Social Media, Cognitive Dysfunction, and Social Disruption

Hal Berghel, University of Nevada, Las Vegas

How did social media produce an existential crisis for society?

According to Pew Research, 68% of adults in the United States use Facebook, 47% use Instagram, and 22% use X (Twitter).[1] By some estimates, 40% of the world's population uses social media.[2] That the appeal of social media is variegated by age, ethnicity, social status, etc., is widely recognized. But what is less recognized is the difference in appeal by individual characteristics such as personality type, biases, agendas, dispositions, and political affiliations. Further, the perceived value of social media varies by audience. For some it is a pleasant pastime, while for others it is a distracting time sink. Some perceive social media as a reliable source of information, while others see it as a tool for online manipulation and mischief. Some view it as a mechanism for social bonding, while others see it as an online partisan weapon. In short, social media means different things to different people and serves many different interests. Social scientists have been attempting to measure the various effects of social media use for decades but so far without general agreement. So we must conclude that the ultimate effect of social media on society remains an open question. Perhaps this is a good time to take a step back from attempting to assess the effects of social media and study it from the perspective of an online technology. We ask the question, Is there something significant about this particular online technology that separates it from such peers as e-mail, the World Wide Web, e-commerce, Voice over IP, digital streaming services, and the like?

We begin by comparing social media with earlier online communication paradigms. The social media communication model moves beyond earlier rectified asymmetrical e-mail/text messaging by being designed to be 1) a media-rich, mixed reality environment; 2) trivially scalable from individuals and memberships to dynamically created, autonomous groups of arbitrary sizes; and 3) an infrastructure that replicates, or at least approximates, in-person group dynamics. As a communication model, social media is transformative. It doesn't just extend earlier communication protocols, it moves communication

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EDITOR **HAL BERGHEL**
University of Nevada, Las Vegas; hlb@computer.org

into the realm of immersive experience. This transformation should have been perceived by society as an omen and immediate cause for concern for society had no prior experience with online immersion. As a result, society was once again caught off guard by the velocity of a new technology. Of course, society has always had to deal with disrupting technologies, such as the firearm, printing press, telephony, horseless carriages, televisions, transistors, digital imagery, and the cloud, to name but a few. But our experience with social media is a unique fusion of ubiquity and velocity. Prior to the current millennium, the issue of whether an online, immersive technology would be a social good wasn't even understood, much less asked. There were no, and still aren't for that matter, "netiquette" standards for online immersion. Few technologists anticipated that social media would enable or exacerbate cyberbullying, social media dopamine loops, microtargeting, diminishing message content reliability in communication, the rapid acceleration of disinformation, etc. Social science was providing clues, but they were ignored.

Finally, we note that the scalability of social media is baked into the design of the platforms. While this impressive capability is widely appreciated by users, it has been underappreciated by social scientists and scholars. While broadcasting is an inherent feature of social media, just as it is with television and radio, so was narrowcasting (for example, microtargeting). From the messenger's point of view, this scalability is completely transparent: the message initiator can use the same social media tools to spam the world that it uses to microtarget potential terrorists, sovereign citizens, and cyberbullying victims. This versatility is unique in human experience and largely overlooked.

Thus, the versatility of social media allows it to naturally support the dynamic maintenance of associations, use tailored messaging to appeal to special interest groups of all sizes with ease, and work with media from any and all digital content providers effortlessly. Whether the goal is to reunite with old friends, satisfy personal vanity, seek immediate gratification, settle old scores, vent hostility, harass, dox, terrorize, cultivate in-group outrage, promote conspiracy theories, or organize insurrections, social media has proven to be an ideal platform. And social media can offer minimal or no social stigma if identity is obscured. Virtual exchanges, unlike their veridical counterparts, do not provide a social buffering that discourages intemperate or toxic exchanges; social and cultural norms are relaxed, and normal interpersonal and social filters are held in in suspension. Social media was by design an ideal outlet for psychopathy and antisocial behavior. How could anyone anticipate a problem?

SOCIAL MEDIA AS A MOCK REALITY PSYCHOLOGY STUDY

Perhaps the most famous exemplar of mock reality psychology studies is the Milgram experiment conducted at Yale in the early 1960s.[3] This study was an attempt to measure the willingness of participants to blindly follow the instructions of authority figures, even when the instructions involved potential acts of harm to human subjects. It was a social scientific study that seem to quantify what Hannah Arendt described as the banality of evil.[4] The Milgram experiment confirmed that exceedingly hostile, inhumane, and antisocial behavior lies in the shadows of a great deal of social interaction and may surface in a variety of rather mundane personal characteristics such as the willful obedience to authority. Both Arendt and Milgram felt that the assumption that horrific acts are the result of psychological pathologies like psychopathy and sociopathy may well be misguided. Horrific acts may follow from far more mundane characteristics. Although simplistic, this overview recognizes the potential of moral agency in human action, that is, the contribution of social environment and structure in circumscribing what individuals consider acceptable behavior.

The Stanford prison experiment (SPE) also sought to measure the effects of situational and contextual variables on human behavior.[5,6] The SPE used university students to study the effects of situational variables on participants in a simulated prison environment. Some students were assigned the role of guards, others prisoners. The resulting hostile and sometimes brutal behavior observed caused the experiment to be terminated early and led to increased scrutiny over ethical guidelines for experiments involving human subjects. There is no shortage of commentary about this study,[7,8] including a film made in 2015.[9]

My thesis is that there is much to be learned from such mock reality psychology experiments in relation to our experience with social media.

The Milgram and SPE studies reveal a close connection between social context and abusive behavior. Hannah Arendt said as much in her book on Adolf Eichmann,[4] where she observed that when the Nazi Holocaust is understood in a broader, societal perspective, it suggests that situational contexts are sometimes powerful enough to induce apparently normal, stable individuals to engage in abnormal, immoral, or criminal conduct. An interesting spin on this was provided in an experiment by Carnahan and McFarland[10] that showed that self-selection played a

critical role in the resulting behaviors. To quote the authors,

> "Volunteers for the prison study scored significantly higher on measures of the abuse-related dispositions of aggressiveness, authoritarianism, Machiavellianism, narcissism, and social dominance and lower on empathy and altruism, two qualities inversely related to aggressive abuse. Although implications for the SPE remain a matter of conjecture, an interpretation in terms of person-situation interactionism rather than a strict situationist account is indicated by these findings."

Their argument is cogent and, it seems to me, well grounded. In both the Milgram study and the SPE, the participants volunteered to participate in the study. While the impact of self-selection on human experiments may be difficult to quantify, it is real nonetheless. That participants of experiments are accompanied by their personal tendencies, dispositions, attitudes, beliefs, and the like is beyond doubt. However, the degree to which these personality characteristics influence the outcomes of experiments is at best incompletely known. Carnahan and McFarland's study demonstrates that the absence of random selection exaggerates negative potential effects. Their claim that individuals would be unlikely to volunteer to participate in experimental environments that were likely to produce situations discordant with their personalities seems incontrovertible.

Carnahan and McFarland set up an experimental replication of the SPE that enabled them to estimate the effects of such psychological traits as agreeableness, openness to experience, dispositional sympathy and empathy, sensation seeking, codependence, altruism, and even monetary incentives on a subject's propensity toward volunteerism for two different environments. They then tested for the research traits of the volunteers in order to determine whether there were statistically significant differences between the "prison life" and control volunteer groups. The authors concluded that[10]

> "...volunteers who responded to a newspaper ad to participate in a psychological study of prison life ... were significantly higher on measures of aggressiveness, authoritarianism, Machiavellianism, narcissism, and social dominance than those who responded to a parallel ad that omitted the words of prison life, and they were significantly lower in dispositional empathy and altruism."

This research strongly suggests that self-selection may well have significantly influenced the outcomes of experiments like those of Milgram and the SPE. This certainly accords with our intuitions and is consistent with Hannah Arendt's belief that alleged "true believers" like Adolf Eichmann may have been as significantly motivated by psychological tendencies and moral disengagement as they were by Nazi ideology, racism, and antisemitism. Although the proposition that random selection of participants would minimize the effects of social bias was not a working hypothesis of the Carnahan and McFarland study, it certainly seems plausible. While scholarship like that mentioned above does not speak directly to the pitfalls of the zealous attachment to social media, the study of the effects of self-selection and voluntary participation is directly relevant. We emphasize that self-selection is at the core of the design of social media. There is no random selection in selecting Facebook friends, following Instagram hashtags, or the lineup for tweets. Self-selection exposes similar attendant risks in social media to those in the Milgram and SPE studies. Self-selection amplifies the risk of antisocial, abnormal behavior by isolating groups from social and cultural norms for acceptable behavior.

SOCIAL MEDIA AS A SOCIAL STRESSOR

Moving beyond technology design to consequences, we are able to identify a cornucopia of social tensions that result from the use of social media. In his recent book, *Ten Arguments for Deleting Your Social Media Accounts Right Now*,[11] computer scientist and technologist Jaron Lanier performs yeoman's duty in exposing the antisocial consequences of the technology:

> "Social media-inflected jihadists and white supremacists are the people who respond most to the way algorithms seek engagement and influence. The algorithms invoke fight-or-flight emotions and play on infantile needs for attention."

He is alluding to the effects of self-selection discussed above by suggesting that social media platforms tend to bring out the worst behavior in some people, for example, cyberbullying and shaming, online harassment and character assassination, doxing, and trolling, not to mention deadening personal interaction and perverting politics.[12] That criticism certainly seems to fit. But it would be a mistake not to identify possible parallels with 911-swatting, spamming, ransomware, digital fraud, online hate groups, conspiracy theory websites, and the use of Internet resources to promulgate disinformation![13,14] Regrettably, legitimate criticisms of social media are largely ignored by large segments of the public because of the perceived appeal of social media. But we ignore these criticisms at our own peril because of the potential existential threats that social media platforms may produce for society. In addition to being a mock psychology testbed, it must be admitted that social media is a global, unsupervised experiment in naïve crowd psychology.[15]

Here are some specific causes of social media stress.

Social media is distinctively Pavlovian

Even modest reflection reveals the Pavlovian nature of our social media experience. As Lanier put it, "everyone who is on social media is getting individualized, continuously adjusted stimuli." He likens social media to an online Skinner box but controlled by corporate interests rather than scientific oversight. Think of this as behavioral modification, where users are the guinea pigs in some mad scientists' online experimental cage. Algorithm-driven, adaptive social media relies on positive and negative reinforcement in the same way that Skinner used it in his namesake box: the way you manipulate online subjects to do what a developers want is by feeding them positive stimuli and vice versa. And we cannot overestimate the effects of negative reinforcement: cyberbullying, pretexting and catfishing, belittlement, harassment, and the like have become staples of social media that play upon social anxieties of defenseless victims. In Lanier's words, "...social media amplifies negative emotions more than positive ones, so it's more efficient at harming society than at improving it: creepier customers get more bang for their buck."

The "lock-in" network effect is the pandemic of social media

"Lock-in" is the term used in the networking community to denote an environment where there are strong disincentives to stop or switch services. Lock-ins have a similar effect to that of frequent-traveler programs but use a reverse psychology. Instead of offering premiums, lock-ins provide disincentives subtly through "fear of missing out" (FOMO). Experience with "lock-ins" confirms the potential efficacy of disincentives. In this case, FOMO imitates addiction.

FOMO-based enticement leads to disincentive-based monopolies, another relatively unique characteristic of social media. Platform design specifically excludes wiggle room for shared loyalties: you're either in or out. Because of the considerable peer pressure to remain locked in to the platform shared by the "in crowd," continued association results from a kind of cognitive blackmail that subverts individuality and free will in some people. Lanier observed that "there isn't a real choice to move to different social media accounts. Quitting entirely is the only option for change." Well put.

Social media is behavior modification on steroids

Three time-honored adages apply to the understanding of commercial social media platforms:

1. If you want to find a motive, follow the money.
2. There's no such thing as a free lunch.
3. If you use social media, you're not a customer, you're the product.

Social media is neither "free" nor beneficent. Platform owners/executives are beholden to their customers, and their customers are the organizations that pay them. Social media platforms receive money from advertisers who want to modify the purchasing behavior of users. But they also receive money from marketers that resell or repurpose user information to other organizations for second-order manipulation (for example, microtargeting). But, and this is the important point, they do not receive money from users. The users offer up changes in their behavior in exchange for the opportunity to use the service. Behavior modification is the commodity, and users are in a very real sense the product. This is the business model of social media.

But there is also a more subtle, noncommercial form of behavioral modification: the modification of user behavior by other users, including modifying behavior through reactions to posts, attracting new followers/subscribers, changing attitudes, supporting causes, stimulating others to action, etc. So, while the primary behavior modification market is the economic part of the business plan, there is also a secondary, noneconomic behavior modification "aftermarket" that enhances the primary market and creates additional perverse incentives for the participants. Some platform users are willing to participate in the primary market in order to have the opportunity to influence the behavior of other platform users in the secondary market. Perhaps a better way to think of a social media model is as a multitiered behavior modification environment, where the higher tiers are based on economic manipulation and the lower tiers are based on psychosocial manipulation. In any event, social media is all about behavioral modification in one form or another.

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The social media ecosystem seems ideal for galvanizing social outliers

Let's suppose that you want to organize some significant social disruption, for example, an insurrection, terrorist attack, assassination, coup, etc. You estimate that there are hundreds of potentially willing coconspirators, but you

don't know who they are, where they are located, or how to reach them. How would you design a system to communicate with them and get them to join your cause? Specifically, what characteristics should the system have?

First, we have to rule out using mass media for there is no reason to assume that the reach will extend to many members of the miniscule target audience, and mass media is certain to draw unwanted attention to the illegal/antisocial cause. The optimal approach should be both granular (narrowcasting rather than broadcasting) and tribal (high probability of reaching individuals with shared objectives and dispositions). But how are we to individuate members of this imagined tribe? The solution is to rely on the same self-selection that we observed in the mock psychology experiments.

Our observations call for the use of a communication platform that has characteristics like these:

1. *Unique messaging capability (aka microtargeting) so that we can appeal directly to potential recruits who share our enthusiasm for mischief*: The Cambridge Analytica scandal provides an illustration of how this might be done.[16] We want fellow travelers, not a herd.
2. *Geographical transparency*: Our narrow audience is very unlikely to be located in one place and for a variety of reasons is hard to find.[13]
3. *Interactive, bidirectional, multimedia capable, and participatory*: Memes, deepfakery, video streaming, generative AI bloviation, and an entire suite of disinformation-rich resources will all be required to fire the base.[15]
4. *Support idea-reinforcing "thought swarms"*: Insurrection, terrorism, political coups, and assassinations, not to mention election fraud, treason, major criminal activities, blackmail and extortion, etc., will necessarily depend upon continuous belief and motive reinforcement. The more untenable the goal and the greater the personal risk, the greater the required gestation period to bring everyone on board. To put it bluntly, if you're facing life imprisonment for your involvement, you'll want to feel confident that the insurrection has a measurable chance of success before joining in.
5. *Continuous availability*: Finally, our platform must be continuously available to the entire target audience. Today, that means being connected to the Internet.

Characteristics 1–5 seem worthy characteristics for our ideal communication platform. What comes to mind?

Social media and the Five Ds of sociopathy

Social media is also an ideal communication environment for what I'll call the five Ds of sociopathy: disinformation, deception, dishonesty, delusion, and duplicity. The transaction friction for cultivating and distributing deception, lies, disinformation, fake news, posttruths, etc., is virtually nil. Goals of unbridled self-promotion, dissemination of fake news (in the journalist's, not the politician's, sense of the term), conspiracy theories, scams and misrepresentations, libel, slander, and solicitations for participation in illegal acts are easily accommodated by social media, especially when the perpetrator hides behind a cloak of anonymity through rogue accounts. Social media, along with other unvetted online media sources, is epistemically vacuous. There is no fact-checking, vetting, or counterbalancing of communication because there is no accountability.

The precursors of modern social media were largely envisioned in the last quarter of the 20th century as enabling technologies for online engagement that might be used for dynamic, interactive, and participatory environments, independent of bias, social stigma, and class distinctions. It was hoped that this would a great leap forward for equal opportunity, certainly an admirable goal. But technologists were focused on only the positive potential of enriching online experiences, through such things as video conferencing, idea-sharing, collaboratories, computer-assisted cooperative work, and anonymous engagement, and not on potential misuse. But even then, some scholars recognized potential downsides such as intellectual distraction, loss of privacy, subversion of intellectual property regulation, and a resulting intensity loss in terms of the quality of interpersonal interaction, but they were largely drowned out by the enthusiasm. History has shown that while many of these fears were justified, they were also too narrow. Ironically, history has also shown that many of these social ills were anticipated by George Orwell[17] and Aldous Huxley[18] nearly a century ago. But that's another story.

More to the point, absent any significant experience with the use of online technology to facilitate social engagement and democratize social organization, technologists were caught up in the euphoria of innovation and forged ahead at full speed. To put this online innovation in context, it should be remembered that in 1990 the e-mail protocols SMTP, POP, and IMAP were less than a decade old; the World Wide Web was still in development; Amazon.com had yet to be created; and Gmail and Facebook were 15 years in the future. Hindsight may be accurate, but it isn't always that informative when decontextualized. It simply never occurred to most technologists that social media platforms would be weaponized to subvert democracy, spread disinformation, and foment hate. This is just another corollary to Langdon Winner's observation that technologies may take on unethical and antisocial qualities that go unnoticed

by the developers. Winner's thesis that that society's concern should not be limited to the ethical intent of technology, but also the full range of potential effects, is unassailable.[19] The fact that very few could anticipate that social media would become an ideal platform for nurturing motivated reasoning and reinforcing cognitive dissonance speaks volumes about deficiencies in research methods.

In this analysis of social media as a technology platform, we noted that there were many indicators of attendant societal risks of computing and networking technologies that were left unattended. Society was (and remains) ill prepared for the velocity and revolutionary nature of some of the most cutting edge technologies. It is not widely acknowledged that a technology does not have to be implemented in bad faith to have negative consequences for society. All too often we allow cognitive bias to distort our assessment of technology innovation and withhold criticism until it becomes demonstrably irrational. Consider that perceived useful innovations like leaded gasoline, chlorofluorocarbons, DDT, asbestos, styrofoam, nuclear fission, hydrogenated oils, and tobacco products all continued to be widely endorsed long after negative consequences were scientifically documented.[20] Of course, this innovation tenacity derives from both an attachment to perceived practical advantage and also a refusal to accept reality. It is this latter cognitive bias that is hardest to predict and explain and is related to the earlier rush to innovation without much reflection.

So the existential threat that social media has produced is not without precedence, but it has few technology rivals in terms of rapidity and ubiquity; the one possible exception would be another epistemic bridge to nowhere, generative AI. Over the past half century we seem to be racing toward an age of unenlightenment, not dissimilar to the dystopias predicted by Orwell and Huxley, who both predicted consequences of catering to the most base, artless, and unsophisticated of human drives, for example, self-importance, instant gratification, unconditional belief reinforcement, revenge, epistemological relativism, acceptance of antisocial ideas, antiscience, and, most of all, the defense of willful ignorance as an unalienable right. In the end the cause of our crisis is hydra-headed along the lines discussed above.

We conclude with a quote from Jaron Lanier: "Social media is biased, not the Left or the Right, but downward." C

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HAL BERGHEL is a professor of computer science at the University of Nevada, Las Vegas, Las Vegas, NV 89154 USA. Contact him at hlb@computer.org.

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