

In Worship of an Echo



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The Internet is celebrated for disseminating knowledge and supporting conversation, dialogue, and debate. Anyone can post opinions, and no editor can stop you linking to something you like (or hate). Even the gatekeepers – search engines most obviously – are democratic.

Yet this happy characterization has been challenged by the counterargument that it can also be a tool for blanking dissent, and magnifying and reinforcing prejudice. For instance, an otherwise balanced review in *Wired* last year was headlined, “The Internet Glosses over Life’s Ambiguities with False Certainty, and We Do Little to Search Out These Important Grey Areas.”¹

Filtering and recommender systems have been deemed responsible.² Activist Eli Pariser argues that recommenders create a “filter bubble,” a “unique universe of information for each of us.”³ Technology supports tendencies to read and link to like-minded resources, which has been shown with political blogs among others.^{4–6} For Jaron Lanier, only the Internet as currently constituted could have produced such behavior, by supporting “anonymous, fragmented communication.” He contends that “new patterns of social connection that are unique to online culture have played a role in the spread of modern networked terrorism ... jihadi chat looks just like poodle chat.”⁷

This “echo chamber” effect not only coarsens online debate, but can be positively dangerous if the prejudices amplified are those of extremists with a grudge toward, or hatred of, the societies in which they live. Could the Internet provoke violence? Critic Stuart Sim has argued that certainty about simple panaceas is increasingly prevalent in the modern world;⁸ moreover, the Internet shelters conspiracy theories from objective criticism by selectively presenting evidence.⁹ Sociologist Eileen Barker argues that (for religious groups)

the Internet marginalizes heterodox information sources: “as such a polarized worldview could be endangered by qualifications or questioning, any middle-way option or ambiguity is likely to be demonized as part of the bad, the false, and/or the satanic alternative.”¹⁰

Jurist Cass Sunstein has argued that the Internet creates what he calls group polarization. As members recede into echo chambers, they tend to become less diverse, and the group more coherent. This promotes extremism, for three reasons. First, members are disproportionately exposed to persuasive arguments from one side only. Second, they adopt positions which look good to their peers. Third, increased solidarity leads to greater confidence. Hence, “from the evidence thus far, it seems plain that the Internet is serving, for many, as a breeding ground for extremism, precisely because like-minded people are deliberating with greater ease and frequency with one another, and often without hearing contrary views.”¹²

Radicalism, Extremism, and Policy

Let’s define *radicalism* as a belief/behavior nexus in considerable tension with the embedding society, and *extremism* as the violent pursuit of radical goals.¹¹ With this definition, radicalism per se isn’t a legitimate target of official policy, but extremism is. This is in direct opposition to the common policy goal of “de-radicalization,” which tries to prevent violent extremism by persuading radicals to moderate their views, on the assumption of a slippery slope (for which no evidence exists) from radicalism to extremism. Such strategies have hardly been evaluated,¹² but, regardless, an obvious tension is apparent in de-radicalization: terrorism is a crime, but radical ideology is protected as free speech.¹³

Nevertheless, if extreme ideology is a causal factor in violent extremism, and if the Internet

exacerbates radicalism by creating echo chambers, then clearly, Internet and Web regulation is a legitimate vector for security policy. Most governments would agree – the UK's Prevent strategy is influential and typical.¹⁴

De-radicalization as a strategy depends on the assumption that radical thought is the product of simple minds and irrational choices. A thought process that revels in clearly unsatisfactory conflict with an embedding society is surely contrary to self-interest, and will fade in the light of reason when people wise up to its silliness. There is a venerable tradition of commentators on the sociology, psychology, and anthropology of fundamentalism and religion – including Hume, Comte, Spencer, Freud, and, more recently, Richard Dawkins – that identifies its

But that's not my main point, here. However intuitive it seems, if the thesis has repercussions on the Internet, it must rely on an unusual pattern of influence. Technology isn't the homogeneous influence on an individual in a unidimensional social context that the DAM thesis seems to suggest. We have more friends than ever, we're anchored in our local geographic environments, and our online friends tend to be our offline friends as well, so attenuated transactions between online individuals via sculpted avatars play a relatively small role in our lives.^{16,17}

The growth of social networking sites has accelerated a trend for people to leave tight-knit groups. People are more individualistic, gaining much of the meaning and support in their lives

based on occupation, group membership, or some other characteristic... not all networks are equal. We suspect that when religion is the common thread that has woven a network together, the political information that circulates carries more moral weight – and is thus more persuasive.”¹⁸ Yet despite this, people find it easier to join, rejoin, and move between networks. Even if one network has an unhealthy effect on someone, it doesn't follow that it's the only influence on those within it.

How Do Bad Ideas Spread?

The echo chamber argument implies a thesis about how communications networks operate. Most important to an echo chamber is the existence of a highly interconnected subgroup, something like a clique or a cluster. A network of radicals must have relatively poor communication links outside the clique, and should be able to cut off communications from heterodox sources while providing good connections to orthodox adherents.

If a clique is important, how does it form? The attraction people of similar backgrounds feel is an important binding mechanism for groups. Most work on so-called homophily has focused on demographic similarities such as age, gender, and race. But this mechanism is no good for the echo chamber thesis, whose point is that people transcend demography and physical proximity with attractors based on ideology, religion, or a shared nihilistic disregard of embedding societies.

Homophily can therefore be only a partial explanation of how echo chambers develop (and not an explanation that implicates the Internet). The echo chamber thesis seems to imply a model of influence analogous to contagion, in which network properties facilitate or restrict the passage of particular views. In the echo chamber, the DAM individual is “infected” by the radical virus.

How might such contagion work? The echo chamber hypothesis implies that the group gradually reaches a

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drivers as irrationality, poor education, ignorance, lack of maturity, and low self-esteem. Stories of the rise of sects and cults (think of the Moonies or the Symbionese Liberation Army that kidnapped Patty Hearst) are told in terms of mass brainwashings and charismatic leaders preying on the emotionally and mentally vulnerable. Let's call this picture of the roots of extremist sects the Dumb-and-Malleable (DAM) thesis.¹¹

DAMnation

Is the DAM thesis tenable? Actually, it isn't. The evidence is powerful that people have perfectly rational reasons for joining radical and extreme cults – particularly, the valuable social good of belonging. The stricter the cult, the easier it is for it to repel free riders, and the more coherent the community.¹⁵

from looser networks. The result is a gain, for most people, at least, of flexibility, choice, and – germane to our inquiry – exposure to new viewpoints. This diverse jumble is harder for individuals to manage, but pays off via the spread of services and experiences we can receive.

For our purposes, this seems to imply that even if some networks have echo chamber properties, and even if some individuals thrive on, or seek out, such networks, no one is trapped by the technology without hope of relief. This isn't all or nothing: political scientists Robert Putnam and David Campbell found that many Americans' social networks were centered on their church, and that although “political messages can echo through any network of like-minded people, whether

consensus more extreme than the participants' starting positions. This suggests that interaction leads to similar attitudes. However, in most contagion theories, this principle is counterbalanced by reflected exclusivity – “the degree of influence person *j* has on person *i*'s evaluation . . . is inversely proportional to the amount of time *j* spends with all others.”¹⁹ Reflected exclusivity should prevent the inevitable homogenization of attitudes across a network, so in an echo chamber, we would expect conversely that it plays a relatively small role.

It follows that members' influence on each other within the chamber should be high, and therefore that their external networks are relatively insignificant, meaning that members don't look like typical networked individuals. However, it's unclear how the Internet could cause such alienation. If it did, then an individual would have to enter the echo chamber and somehow lose his or her diverse connections, to be replaced with more and stronger connections within the echo chamber. It's hard to see a mechanism for doing that, beyond brainwashing, bringing us back to the DAM thesis.

Hence, many individuals in the echo chamber must be more open to influence than is usual. Is that realistic? On the one hand, studies have shown that a church-goer's political views correlate more closely with the rest of the congregation's than do his or her own religious opinions,²⁰ while worshippers who draw on religion in making political judgments are also more likely to agree that religion influences decisions in their lives in other areas, such as family and career.¹⁸ But as Peter Monge and Noshir Contractor have argued, “in human interaction, messages containing different ideas, values, and attitudes flow back and forth among people as they negotiate resolutions.”²¹ The people in an echo chamber are surely unusual in the ease with which they are influenced, and once more, it's hard to implicate the Internet in that.

Public Spaces

The echo chamber thesis seems to require an unusual set of people related to each other in unusual ways. Could it really come to pass on the Internet? It doesn't seem intuitive. At first blush, the blogosphere looks like it functions as a space for public debate: it seems to have the four properties of “ideal speech situations” that Überdenker Jürgen Habermas describes:

- No one capable of making a relevant contribution has been excluded.
- Participants have equal voice.
- They are free to speak their honest opinion without deception or self-deception.
- There is no coercion built into the discourse.^{22,23}

discourse, blogging is an important area that could in the aggregate approach the ideal of disinterested debate (however partisan the individual blogs). A spat in the blogosphere sets important standards for deliberative politics.

The blogosphere isn't as polarized as it often seems. Only a very small number of sites never link to opponents, and most of them do so for a range of perfectly good reasons, wittingly exposing readers to opposition viewpoints.⁵ The blogosphere certainly reflects biases and slants, as do the mass media,²⁶ but, of course, the argument we're evaluating is that the Internet has created a qualitative change in favor of echo chambers, so mere bias isn't enough.

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Yet this is a picture Sunstein, for example, resists. “The challenge to the Habermasian understanding [of the blogosphere] is that because of self-sorting, people are often reading like-minded points of view, in a way that can breed greater confidence, more uniformity within groups, and more extremism.”²⁴ Political scientist Matthew Hindman has argued – on the basis of a survey of often-read bloggers – that participants don't have equal voice.²⁵ The Web's scale-free structure produces a Matthew effect (that's St. Matthew, no relation to Hindman), in which success reinforces success.

But aren't these quibbles? Surely neither censorship nor editing is a strong feature of the blogosphere. Although Habermas himself retreated from early hopes that ideal speech situations would guarantee ethical

In any case, not all political talk need be deliberative in the Habermasian sense, with an emphasis on discourse, rationality, and universality. There is a place for (some) echo chambers, as long as they don't dominate. David Weinberger, Howard Dean's senior Internet advisor in 2004, for instance, argued that echo chambers give groups important space for explicit reinforcement of their founding agreements. “On the lefty list, for example, we don't send a lot of messages that say Bush is a jerk, because we already agree on that and want to talk about what to do about it.” His conclusion about echo chambers is, “So what?”²⁷

These doubts have some support in the evidence. For instance, although a study about the 2010 US mid-terms showed that 55 percent of voters believed that the Internet increased

the impact of extreme views (against 30 percent who thought it reduced it), only 34 percent of voters who used the Internet as a source of news websites actually admitted to seeking out those that reinforced their viewpoint.²⁸

That was a survey. What about actual practice? A recent study of Facebook did show that partisans were likelier to share news from like-minded online sources, but does that justify the authors' policy claim that "It is important, then, to create alternative media that brings together left, right, and center"?²⁹ Sharing online news is an act of commitment and engagement, and interfering with that might intrude too far into private decisions. The original arguments against echo chambers (for instance, in the influential first edition of Sunstein's book³⁰) focused on unconscious exposure to alternative views (via unfiltered television, radio, newspapers, and demonstrations in public spaces) as the key corrective, and the counter to the decline of such exposure was never stronger than the presence of links to the opposition from partisan websites (which of course need not be clicked on). Even if this is an important issue for preserving democratic politics, few in the policy world understand access to alternative voices as meaning any more than making links available.

All in all, it seems to follow that the idea that the Internet supplies dangerous echo chambers for extremists and radicals doesn't have enough backing in the evidence to warrant strict remedial action. This shouldn't surprise us. Research into the facilitation of social networks by technology throws up paradoxes, not unequivocal effects.³¹ This could help answer our question of whether echo chambers support authenticity²⁷ or diminish it^{2,7}: where they exist, they can do both.

It's worth emphasizing that this isn't a problem that can be solved solely by crunching big data, tempting

though that thought might be. Politics doesn't have automatic answers. The question here isn't whether there are online echo chambers — that is indeed amenable to analysis given sufficient data. The key questions are whether the Internet has created more echo chambers, or made them more common, or increased the likelihood that someone will get entangled in one, and if so, whether this is a bad thing. Data gleaned from Internet use is silent about the offline standard of comparison, and certainly won't settle questions of value.

Complex societies of individuals can partition themselves without any help from digital technology. As early as 1844, Marx's collaborator Engels described Manchester as a series of class-based echo chambers:

The town itself is peculiarly built, so that someone can live in it for years and travel into and out of it daily without ever coming into contact with a working-class quarter or even with workers — so long, that is to say, as one confines himself to his business affairs or to strolling about for pleasure. This comes about mainly in the circumstances that through an unconscious, tacit agreement as much through conscious, explicit intention, the working-class districts are most sharply separated from the parts of the city reserved for the middle class.³²

This isn't to say that dangerous ideas don't spread online — of course they do. No doubt more people are exposed to them than in the analogue era. But more people are exposed to the mainstream as well. The Internet is a conversation, and trying to seal it off from challenging ideas will have no effect on the supposed echo chambers of radicalism, while fatally undermining the conversation. ☐

Acknowledgments

This work is supported under SOCIAM: The Theory and Practice of Social Machines,

funded by the UK Engineering and Physical Sciences Research Council (EPSRC) under grant number EP/J017728/1. My thanks to David Stevens of the University of Nottingham for many discussions on this topic.

References

1. A. Martin, "The Web's 'Echo Chamber' Leaves Us None the Wiser," *Wired*, 1 May 2013; www.wired.co.uk/news/archive/2013-05/1/online-stubbornness.
2. C. Sunstein, *Republic.com 2.0*, Princeton Univ. Press, 2007.
3. E. Pariser, *The Filter Bubble: What the Internet Is Hiding from You*, Penguin, 2011.
4. L.A. Adamic and N. Glance, "The Political Blogosphere and the 2004 US Election: Divided They Blog," *Proc. 3rd Int'l Workshop Link Discovery*, 2005, pp. 36–43.
5. E. Hargittai, J. Gallo, and M. Kane, "Cross-Ideological Discussions among Conservative and Liberal Bloggers," *Public Choice*, vol. 134, 2008, pp. 67–86.
6. R. Lucioni, "Voting Relations between Senators," blog, 2013; <http://renzulocioni.com/articles/senate-voting-relationships/>.
7. J. Lanier, *You Are Not a Gadget*, Penguin, 2011.
8. S. Sim, *Fundamentalist World: The New Dark Age of Dogma*, Icon, 2004.
9. J. Kay, *Among the Truthers: A Journey Through America's Growing Conspiracist Underground*, HarperCollins, 2011.
10. E. Barker, "Crossing the Boundary: New Challenges to Religious Authority and Control as a Consequence of Access to the Internet," *Religion and Cyberspace*, M.T. Højsgaard and M. Warburg, eds., Routledge, 2005, pp. 67–85.
11. D. Stevens and K. O'Hara, *The Devil's Long Tail: Religious and Other Radicals in the Internet Marketplace*, Hurst, 2014.
12. J. Horgan and M. Taylor, "Disengagement, De-Radicalisation, and the Arc of Terrorism: Future Directions for Research," *Jihadi Terrorism and the Radicalisation Challenge: European and Am. Experiences*, 2nd ed., R. Coolsaet, ed., Ashgate Publishing, 2011, pp. 173–186.
13. R. Coolsaet, "Counterterrorism and Counter-Radicalisation in Europe: How Much Unity in Diversity?" *Jihadi Terrorism and the Radicalisation Challenge: European and Am. Experiences*, 2nd ed., R. Coolsaet, ed., Ashgate Publishing, 2011, pp. 227–246.

14. *Prevent Strategy*, report, UK Home Office, 2011; www.gov.uk/government/uploads/system/uploads/attachment_data/file/97976/prevent-strategy-review.pdf.
15. L.R. Iannaccone, "Why Strict Churches Are Strong," *American J. Sociology*, vol. 99, no. 5, 1994, pp. 1180–1211.
16. H. Wang and B. Wellman, "Social Connectivity in America: Changes in Adult Friendship Network Size from 2002 to 2007," *Am. Behavioral Scientist*, vol. 53, no. 8, 2010, pp. 1148–1169.
17. B. Wellman and C. Haythornthwaite, *The Internet in Everyday Life*, Blackwell, 2002.
18. R.D. Putnam and D.E. Campbell, *American Grace: How Religion Divides and Unites Us*, Simon & Schuster, 2010.
19. D. Krackhardt and D.J. Brass, "Intraorganizational Networks: The Micro Side," *Advances in Social Network Analysis: Research in the Social and Behavioral Sciences*, S. Wasserman and J. Galasiewicz, eds., Sage, 1994, pp. 207–229.
20. K.D. Wald, D.E. Owen, and S.S. Hill, "Churches as Political Communities," *Am. Political Science Rev.*, vol. 82, 1988, pp. 531–548.
21. P.R. Monge and N.S. Contractor, *Theories of Communication Networks*, Oxford Univ. Press, 2003.
22. J. Habermas, *Theory of Communicative Action Volume 1: Reason and the Rationalization of Society*, Polity Press, 1984.
23. J. Habermas, *Between Naturalism and Religion*, Polity Press, 2008.
24. C. Sunstein, "Neither Hayek nor Habermas," *Public Choice*, vol. 134, 2008, pp. 87–95.
25. M. Hindman, *The Myth of Digital Democracy*, Princeton Univ. Press, 2009.
26. Y.R. Lin, J.P. Bagrow, and D. Lazer, "More Voices than Ever? Quantifying Media Bias in Networks," Arxiv preprint, 2011; <http://arxiv.org/pdf/1111.1227.pdf>.
27. D. Weinberger, "Is There an Echo in Here?" *Salon*, 20 Feb 2004; www.salon.com/technology/feature/2004/02/20/echo_chamber/.
28. A. Smith, *The Internet and Campaign 2010*, Pew Internet and American Life Project, 2011.
29. J. An, D. Quercia, and J. Crowcroft, "Fragmented Social Media: A Look into Selective Exposure to Political News," *Proc. World Wide Web Conf.*, companion volume, 2013; <http://www2013.org/companion/p51.pdf>.
30. C. Sunstein, *Republic.com*, Princeton Univ. Press, 2001.
31. M. Tehranian, *Technologies of Power: Information Machines and Democratic Prospects*, Ablex, 1990.
32. F. Engels, *The Condition of the Working-Class in England in 1844*, George Allen & Unwin, 1892.

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