show, by admitted and multiplied examples, the universality of the fact, that only through diversity of opinion is there, in the existing state of human intellect, a chance of fair play to all sides of the truth.").

[114] MILL, *supra* note 104 at 48 ("Truth, in the great practical concerns of life, is so much a question of the reconciling and combining of opposites, that very few have minds sufficiently capacious and

As noted earlier, six out of ten Americans get their news from social media.[115] If social media sites do not present all perspectives on a story, users are pigeonholed into particular viewpoints[116] and isolated from people who do not agree with them, limiting the possibility of discovering the truth. Many people would argue that even if users were given the opportunity to discuss and challenge one another's opinions, staunch partisan or sectarian views would not be cured by discussion. Mill answers this by noting that although discussion may not move "the impassioned partisan", it does benefit "the calmer and more disinterested bystander."[117] And by moving these bystanders toward the truth, society as a whole is pushed toward the truth. It is this broader march toward truth that Mill concerns himself with, not each individual's search.[118] Truth, however, relies on individuals being able to challenge and question it. As Mill's says, "truth gains more even by the errors of one who, with due study and preparation, thinks for himself, than by the true opinions of those who only hold them because they do not suffer themselves to think."[119]

The First Amendment focuses on government interference with free speech, but Mill focuses on the government as a body of people, a society, not just an entity.[120] Specifically Mill says that "protection… against the tyranny of the magistrate is not enough; there needs protection also against the tendency of society to impose, by other means than civil penalties, its own ideas and practices as rules of conduct on those who dissent from them."[121] Although the First Amendment does not prohibit extra-governmental limitation on free speech, most scholars and First Amendment experts recognize society's ability to burden free speech. Even in 1859 Mill recognized that society, apart from government, could limit free speech.[122] Web personalization exemplifies this concern.

While Mill focused on the search for truth as the foundation of the First

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impartial to make the adjustment with an approach to correctness, and it has to be made by the rough process of a struggle between combatants fighting under hostile banners.").

[115] Jeffrey Gottfried & Elisa Shearer, New Users Across Social Media Platforms 2016, Pew Research Center 2 (2016)

[116] PARISER, *supra* note 41 at 112 ("Most personalized filters are based on a three step model. First, you figure out who people are and what they like. Then, you provide them with content and services that best fit them. Finally, you tune to get the fit just right. Your identity shapes your media. There is just one flaw in this logic: Media also shape identity.")

[117] MILL, *supra* note 104, at 54.

[118] MILL, *supra* note 104, at 18.

[119] MILL, *supra* note 104, at 34.

[120] MILL, *supra* note 104, at 7.

[121] MILL, *supra* note 104, at 7.

[122] MILL, *supra* note 104, at 7.

Amendment, Alexander Meiklejohn focused on democratic self-governance.[123] According to Alexander Meiklejohn, "[t]he principle of the freedom of speech springs from the necessities of the program of self-government."[124] For self-government to truly work, citizens must face questions of policy with open minds; they must be willing to hear the ideas and opinions of their fellow citizens.[125] Democratic debate, which focuses on questions of governance and policy, is essential.[126] Without it our system of government would breakdown. [127] But, if democratic debate is the fundamental value underpinning the First Amendment, then all speech is not created equal.[128] To wit, Meiklejohn believes the guarantees of the First Amendment apply only to speech which bears upon issues that voters must grapple with, while private speech rests outside its purview, governed only by the Fifth Amendment.[129]

Meiklejohn's "democratic speech only" interpretation of the First Amendment suggests that the legislature has the power to impose some limitations on private speech, to ensure that democratic debate remains unobstructed. This also highlights the issues caused by web personalization, which frequently impacts a citizen's ability to engage in democratic debate[130]. Web personalization limits users' access to information and creates echo chambers which, inhibit honest and open discussion about policy issues.[131] Such discussion is necessary for true self-government. It is the foundation of our country and requires robust public debate. By dividing public and private speech into two categories protected by two different amendments, Meiklejohn gave primacy to one type of speech.[132] Speech directly associated with democratic debate, which is protected by the First Amendment, cannot be infringed, but private speech, protected by the Fifth Amendment can be as long as a speaker was given due process of the law.[133]

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[123] ALEXANDER MEIKLEJOHN, FREE SPEECH AND ITS RELATION TO SELF-GOVERNMENT, 26 (1948).

[124] MEIKLEJOHN, *supra* note 123, at 26.

[125] MEIKLEJOHN, *supra* note 123, at 27.

[126] *Id.*

[127] *Id*.

[128] MEIKLEJOHN, *supra* note 123, at 94.

[129] *Id.* According to Meiklejohn, the First Amendment protects the ability to discuss and contemplate issues related to democratic self-governance. The Fifth Amendment on the other hand ensures that an individual is not deprived of their private right to speech without the due processof the law. Thus, Meiklejohn distinguishes between the public and private right to free speech.

[130] *See Infra* Problems with Personalization

[131] PARISER, *supra* note 41.

[132]MEIKLEJOHN, *supra* note 123, at 94.

[133] *Id.*

B. Freedom of Press and Web Personalization

Despite their differing views, Mill and Meiklejohn both consider freedom of speech from an individual rights perspective. This is consistent with the interpretation of the majority of the Bill of Rights. The one glaring exception is the Press Clause. The Press clause is often viewed from the lens of the institutional press, rather than from an individual rights perspective. When, considered from an individual rights perspective, the Press clause can be interpreted as protecting an individual's right to record, publish, and access information. Unlike speech which is innately fleeting, published works, whether written or recorded, are lasting and can be communicated and archived for a longer period of time than speech. It is that ability to record, archive, and access information which underlies democratic debate because it helps guarantee an informed citizenry. Information is only valuable if it can be communicated and accessed. When considering regulations pertaining to Google's search engine or Facebook's newsfeed, it is important to consider the individual rights contained within the Press clause and balance those rights against Google's right to free speech. Such regulations should still be strictly scrutinized to ensure that they do not impose government opinions or ideas on individuals or corporations, but corporations like Google, which increasingly control information and news in the United States, should not be given free rein to determine which information is presented to an individual. The government therefore not only should strive to protect an individual's right to free speech, but also should protect the right of free and uninhibited access to information

IV. METHODS FOR LIMITING THE NEGATIVE IMPACT OF WEB PERSONALIZATION

The Speech and Press clauses highlight the importance of the free flow of information and ideas. Without the liberties protected by the First Amendment, U.S. citizens could not effectively exercise democratic self-government. Although, web personalization undermines the First Amendment core values, as expounded by Mill and Meiklejohn, web personalization does not itself violate the Amendment's mandate. Therefore, to ensure the survival of these principles, reformers and legislators concerned with the threat of web personalization must consider

solutions that protect the spirit of the First Amendment without actually invoking it. There are a number of possible approaches, including both governmental and non-governmental solutions. Devising and implementing a workable plan, although, will require creativity and flexibility.

A. Government Regulation

To properly balance the Press clause's right to access and Meiklejohn's focus on democratic debate against Mill's insistence on Google's right to free speech, government regulations should focus on process rather than content. Focusing on process makes it less likely that the government will undermine the right to free speech. For web personalization, the easy means of regulation would be to control how personalization is presented to users. Currently, Google operates under an opt-out policy. That is, users may opt out of personalized search, but the default setting is personalization. Although this policy may seem fair because it offers users a choice, the structure of the choice innately favors personalization. First, the policy is not stated on Google's web page. So, a person viewing Google's home page would have no idea that their search results are being personalized. Second, Google does not actively advertise their search protocols Users likely are unaware of how search algorithms work and what information is being considered in addition to their search terms. Lastly, users are unlikely to opt out of policies. When the effects of a policy are not readily visible and the process for opting out of the policy requires several steps, users are unlikely to go through the process.[134] Additionally, users are unlikely to truly understand the nature of the biases created.[135] Humans innately seek out information that confirms their beliefs.[136] Users, then, are unlikely question the results they receive. All of these factors weigh in favor of an opt-in policy, which would help protect individuals' right to access.

The strongest argument against such a policy is that it unduly burdens the companies' First Amendment right to free speech. For example, in *Search King v. Google*, Google successfully argued that the First Amendment protected its PageRank formula and accompanying results

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[134] The Opt-out Option, Association for Psychological Sciences (last visited Oct. 26, 2017), https://www.psychologicalscience.org/news/minds-business/the-opt-out-option.html.

135 Don't Trust that Algorithm, Harvard Gazette (last visited Oct. 26, 2017), https://news.harvard.edu/gazette/story/2016/10/dont-trust-that-algorithm/.

[136] Ann Ford, *The Surprising Speed with which we become Polarized Online,* KELLOG INSIGHT, (last visited Septmember 26, 2017), https://insight.kellogg.northwestern.edu/article/the-surprising-speed-with-which-we-become-polarized-online.

were protected by the First Amendment as editorial discretion.[137] Also, in *Google First Amendment Protection for Search Engine Search Results,* Eugene Volokh and Donald Falk argue that based upon Supreme Court precedent, search results are properly protected by the First Amendment.[138] Specifically, they compared the work of search engines to that of editors and publishers, which have long been protected by the First Amendment.[139]

Although, there are a number of arguments in favor of limited web personalization regulation, especially a regulation as minimal as a mandatory an opt-in policy. First, the individual right to access unbiased and independent information, underscored by the First Amendment, should be protected. The Supreme Court in *Red Lion Broadcasting Co. v. FCC,* "it is the right of the viewers and listeners, not the right of the broadcasters, which is paramount."[140] Similarly, when considering regulation of personalization, the right of users, not editors, is paramount. Whether the First Amendment is intended to safeguard self-governance or is designed to help individuals search for and discover the truth,[141] it is clear that web personalization poses serious threats to freedom of expression by limiting user access to information, often without their explicit consent. The massive impact personalization has on democratic debate and freedom of thought far outweigh the threat to free speech posed by a regulation that simply requires companies to adopt an opt-in policy for web personalization. Additionally, there is a history of government regulation of corporate speech. Most prominent among these regulations are those regulating advertising and mandatory Likewise.[142] In both of those cases the focus is on consumer protection or individual rights. Similarly, a mandatory opt-in policy focuses on transparency and user protections.

Second, requiring Google to shift from an opt-out policy to an opt-in policy does not regulate the content of Google's speech. Rather it regulates the "time, place, or manner of the speech."[143] Time, place, and manner

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[137] Search King, Inc. v. Google Tech., Inc*.,* No. CIV-02-1457-M, 2003 U.S. Dist. LEXIS 27193 (W.D. Okla. May 27, 2003) (*see also* Mark Joseph Stern, Speaking in Code: Are Google Search Results Protected by the First Amendment, http://www.slate.com/articles/technology/future_tense/2014/11/are_google_results_free_speech_ protected_by_the_first_amendment.html).

[138] Eugene Volokh and Donald Falk, *Google First Amendment Protection for Search Engine Search Results*, 8:4 JOURNAL OF LAW AND ECONOMIC POLICY 883 (2012).

[139] *Id*. at 899.

[140] Red Lion Broad. Co. v. FCC, 395 U.S. 367, 390 (1969).

[141] MILL, *supra* note 104.

[142] *E.g.* 15 U.S.C. § 45 (2006); 15 U.S.C § 78b (2010).

[143] Cox v. Louisiana*,* 379 U.S. 536, 557 (1965); *id.* at 554 ("From these decisions, certain clear

regulations "must be narrowly tailored to serve the government's legitimate, content-neutral interests," which means regulations must "promote a substantial government interest that would be achieved less effectively absent the regulation." [144] In this instance, the key question is whether the government interest is content neutral. Although the government intends to regulate the breadth of information users can access, the government does not attempt to regulate the type of content users may access. Rather the government is attempting to regulate the manner in which information is presented to the user. Google already provides users with the option to opt-out of personalized search. As such the government is not forcing Google to promote or use a new search algorithm. Nor is the government forcing Google to abandon their current algorithms. Since the government is not dictating the content of Google's speech, strict scrutiny does not apply,[145] which gives the government more flexibility in its approach to regulation.

Alternatively, the government could use consumer protection law. The Federal Trade Commission is authorized to pursue action against companies for the use of unfair or deceptive practices.[146] Although personalization does not qualify as an unfair practice under section five of the Federal Trade Commission Act, it could qualify as a deceptive act. To qualify as deceptive, the act or practice must: (i) mislead the consumer; (ii) the consumer's interpretation of the act or practice must be reasonable; (iii) and the act or practice must be material.[147] Since most companies do not notify customers of personalization, consumers are being deceived. This is especially true in cases where users signed up or used the site before personalization algorithms were introduced. Whether these deceptions are material and affect commerce, however, is up for debate. Yet, it is simple to connect web personalization to commerce.[148] As noted earlier, social media sites and search engines are in the data business, making web personalization is a key component of their business models.[149] What is more difficult is showing how personalization is material. In order to show materiality, it is necessary to show that the user would not have used the site

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principles emerge. The rights of free speech and assembly, while fundamental in our democratic society, still do not mean that everyone with opinions or beliefs to express may address a group at any public place and at any time.").

[144] Ward v. Rock Against Racism, 491 U.S. 781, 799 (1989).

[145] R. Randall Kelso, *The Structure of Modern Free Speech Doctrine: Strict Scrutiny, Intermediate Review, and "Reasonableness" Balancing,* 8 ELON L.REV. 291 (2016).

[146] 15 U.S.C. §45(a).

[147] Federal Deposit Insurance Corporation, FDIC Compliance Examination Manual, November 2015 (2015).

[148] PARISER, *supra* note 41.

[149] PARISER, *supra* note 41.

if they knew about personalization.[150] This could prove difficult because users are often unaware of personalization or lack viable alternatives to websites that provide similar services without personalization. Additionally, web personalization does not interfere with the services provided and does not cause a concrete harm to the individual consumers. Although both of these issues will present problems, the Federal Communications Commission could still wield substantial power over companies by including clauses about personalization in consent agreements or by investigating the practices surrounding personalization.[151]

B. Non-Governmental Solutions

Since government regulation may run afoul of the First Amendment, entities outside of the government maybe better equipped to solve the problems created by web personalization. Many industries, such as journalism and library science, have created their own codes of ethics and rules.[152] But, the problem with web personalization is that it cuts across a number of industries and is not as easily remedied with a code of ethics. A code of ethics requires control over the final product and often personalization algorithms incorporate artificial intelligence or machine learning, [153] making it virtually impossible to predict the outcome of the algorithm in advance.[154] Therefore, it will be difficult for the industry to

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[150] CFPB Consumer Law and Regulations: Unfair, Deceptive, or Abusive Acts or Practices at 6, October 2012, (last visited September 26, 2017),
https://www.cfpaguide.com/portalresource/Exam%20Manual%20v%202%20-%20UDAAP.pdf.

[151] A consent decree is a document issued by the FCC and signed by the regulated corporation or company that resolves disputes without an admission of guilt. It usually outlines remediation requirements, fines, and continued monitoring.

[152] In the legal profession, the American Bar Association established a standard of conduct for practitioners and self-polices its ranks. Additionally, it determines acceptance into the practice. (*See* the American Bar Association website,
http://www.americanbar.org/about_the_aba/governance_policies.html). Similarly, the American Library Association created a code of ethics, which enshrines the values of intellectual freedom and privacy. (*See* Code of Ethics of the American Library Association, http://www.ala.org/advocacy/proethics/codeofethics/codeethics). The Society of Professional Journalists have a code of ethics that expound values such as "minimize harm" and "seek truth in reporting." (*See* SPJ Code of Ethics, http://www.spj.org/ethicscode.asp).

[153] "Machine learning is a method of data analysis that automates analytical model building. Using algorithms that iteratively learn from data, machine learning allows computers to find hidden insights without being explicitly programmed where to look." http://www.sas.com/en_us/insights/analytics/machine-learning.html.

[154] According to Suresh Venkatasubramanian, Associate Professor at the School of Computing, University of Utah, "machine learning algorithms aren't sequences of well-defined instructions solving

create meaningful mechanism for protecting against echo chambers and censorship. Attacking the problem requires the industry to consider how the algorithms are designed and coded, as well as how they are implemented and presented to users.

During the design phase, data scientists have great flexibility in determining how they will model and write an algorithm. By creating standard considerations for data scientists and training them on social issues, such as the implications for democracy, data scientist can better create algorithms to achieve their goals, without creating second and third order effects. As the first step to this approach, data scientists need training on the social implications of their work. Mathematicians, computer scientists, and engineers, the people coding these algorithms, are taught to focus on the outputs of the algorithms but they need to learn about the broader social constructs impacting the algorithms. If data scientists learn about the impact their algorithms have on how users interact and think about information, they will be better able to design the algorithms to minimize harm. Additionally, they could explicitly include data or mechanisms within the algorithm to counteract any hazardous effects, for example search algorithms could be set up so they randomly include results that do not align with the user's personal profile, giving users the chance to decide what information they would like to examine. By allowing users to filter information for themselves rather than purely algorithmically, companies will be encouraging independent thought. Data scientists could also consider how the inputs inadvertently affect an algorithm's output. Often people assume algorithmic decisions are less biased than their human counterparts, but algorithms take on the biases of their input data.[155] With machine learning, data scientists can also build in unintended biases as new information is gathered. By creating a standard for testing and preventing algorithmic biases, data scientists can protect against some of the harms caused by personalization.

Moving to the implementation and presentation phase, transparency is the key. Users are often unaware of how algorithms operate or exist.[156] By

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well-defined problems...rather, they are algorithms for making algorithms, meta-algorithms." "Even the people building meta-algorithms can't be quite sure what they'll spit out, and what unintended consequences the results will have." Suresh Venkatasubramanian, *Algorithmic Fairness: From Social Good to a Mathematical Framework*, http://blogs.lse.ac.uk/mediapolicyproject/2016/06/14/algorithmic-fairness-from-social-good-to-a-mathematical-framework/.

[155] PARISER, *supra* note 41, at 203 ("A simple coded rule that bars people from one group or class from certain kinds of access is easy to spot, but when the same action is the result of a swirling mass of correlations in a global supercomputer, it's a trickier problem.").

[156] PARISER, *supra* note 41, at 202 ("This is already true to a degree with Google's search

simply notifying the user of the purpose of algorithms and the basics of how they work, corporations give users a choice. Users can decide whether to engage with the website and the extent of their engagement. Going further, companies could notify users of any major changes to the algorithms and how they affect the website. Companies could also create an opt-in policy that requires users' election to participate in personalization, rather than automatically enrollment. Additionally, corporations could give users more flexibility to provide feedback about the output of algorithm. Users could perhaps determine when their data could be used in future iterations of an algorithm or they could be allowed to scrub the data feeding the algorithm. Finally, corporations could include a standard sign or symbol on their sites indicating that personalization is used. Even a small reminder on the website will help users counter the effects by tailoring their searches or seeking out diverse viewpoints.

CONCLUSION

Personalization has drastically changed how users interact with the internet. Users are inundated with information from searches and social media, but they are often not aware that this information is personalized. As personalization of this type has become more prevalent it has created echo chambers, which challenge the fundamental basis of democratic government. As policy makers and scholars grapple with how to counter the rapid breakdown of open political debate they must remember to consider the values underpinning the First Amendment.

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algorithm. Even to its engineers, the workings of the algorithm are some-what mysterious.").