The Network and the Demos: Big Data & the Epistemic Justifications of Democracy

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Making political discourse private risks undermining the public discussion of political views and identities. A stable democracy requires a shared identity and political culture, a common *demos*, to prevent it fracturing into separate political communities. This in turn necessitates some common communication network for political messages to be transmitted, understood, and evaluated by citizens. Hence, what demarcates one demos from another are the means of communication connecting the citizens of those *demoi*, allowing them to debate and persuade each other on the proper conduct of government and on issues of common interest.

For the ancient Athenians, their public sphere was the Agora (marketplace); for the Federalists in the American colonies, the newspaper; for us today, it is the Internet. Until now, the physical nature of these communication networks has resulted in a trade off between the reach of political messages (the numeric and geographic composition of the demos who receives political messages and may participate in the public sphere) and the ability to target the content of a message on that network toward individual citizens.

One-to-one interpersonal conversation in the Agora was highly targeted but could reach only as far as a voice could be heard. The speakers and audience were well known to each other through personal interaction. As the printing press and later television allowed for greater and greater reach, the content of these messages became more generic as the speakers became more distant from their audience. The wider the audience grew, the less a message could be targeted at a particular audience segment without alienating others. The risk to reputation and credibility that making false claims and conflicting promises to different groups increased as more people could receive messages and identify contradictions and errors to the rest of the audience.

The Internet and big data analytics have changed the nature of political communication by decoupling message reach from message targeting. It allows individually tailored content to be distributed on a global scale without fear that the content of those messages will be overheard by others who may contest or reject it. Politicians are freed from the constraints imposed on what they say by the public presentation and discussion of arguments and claims. It frees political actors to engage in sophistry and demagoguery.

In this chapter, we explore what impact this decoupling has on democracy. We describe how political discussion in democracies has changed over time, as both communication technology and the number of people included in the demos have changed. We show that communication technology has previously increased the reach of political messages while also making such messages more public and less targeted towards particular individuals or groups. We then show how social media and big data combine to create echo chambers of political discourse that undermine the role that epistemic and cognitive diversity play in underpinning epistemic justifications of democracy.

# Part I - Democracy and Demagoguery

Plato is infamous for his disdain of democracy. He held that decisions made by an unskilled and uniformed demos will always be inferior to those of philosopher-monarchs. Democratic policy will be determined by base desire rather than reason. A state ruled by the people will inevitably succumb to the siren’s song of a persuasive orator whose lust for power and manipulation of the masses can only result in tyranny. To rule well, one must have expertise, knowledge, and wisdom. It is obvious then that the decisions of an epistocracy will be superior to the decisions of a democracy. 2,000 years later, Sir Francis Galton harboured similar thoughts about decision making. He was surprised to discover, however, that after calculating the results of 787 bets on the estimated weight of an ox at a country fair, the median result of the *vox populi* was within 0.8% of the actual weight (Galton 1907).

This unexpected result highlights the intriguing epistemic value of collective decision making involving disparate actors - that whenever people of diverse cognitive ability reason collectively in a setting that rewards truth tracking, the collective judgment will be, probabilistically at least, superior to the judgment of any one individual.

Whilst Plato may have preferred an epistocracy, scholars since the enlightenment have been illustrating democracy’s epistemic power. Rousseau thought that individuals stating their opinion on a matter by voting would elicit the general will of the people, a general opinion that would be superior than one’s own (Rousseau 2012). Mill (1977, chapter II) argued that free expression in public debate allows us to exchange our errors for truth while Dewey saw democracy as a way to share the rich store of accumulated wealth of human knowledge (Simon and Levine 1991).

These epistemic justifications of democracy have seen a resurgence in contemporary political theory in a range of accounts such as public reason (Rawls 2005), deliberative democracy (Habermas 1989, Goodin 2017), and procedural accounts (List and Goodin 2001, Estlund 2009). Despite their diversity in how they justify democratic legitimacy, epistemic accounts are united in their claim that democratic processes are better, on average at least, at tracking the truth on particular matters than any one individual is.

Plato’s scepticism of democracy’s epistemic value is justified, however, when one considers the cognitive capacities and skills of its individual constituents. For over 50 years, political and social scientists have been documenting how poorly informed the voting of democratic citizens is (Converse 1964). News polls regularly show how widespread the public’s lack of basic political knowledge and belief in untruths are. Two thirds of American voters, for example, cannot correctly identify the three branches of government (Shenkman 2009, 4).

Yet even if citizens had the means and motivation to become adequately informed on all matters political, it is doubtful that they would even be capable of reasoning about policy rationally. Cognitive psychologists have documented an enormous range of biases and flaws in everyday human reasoning: the difference between how we should reason as rational beings, and how we actually reason. We accept things as true based not on their merits but on how easy they are believe, or how good they make us feel (Frederick 2005). We form conclusions before we examine our premises (Tversky and Kahneman 1973). We make different decisions with the same information depending on the order it is presented (Hogarth and Einhorn 1992). We value avoiding losses far more than gaining the same amount (Tversky and Kahneman 1992). We seek out evidence like to confirm our prior beliefs and avoid evidence likely to refute it (Nickerson 1998) and we believe things are true long after being shown they are false (Anderson, Lepper, and Ross 1980).

Education and intelligence don’t make us immune from reasoning irrationally about politics. When presented with empiric claims about cause and effect, increasing numeracy increases one’s ability to reason correctly about scientific claims but decreases one’s ability to reason correctly about the same claims when presented as policy choice (Kahan et al. 2017). Our need to maintain congruence with our political identities trumps our desire to reason coherently about politics and these effects seem magnified by our reasoning skills.

Yet democratic decision processes, whether merely aggregative like voting, or transformative like deliberation, somehow manage to overcome these foibles of individual cognition and values to produce a collective epistemic virtue that is superior to that of any one individual. In a purely aggregative account of democracy such as Condorcet’s Jury Theorem, voters need not interact beyond voting for majorities to deliver these superior epistemic outcomes. Condorcet’s Jury Theorem is a mathematical proof that shows so long as voters on average have a better than even chance of being correct on some issue, the likelihood of the majority vote being correct approaches certainty as the number of voters increases (Condorcet 1976).[[1]](#footnote-2) To give the theorem some concrete context, if the average competence of the electorate is just 51% (marginally better than a coin flip), then the majority vote of 101 voters has a 57% chance of being correct, and that of 10,001 voters has a 99.99% chance.

Underpinning the superiority of collective over individual decision making in aggregative accounts like the Jury Theorem is the nature of randomness in our imperfect reasoning abilities. As we have seen, human cognition has many biases that lead to faulty and inconsistent reasoning. Yet if these random errors are normally distributed across large numbers of individuals, the errors will cancel each other out and an accurate approximation to the truth will be uncovered.

Transformative accounts like deliberative democracy take these epistemic claims further. Comprehensive and informed public discussion of political issues surfaces multiple points of view. Robust and substantive debate ensures that matters are decided on their merits. The public nature of the deliberation helps identify flaws in one’s own reasoning and position. While the requirements and epistemic claims of deliberative accounts may seem overly demanding or utopian to realist perspectives, the epistemic power of deliberative decision making has been demonstrated empirically in both experimental and field settings (Fishkin 1997; Luskin and Fishkin 1999; and Neblo 2007).

Yet this justification of democracy on epistemic grounds presupposes that the participants in this public discourse are seeking the truth, that they are voting and deliberating authentically, and not seeking to manipulate the outcome of the process for their own benefit. As history has shown, however, self-interest can lead to the subversion of democracy’s truth tracking capabilities for private ends.

Political manipulators corrupt democracy by employing demagoguery and sophistry. They do so by exploiting the psychological disconnect between what people do believe and what people should believe. Demagogues seek and maintain political power by exploiting prejudice and ignorance within the citizenry, and by portraying themselves as the only solution to the society’s real or imagined problems. Sophistry on the other hand, uses argumentative and persuasive techniques to convince an audience of something even if it is inconsistent with the facts or the audience’s own stated beliefs and commitments.

# Part II - The Network & The *Demos*

The idea of democracy presupposes the notion of a *demos* - some determinate group of individuals who form a people. It is this people, and not some other, for whom democracy is the rule of, by, and for. A stable democracy requires a shared identity and culture. Its people need to identify as one group if they are to hold sufficient solidarity necessary for collective rule. This shared identity need not be exclusive. An individual may identify with multiple overlapping peoples but the individuals within a people must always identify as one.

A shared identity requires some means to share it. A *demos* requires some form of communication network for its culture, norms, and political messages to be transmitted, understood, and evaluated by its citizens. We define a political network then, as the communication network between individuals who share some common political identity. The senders and receivers of political information – both explicit political messages as well as common norms and cultural information – are its citizens. The set of nodes and connections between them constitutes a given demos. The pattern of these connections is the network’s topology which represents the political structure of the demos. In this light, democratic institutions can be conceptualised as mediated communication networks connecting private individuals (the citizens) with their collective identities (their citizenship). What demarcates one demos from another, then, is a function of the communication networks that connect the citizens of those *demoi*.

It is our contention that democratic societies require decentralised or peer-to-peer democratic topologies within their public spheres in order to realise the democratic demands of popular sovereignty and political equality. If citizens are to form a shared identify and engage in informed political discourse with each other, then they require a shared public forum to do so in. Autocratic societies, by contrast, require only centralised autocratic topologies. They require only a means for the ruler to communicate with citizens and not for citizens to communicate with each other.

Yet these political topologies are themselves a function of the communicative medium. In the early democracies such as Athens, communication was limited to face-to-face discussion or parchment. The extent of political communication was limited the range of one’s voice or how far a letter could be carried. The scope of shared political identity was therefore limited to one’s neighbours and neighbour’s neighbours.

In Athens, one could stand in the Agora and shout to be heard by all (and so broadcast the message), or one could whisper to individuals in private (narrowcast the message). The scope for sophistry was greatest in private. When conversing with an individual, one could develop a rich understanding of their values, motivations, wants and needs. One could craft a message that was highly targeted to maximally exploit this understanding and exploit the other’s cognitive biases for one’s own ends.

When speaking to all in the Agora however, the scope for sophistry was more limited. The increased diversity of individual values made specific appeals to emotion and authority more difficult as what might persuade some could dissuade others. Furthermore, because the agora was a forum of public debate, others were able to respond. Different perspectives could be offered and flaws in one’s argument could be easily identified by others.

A technological trade-off that helped keep democracy epistemically robust began to emerge. Because broadcasting in the Agora was simplex, that only one thing could be said at any one time, political messages were most effective when they were targeted to appeal to the largest part of the demos.

Because the simplex nature of broadcast messages limits their ability to discriminate message content between audiences, there is additional incentive to engage in truthful public discourse if one’s intent is to persuade. Truth, reason, and logic are effective ways to shape policy in democratic settings and this served to provide democracy with a degree of epistemic robustness from those seeking to manipulate the truth.

As communication technology developed, so too did the scope of political rule and association. The invention of the printing press and rise of pamphlets and newspapers as modes of political communication allowed for political messages to reach larger geographical areas and audiences, increasing the possible scope of democratic association. Communication via print was no longer ephemeral like speech but persistent. Unlike face-to-face discussion, these new technologies were mediated by a publisher, given them a degree of communicative privilege. No longer was political identity an emergent property of a decentralised network. Print allowed political identity to be constructed (Somers 1994) and the shared identity necessary for larger demoi had arrived. Democracies began to emerged from revolution in France and the American colonies, and suffrage expanded in the United Kingdom.

Unlike communication by letter or parchment, pamphlets and newspapers were available to all (who could read). It was the public character of print media that helped maintained democracy’s epistemic robustness against sophistry by individuals seeking to subvert the truth tracking characteristics of democratic procedures for their own gain. Attacks against the legitimacy of the political process, the media, and political opponents are all tools through which demagogues can undermine democratic political networks and turn them into more autocratic ones (Levitsky and Ziblatt 2018, 23–24). Nonetheless, these attacks are visible to all if they are conveyed via broadcast messages. Political manipulation carries reputational cost when publicly identified and alert citizens of the demos can respond to these attacks and defend the democratic nature of their political network.

The emergence of privately operated printing presses also tempered somewhat the communicative privilege of publishers and print’s more centralised topology. Private presses allowed a greater range of political messages to be produced and distributed, even if they were critical of the state (Benkler 2006, 186). Pamphlets served as public duplex communication, as individuals who disagreed could respond with political messages of their own in the same medium, much like the crowd of the Agora yelling back. The cognitive diversity and value plurality so essential for democracy’s epistemic virtue was maintained.

Yet print introduced a new characteristic that was previously absent from political discourse – anonymity. Printed messages allowed for the source of the message to be disguised, either by publishing them anonymously or by attributing them to a pseudonym. This anonymity can be used to enhance the truth tracking features of public discourse. When we lack any means to judge an author’s authority, we must rely instead on the the content of their message. We are less likely to filter their message through some prior belief we have about them and their motivations.While newspapers increased the reach of political messages, they also made political communication more unidirectional and simplex. While audience members could still respond in the same medium, it required finding a printer or newspaper willing to print their response. Duplex communication started to become a privilege as the costs of printing and distribution increased. The range and distribution of newspapers also began to change as industrialisation increased the economies of scale of newspaper printing (Benkler 2006, 187). Smaller, local newspapers found it more difficult to compete with cheaper, mass produced newspapers with larger geographical audiences. The developing asymmetry between active speakers and large, passive, and geographically dispersed audiences was further intensified by the development of radio and television in the 20th century.

Radio and television allowed messages to be broadcast across a geographical range unmatched by earlier technologies. Radio and television allowed governments to address their entire population instantly. These broadcast messages are accessible to all with the technology necessary to receive them. As a result, the message’s audience is the entire population, rather than specific sections of it. The simplex communication of these mass media networks from transmitters to passive receivers also makes them vulnerable to centralised control (Benkler 2006, 196). The operators of mass media broadcast networks enjoy significant communicative privileges, as they decide what messages and whether they are presented favourably

Yet the communicative privileges afforded to those who control mass media comes at the cost of the ability of communicating directly to a specific group without the rest of the audience receiving the same message. Mass media messages are expensive to produce, so speakers have strong motivations to make their messages acceptable to a broad audience. It becomes less cost effective to tailor political messages towards a specific group within the broader audience. The accessibility of broadcast political messages imposes its own constraints on the kinds of messages that are sent. Tailored messages that strongly resonate with specific groups may inspire greater resistance from other groups in the audience. Political speakers who utilise mass media therefore must either accept that their message will only resonate with a specific group (and that their target audience is sufficiently large to overcome the political backlash from other groups), or present messages that are interpreted differently by different groups, so that the target group hears a message that resonates strongly with them without antagonising the broader audience (i.e., ‘dog whistling’) (Goodin and Saward 2005, 471).

The development of personal computers and their connection via the Internet created new possibilities for computer-mediated communication (CMC) between individuals, regardless of their geographical proximity. Unlike the passive reception of messages via mass media, CMC is interactive (Ess 2004, 77). The arrival of the Internet was hailed as promising an ‘electronic Agora’, where all individuals could again have political discussions as equals (Rheingold 1994, 14).

# Part III - Big Data & Democracy

The dream of access to a world of diverse perspectives and informed political discourse seems a long way from the experience of many Internet users today. Yet the disconnect between the Internet’s promise for democracy and the reality of its threat to it is not the result of one thing but the confluence of two – the rise of social networks and big data analytics.

The network dynamics of contemporary online social media are diverse so it will be useful to examine how these affect the epistemic virtue of democracy. A social network is simply a form of computer-mediated communication designed to allow individuals to easily connect and interact with others across the Internet, both publicly and privately. Individuals can choose to follow accounts operated by individuals or groups that interest them. This presents strengths and risks to democracy’s epistemic claims to truth tracking. The freedom to follow other users in social media echoes the early Internet’s promise of decentralising political networks and reducing the communicative privilege of broadcasters. Diverse perspectives are allowed to flourish and network connections based on social proximity or shared interest help identify relevant new sources of information.

However, the same factors also present new risks. Users of social media networks also tend to associate with others who share the same interests and characteristics, an effect called homophily (Tufekci 2017, 9). While social networks make it easier for individuals to find others who share their interests, they also make it easier to limit interaction to those who share their views. Individuals on social networks share news stories and Internet sources that reflect their own views, and that are likely to interest their friends. The items posted are chosen to express an individual’s identity and affiliations (Vaidhyanathan 2018, 50).

Interactions in social media may be classified as open or closed. Open interactions are public in that they are accessible to other social network users. Examples of open interactions are Twitter and Instagram posts as both the followers of a particular account and other Twitter or Instagram users can access a user’s public posts from a URL. They are equivalent to broadcast messages on mass media or via traditional web pages in that they are accessible to all. Closed interactions are messages restricted to particular users, such as those following a particular account.

One risk to the epistemic virtue of democracy is that closed social networks appropriate the public sphere and make it private. Once private and shared only among similar individuals, political discourse loses some of its epistemic robustness as ideas are no longer challenged by diverse perspectives. Errors in reasoning become more difficult to identify owning to our biases that make objective evaluation of arguments congruent with our beliefs difficult (Taber and Lodge 2006). Another risk is that the cost of sophistry is reduced in private discourse. There is less chance that manipulative rhetorical techniques will be seen by those less sympathetic and who might be dissuaded by them.

Parallel to the rise of social networks was the rise of big data – the use of significant computation power to analyse large data sets to identify patterns that can be used to guide decision making (boyd and Crawford 2012, 663). By tracking an individual’s behaviour across millions of separate interactions online, huge databases of user analytics can be generated. Online activity can be matched against an individual’s offline behaviour from commercial datasets, purchasing history, cellular data, and voter roles to aggregate hundreds or thousands of individual demographic, geographic, and pyschographic data points into a behavioral profile. Statistical techniques such as machine learning are then used to find correlations between user characteristics until a predictive model of individual personality is developed.[[2]](#footnote-3)

Importantly, big data analytics provides the holders of the data with high fidelity insight into the effectiveness of political communication. A/B testing of websites and advertising, the process of randomly assigning different versions of a webpage or advert to users and measuring click-through rates to evaluate relative performance, have been embraced by political parties. Where once the effect of a skilled orator’s rhetoric had to be assessed by watching the reactions of the crowd, now web based sophistry can be measured with statistical precision. And when sophistry becomes more effective, the truth tracking propensity of democracy is placed at further risk.

It is the confluence of social media and big data analytics that now undermines the epistemic justifications of democracy. Social network operators use the interactions individuals have on their platform to refine the content presented to them in the future. This refinement tracks what content users interact with and displays more content similar to that in the future. The refinement is based on what individuals are likely to respond to, regardless of whether the content is accurate. The algorithms that determine what social media users see in the future are thus attention tracking, rather than truth tracking as we would desire from a credible news source.

The attention tracking nature of social media is guided by the need to gain advertising revenue. Advertisers are motivated to target groups and individuals most likely to respond to their messages. The attention tracking nature of social media is further illustrated by the emergence of hoax news sites that are concerned only with the amount of social media traffic they generate. While newspapers had reported hoaxes to increase circulation (and hence advertising revenue),[[3]](#footnote-4) such misinformation is broadcast, so that sceptical audiences and other news sources can debunk it. However, if hoax news stories are agreeable to users’ biases, they are likely to pass unchecked within groups that share similar views thanks to confirmation bias. Hoax news stories may therefore be narrowcast towards groups in the global audience that are likely to accept them.

This ability to tailor hoax stories to appeal to various groups without them being challenged by those outside of the target audience risks undermines the democratic norm of mutual toleration (Levitsky and Ziblatt 2018, 102). By exaggerating or fabricating reports of the actions and beliefs of political opponents, those who receive news that reflects and builds upon their existing biases are less willing to see their opponents only as rivals, but as malicious caricatures. This undermining of mutual toleration in turn damages the common identity of the demos as individuals within their separate echo chambers can no longer see each other as equals.

The capability of tailoring advertising to the interests of users also allows for tailored political messages to be directed towards those mostly likely to respond. Tailored advertising allows narrowcast political messages to be sent across communication networks of any size. This builds upon the duplex nature of communication via social media networks. Like a demagogue receptive to the verbal and non-verbal cues of face-to-face communication, those who send political messages across social media can quickly evaluate the effectiveness of their messages, and refine them accordingly. As the cost of sophistry has been reduced and its effectiveness improves, we are witnessing what has been dubbed computational propaganda – one of the most powerful new tools against democracy (Woolley and Howard 2017, 11).

These aspects of the combination of social media and big data analytics (the tendency towards homophily among users, the emergence of echo chambers, and the prominence of news items based on their ability to provoke responses) creates the new possibility for narrowcast political messages with a global reach. Narrowcast messages had previously been prohibitively difficult to transmit across communication networks with a considerable reach. The broadcast nature (and hence, public visibility) of political messages to geographically dispersed audiences had served to constrain the types of claims that could be made without being held accountable for them. Open interactions on social media also maintain a degree of public accountability as they are broadcast messages. As such, political messages on social media that favour open interaction (such as Twitter) are perhaps less of a threat to the ability of citizens to understand each other, since they can see the same messages. It is the tailoring of messages to elicit responses from specific groups without the knowledge of the broader community that is troubling for the mutual toleration necessary for the demos to maintain a common identity, and for citizens to maintain the ability to fruitfully discuss political issues among themselves.

# Conclusion

Democracy has surprising epistemic virtue when we consider the cognitive flaws of individuals who constitute the demos. Yet when we reason collectively in an environment that rewards truth tracking, our social cognition is superior to that of any individual. The benefits of deliberation are at their strongest when diverse views are aired in public and we are given the opportunity to discuss issues with others. Even in the presence of sophists and demagogues who corrupt the truth for their own ends, the technological features of our communication networks, the trade-off between the reach of a message and the ability to discriminate its content within an audience, has historically provided democracy with a degree of epistemic robustness. Democracies have developed alongside communication technologies that allowed broadcast messages across large geographical areas and populations at the expense of limiting the speaker’s amount to discriminate between different listeners.

While the Internet promised to reduce the communicative privilege of mass media broadcasters and return the public sphere to more decentralised and equal one, reality turned out differently. The confluence of social media and big data analytics has created new possibilities for political discourse which are global, multidirectional, and highly targeted. Social media offers the perfect platform for political speakers to tailor their messages for separate audiences, rather than offer messages that must resonate with sections of the audience while also avoiding antagonising others. This ability to communicate different messages to different sections of the demos, with a low possibility of these messages coming to the attention of those outside of their intended audience. Citizens of the demos who receive political messages tailored to their interests, informed by news that reflects their biases, and reinforced by echo chambers filled with others of similar views, risk losing the mutual toleration of citizens with differing political views. This risks undermining the common identity necessary for a stable democracy to sustain itself.

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1. The Jury Theorem makes a number of assumptions about voter competence, voter independence, and the objective correctness of some binary choice. Since Condorcet first published his theorem in 1785, many of these assumptions have been generalised, strengthening the robustness of its claim to justify democracy on epistemic grounds (see Baker 1976; Berend and Paroush 1998; Owen, Grofman, and Feld 1989; Kanazawa1998; Fey 2003; and List and Goodin 2001). [↑](#footnote-ref-2)
2. https://www.youtube.com/watch?v=n8Dd5aVXLCc [↑](#footnote-ref-3)
3. To give just one example, the *New York Sun* in 1835 printed reports of life on Mars (Wu 2017, 17–18). [↑](#footnote-ref-4)