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Is the Attention Economy Noxious?

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1. Introduction

A growing amount of media is paid for by its consumers through their very consumption of it. This new media is highly interactive and requires some form of computing for its operation (Logan, 2010). Examples include the services offered by Facebook, Instagram, Snapchat, and YouTube. As these examples suggest, much new media is funded primarily through advertising, which has been optimized using Big Data.

New media differs from more traditional forms of media in its ability to absorb and respond to information about consumers in real time. Compare, for instance, broadcast television with YouTube. People living in the same geographical area are offered roughly similar experiences of broadcast television: they are offered the same channels in the same order, and when they turn to the same channel, they see the same content and the same advertisements. When people living in the same geographical area log on to YouTube, by contrast, it is not at all likely that they will be offered the same content. Indeed, it is not at all likely that people living under the same roof will be offered the same content if they visit the site separately. This is because the site opens to a handful of videos carefully tailored to what YouTube thinks the current user might be interested in at that time. If two users watch the same video on separate devices, they will very likely see different advertisements (which will have been tailored to what YouTube thinks the users might be interested in). At the end of that first video, YouTube will queue up a video to play next. Here, too, different users will receive different recommendations, despite having just watched the same video. Part of this high degree of customization is possible because YouTube — like many new media services — doubles as a social networking site.[1] In the case of YouTube, this allows users to create

1. Where a *social networking site* is a "web-based service[] that allow[s] individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system"(boyd and Ellison, 2007, p. 211).

profiles, "friend" each other, and track mentions of their profiles, all of which bolsters the site's ability to capture user attention.

The attention economy, the economic market in new media services, is constituted by two types of transactions: those in which consumers give new media developers their literal attention in exchange for a service (such as a news feed or access to pictures of friends), and those in which developers auction off consumer attention to advertisers.

The morally salient features of this market have not yet been fully appreciated. A growing body of research shows that new media contributes to anxiety, depression, feelings of loneliness, self-harm, and suicide (Twenge, 2017). These technologies also contribute to polarization, balkanization, and extremism (Sunstein [2017]; Alfano et al. [2018]; Nguyen [*forthcoming*]). Further, new media is extremely addictive by design. Popular design guides for building smartphone applications, such as Nir Eyal's *Hooked*, offer developers evidence-based tactics for manufacturing addiction to products, via the exploitation of cognitive biases (such as the fear of missing out, social comparison, status quo bias, framing effects, and anchoring effects [Williams, 2018]). New media companies are built on a business model that goes back to the 1830s, when *The New York Sun* decided to rely on advertising sold to its large readership as its main source of revenue (Postman, 1993; Wu, 2016), and these companies will still go to any length to capture our attention. Google's AlphaGo has put been put to work at generating YouTube recommendations (Rowan, 2015). As James Williams puts it, this means that "the same intelligence behind the system that defeated the human world champion at the game Go is sitting on the other side of your screen and showing you videos that it thinks will keep you using YouTube for as long as possible" (Williams, 2018 p. 90).

In light of these considerations, we think that there is good reason to ask whether we should tolerate the attention economy in its current form. We explore this question by deploying a framework inspired by Debra Satz (2010), who has offered an analysis of what makes a market in a particular good *noxious* — that is, what makes that market "toxic to important human values" (Satz, 2010, p. 3). We conclude that the attention economy is noxious, and we use our assessment to motivate a certain sort of regulatory response.

2. The Framework

Those who defend "the market" typically do so in terms of two favorable characteristics that it is thought to possess: optimality and freedom. Markets are thought to promote optimality in the sense that conditions of long-run perfect competition among market actors tend to lead to a Pareto-optimal distribution of resources.[2] Markets are thought to promote freedom, in the sense that they allow individuals to act autonomously and voluntarily. The two favorable characteristics of markets, in turn, suggest two ethical criteria against which a market in a particular good can be criticized: a criterion related to the market's harmful effects, and a criterion related to its disrespect to agency.

The first of these criteria, the *harm criterion*, relates to whether the market tends to engender harmful outcomes. Following Satz (2010), we will concern ourselves with two kinds of harms. One kind of harm involves extremely harmful outcomes for *individuals*. As Satz observes, we can identify a minimum level of well-being that we cannot tolerate individuals falling below. Yet there is nothing that rules out the possibility of a market producing destitution; markets can be economically efficient yet morally problematic.

Another kind of harm involves harmful outcomes for *society as a whole*. If a particular market somehow harms the institutions that are needed for individuals to engage effectively in democracy, then the market — regardless of whether it is efficient — might be morally problematic. This explains, for example, why we should not tolerate a market in votes, even if such a market turns out to be Pareto-optimal.

The second of the two ethical criteria, the *agency criterion*, relates not to the outcomes of the market, but rather to whether it somehow reflects weakened agency. One facet of the agency criterion involves *weakened cognitive agency*: ways in which market participants fail to

2. A situation is *Pareto-optimal* iff no one's position in it can be improved without reducing the position of someone else.

instantiate the characteristics of an ideally rational actor. To be sure, no one can fully live up to such ideals. But our distance from them is, in some cases, of moral significance, such as when particularly irrational or incontinent market actors (such a young children or addicts) are incorrectly assumed to be autonomous choosers, and thus are wrongly regarded to be bound by and held responsible for their choices.

The other facet of the agency criterion is concerned with the exploitation of people's *vulnerabilities*: their urgent and nonnegotiable needs. Possessing a vulnerability of this sort undermines one's standing to bargain. Markets that are characterized by such vulnerabilities are a source of concern because agents' choices under those conditions fail to be voluntary. An example is sweatshop labor in the developing world.

So, there are four dimensions by which markets can be evaluated: *harms to individuals*, *harms to society*, and the market's reflecting or engendering *weakened cognitive agency* and *vulnerability*. Satz notes that high enough marks in any one of these dimensions can make a market noxious (Satz, 2010 p. 98). In what follows, we show that the attention economy scores highly across all four.

3. The Evaluation

3.1 The Harm Criterion

The attention economy is a source of extreme harm, both to individuals and to society as a whole. In 3.1.1 and 3.1.2, we will discuss each of the two sources of harm in turn.

3.1.1 Harms to Individuals

Consumption of new media causes anxiety, depression, feelings of loneliness, self-harm, and suicide (Twenge, 2017), and the attention economy is implicated in these concerns.

Jean Twenge offers a careful analysis of these causal connections, using data from four databases: Monitoring the Future (MtF),[3] the Youth Risk Behavior Surveillance System (YRBSS),[4] the American Freshman (AF) survey,[5] and the General Society Survey (GSS).[6] Following her argumentative strategy, we will argue for these connections by first establishing correlations between new media consumption and these negative mental health outcomes. We will then show that major spikes in incidences of these negative outcomes coincided with the widespread adoption of smartphone technology (the main channel of new media consumption). Along the way, we will cite a few trial studies that serve as an independent source of evidence for our causal claims.

Twenge's data paints a clear picture of the correlation between new media consumption and poor mental health outcomes. Her analysis of the MtF database revealed that consumption of social media was associated with high relative risks[7] of unhappiness (greater than 50%), loneliness (greater than 10%), and high depressive symptoms[8] (greater than 25%) (Twenge, 2017, pp. 78–82). It is worth noting here that many activities (and, in fact, all in-person activities) exhibited negative correlations with negative mental health outcomes; the most dramatic (and perhaps least surprising) comparison is with sports and exercise, which *decreased* unhappiness, loneliness, and high depressive symptoms by greater than 35%, 25%, and 40% (respectively). Twenge's analysis of the YRBSS revealed that teens who spend 3 hours a day or more on electronic devices are 35% more likely to have a suicide risk factor.[9] The MtF database revealed that high school seniors spent an

3. MtF has asked high school seniors more than 1,000 questions per year since 1976, and 8th and 10th graders since 1991 (Twenge, 2017).

4. YRBSS is a Center for Disease Control and Prevention initiative that has surveyed high school students since 1991 (Twenge, 2017).

5. AF is a Higher Education Research Institute initiative that has surveyed college freshmen since 1966 (Twenge, 2017).

6. GSS has surveyed adults since 1972 (Twenge, 2017).

7. A *relative risk* is the increased (or decreased) chance of one thing happening given another thing (Twenge, 2017, Appendix A).

8. Defined as agreeing with 'I feel like I can't do anything right', 'My life is not useful', or 'I do not enjoy life.'

9. A suicide risk factor is a "yes" answer to any of the following: "feeling very sad and hopeless for two weeks", "seriously considering committing suicide",

average of 2 ½ hours a day texting, 2 hours a day on the Internet, 1 ½ hours a day on electronic gaming, and a half hour on video chat — a total of 6 hours per day on new media (Twenge, 2017, p. 51).

In response to the above correlations, it is natural to ask which way the causal arrow runs: Does new media consumption make people lonely, unhappy, and depressed; or does being lonely, unhappy, and depressed make people consume new media? The following three trials are suggestive of the former. Tromholt (2016) assigned randomly chosen participants the task of quitting Facebook for a week. The treatment group showed significant increases in life satisfaction, positive emotions, satisfaction with their social life, and ability to concentrate; they also showed significant decreases in negative emotions and were 55% less likely to feel stressed. Kross et al. (2013) text-messaged college students five times a day to examine how Facebook influenced how they felt moment-to-moment and how it affected their life satisfaction; they found that Facebook use predicted decline in both factors. They also found that declines in these factors did not predict Facebook use. Shakya and Christakis (2017) analyzed three years of nationally representative data from the Gallup Panel Social Network Study and found similar trends amongst adults. This study also noted that not only does social media use negatively affect well-being, but it also detracts from activities that increase well-being, such as face-to-face interactions. This suggests that the direct negative effects of new media are compounded by an indirect effect: it takes us away from activities that have a positive influence on our well-being.

As a final piece of evidence for the claim that new media causes mental health problems, consider the following: Right around 2011, there began an unprecedented spike in mental health problems among teens and college students, a trend that has continued to the present (Twenge, 2017). In 2011, for example, we see loneliness in the MtF (which surveys teens) rise to unprecedented rates. Around the same time, the MtF reveals an upward trend in depressive symptoms. The AF shows a similar pattern in college students. As of 2016, *all* indicators of mental health problems hit all-time highs, with 95% reporting that they feel depressed. According to the National Survey on Drug Use and Health (NSDUH), a national in-person survey of more than 17,000 teens that was conducted by the Department of Health and Human Services from 2004 to 2015, these spikes in mental health problems have been accompanied by spikes diagnosable depression and suicide. In 2015 the survey reported that diagnosable depression in teens had increased by 56% since 2010 (Twenge, 2017, p. 108). This coincided with a surge in national suicide rates, which hit a 30-year high in 2016 (Tavernise, 2016).

The sharp rise in these distressing numbers coincided almost exactly with the time that smartphones became ubiquitous (and, as a result, in-person interaction measurably dropped) (Twenge, 2017, p. 104). This correlation alone does not suggest that new media caused the tidal wave of mental health problems that are reflected in the AF, MtF, GSS, and YRBSS. However, the timing, when conjoined with the correlational and trial data, does suggest that new media causes negative mental health outcomes, a serious harm to individuals.

In light of this discussion, it is tempting to think that new media consumption in general is associated with negative mental health outcomes for all populations. However, this generalization may not be true. Twenge's databases track 8th- and 10th-graders, high school students, college freshmen, and adults. They do not, however, track older adults specifically, and there is some reason to think that social media in fact benefits this population. For example, Hutto et al. (2015) found, among older adults, a negative correlation between high frequency of social media use and perceived loneliness and a positive correlation between social media use and satisfaction with one's social role. These findings are intuitive. Social media allows older adults, whose "real" (as opposed to online) social networks shrink over time (Cornwell et al., 2008), to augment their communications with family and friends. Further, as Anja Leist (2013) notes, older adults come to social media with more stable self-concepts and relationships than their younger

"making a plan to commit suicide", or "having attempted to commit suicide" (Twenge, 2017, p. 83).

counterparts, which may protect them from at least some of the ill effects of social media.

3.1.2 Social-Level Harms

The attention economy is not only a driver of extreme harms to particular individuals; it is also a driver of significant harms to society as a whole. In addition to whatever the social-level effects of the surge in mental health issues ushered in by new media might be, new media harms society by contributing to political polarization, balkanization, and extremism (Sunstein, 2017).

New media contributes to these odious outcomes by offering niche, customized information channels and by allowing consumers with niche interests to find each other with ease. As Van Alstyne and Brynjolfsson (2005) put it:

> Because the Internet makes it easier to find like-minded individuals, it can facilitate the creation and strength of fringe communities that have a common ideology but are dispersed geographically. Thus, particle physicists, oenophiles, *Star Trek* fans, and members of militia groups have used the Internet to find each other, swap information and stoke each others' passions. In many cases, their heated dialogues might never have reached critical mass as long as geographic separation diluted them to a few participants per million (Van Alstyne and Brynjolfsson, 2005, p. 3).

Because new media thrives on attention, it makes finding like-minded individuals easy (think, for example, of the hashtag).

The kind of ideological sorting that this enables is an engine for extremism. Consider, for example, the role that social media has played in the radicalization of the perpetrators of recent acts of lone-wolf terrorism, such as the 2019 Christchurch shooting (where some 50 people were murdered at two mosques in Christchurch, New Zealand). The Christchurch shooter was a denizen of 8chan, a social media site that prides itself on being a space for free expression. Indeed, he announced his plans on the site before the mass murder (Stewart, 2019). 8chan's stance on freedom of expression has made it, in the words of technology journalist Emily Stewart, "a space where reprehensible ideas not only survive, but flourish, and extremists gather to share their views and egg each other on" (Stewart, 2019).

The Christchurch shooter is not the only white nationalist, lone-wolf terrorist associated with the site.[10] Six weeks after the Christchurch shooting, the 2019 Poway shooting occurred (where one person was murdered at the Poway synagogue in San Diego, California). The Poway shooter posted a manifesto on 8chan, stating, "I've only been lurking [on 8chan] for a year and a half, yet what I've learned here is priceless. It's been an honor" (Stewart, 2019). The first response to the post was another user telling the shooter to "get a high score" — that is, to kill a lot of people (Stewart, 2019).

Niche information channels are also engines for polarization. Consider, for example, Schkade et al. (2007), where groups of liberals and groups of conservatives were asked to discuss issues such as same-sex marriage, affirmative action, and global warming. In almost every group studied, group members left the discussion with more extreme views than they had before. Liberals' support of measures to mitigate global warming, affirmative action, and same-sex marriage grew, as did conservatives' opposition (Schkade et al., 2007). These sorts of

10. Nor, sadly, are these the only examples of those who became terrorists through *online self-radicalization*, the adoption of extreme convictions through self-directed engagement with the Internet. Among many others, Jose Pimentel (who was arrested in 2011 for building homemade pipe bombs targeted at veterans of the Iraq and Afghanistan wars), Tamerlan and Dzhokhar Tsarnaev (perpetrators of the 2013 Boston Marathon bombing), Dylann Roof (perpetrator of the 2015 Charleston church mass shooting), Omar Mateen (perpetrator of the 2016 Pulse night club shooting), and Alek Minassian (perpetrator of the 2018 Toronto van attack) are the products of online self-radicalization (Alfano et al. [2018]). For illuminating discussions of the mechanisms that drive online self-radicalization, see Alfano et al. (2018) and Nguyen (*forthcoming*).

results have been reproduced dozens of times, in experiments the world over (Sunstein, 2017).[11]

In addition to whatever damage it does to democracy via its contribution to polarization, new media also undermines democracy by eroding the shared basis of experiences needed for deliberative democracy. As Eli Pariser writes, "Democracy requires citizens to see things from another's point of view, but instead we're more and more enclosed in our own bubbles" (Pariser, 2011, p. 5). Insofar as new media encourages the development of epistemic bubbles and echo chambers in the pursuit of attention capture, it is at odds with our democratic ideals. Certainly, Facebook has ambitions of wholesale personalization of the Internet: in 2010, Facebook's Chief Operating Officer Sheryl Sandberg said the idea of a website that isn't customized to a particular user will soon seem quaint (Kirkpatrick, 2010).

Indeed, personalization has spread across the web: Facebook's News Feed, a major source of news for many Americans (Shearer and Gottfried, 2017), is tailored to show users what the site's algorithm thinks they most want to see. Web browsers, such as Google Chrome, interface with sites like YouTube to curate video suggestions. Search engines, such as Google, now personalize results such that different users will see different results when they enter the same search terms (Pariser, 2011, p. 2). This means that many a user now has a highly personalized information diet, and thus lives in what Pariser calls a "filter bubble". These filter bubbles can be global in scope: for example, on Google Maps UK, the Crimean Peninsula is drawn as a disputed territory; on Ukrainian Google Maps, the territory is included as part of Ukraine; and on Google Maps Russia, it is included as part of Russia. With the growth of such radical personalization, filter bubbles have become difficult, if not impossible, to escape.

It is worth pausing here to note some similarities and differences between the niche information channels of new media and those of another, older form of media that is prone to offering consumers free, niche information channels: talk radio.

Political commentary on the radio ascended in the late 1980s and early 1990s with the 1987 fall of the fairness doctrine (Berry and Sobieraj, 2016). These new political commentary shows, such as *The Rush Limbaugh Show*, were characteristically *reactive* (responding to news as opposed to breaking it), *ideologically selective* (rather than addressing all major political developments, addressing only those which are compelling from a particular ideological vantage point), *engaging* (more entertaining than conventional commentary), and *internally intertextual* (making many references to other hosts or shows in the genre) (Berry and Sobieraj, 2016). These characteristics — which are interconnected: ideological selectivity contributes to engagement and so forth — created a sense of community around these shows. In the case of certain shows, this served the important purpose of increasing the perceived credibility of some actors (the host, the listeners, hosts of ally shows, etc.) and discrediting others (persons the host disproves of, non-listeners, hosts of enemy shows, etc.), thus forming an echo chamber (cf. Nguyen, [*forthcoming*]).

This reactive, ideologically selective, engaging, internally intertextual content is characteristic of talk radio and new media. This is no doubt because new media and talk radio have in common the funding model pioneered by *The New York Sun* (i.e., relying on advertising instead of subscription for revenue), and this kind of content effectively attracts a loyal base to be advertised to. Indeed, this funding model is commonly thought to be why certain sites, such as YouTube, are biased towards extreme content (see, for example, Lewis [2018]). As Guillaume Chaslot, a former YouTube engineer, put it, "YouTube is something that looks like reality, but it is distorted to make you spend more time online. […] The recommendation algorithm is not optimising for what is truthful, or balanced, or healthy for democracy" (Lewis, 2018). Reflecting on his time at YouTube, Chaslot stated, "Watch time was the priority. […] Everything else was considered a distraction" (Lewis, 2018).

11. See, for example, Brown (2003), Zuber et al. (1992), Abrams et al. (1990), Myers (1975), and Sunstein et al. (2006).

Despite their similarities, the niche information channels of new media are, in certain respects, more pernicious than those of talk radio.

One reason is that it is fairly easy to disengage from talk radio. To disengage, all a listener needs to do is turn the radio off. New media is not so easy to escape. This is for several reasons. One reason is that most new media applications send notifications to users' smartphones, alerting them of content that they may be interested in (e.g., someone's response to one of their posts). Smartphones, unlike radios, are not so easily turned off. As we will discuss in the next section, smartphone users are quite attached to their devices. Further, these devices often double as work computers, so many users mustn't turn them off. Another reason has to do with the inter- and intra-connectivity of new media sites and applications. When a listener turns a conventional radio off or switches stations, other radio stations, T.V. channels, or similarly interested parties do not know what the listener was just listening to. In contrast, when a user leaves a site or application, it is often known by other sites, applications, or interested parties what the user has just done, and thus what to suggest, display, and advertise to them. This can also happen within a site. If a user watches some video from one YouTube channel and then turns to some other kind of content, they may receive suggestions based on their activity on the previous channel. Their advertising experience may also bear the thumbprint of their prior activity. Note here that the inter- and intra-connectivity of new media can make the filter bubbles that encapsulate us exceptionally difficult to escape. This simply could not happen with conventional radios.

Another important difference between new media's niche information channels and their predecessors is the level of interactivity and thus engagement that they afford consumers. Social media sites in particular are rife with emotionally charged exchanges among users. These kinds of exchanges are difficult for participants (as well as onlookers) to disengage from, because they involve *their* ideas and *their* identity. To be sure, talk radio sometimes features callers who can experience the same kind of personal engagement with an issue, host, or other caller. But because of its emphasis on interactivity, new media offers each of us this affordance, marking a very big difference in degree of engagement between the two mediums.

3.2 The Agency Criterion

The attention economy also involves elements of weakened cognitive agency and vulnerability. In 3.2.1, we discuss the aspects of weakened agency it reflects, and in 3.2.2, we discuss the vulnerabilities it exploits.

3.2.1 Weakened Cognitive Agency

Nir Eyal's best-selling design guide for smartphone applications *Hooked: How to Build Habit-Forming Products* begins with some statistics: 79% of smartphone owners check their device within 15 minutes of waking up; 1/3 of Americans would rather give up sex than their phones; the average user checks their phone more than 150 times per day (Eyal, 2014, p. 2). "Face it," Eyal concludes: "We're hooked" (Eyal, 2014, p. 2).

Eyal goes on to explain that, in the attention economy, manufacturing habits[12] is "imperative for the survival of many products" (Eyal, 2014, p. 2). He explains how developers of smartphone applications can use the research of behavioral psychologists, such as Ferster and Skinner (1957), to "hook" users.

The process of manufacturing habits turns out to be quite simple. The "Hooked Model" breaks it down into four steps. First, "trigger" the user; bring their attention to the app (via, for example, a notification). Second, queue an action that will be done in the anticipation of a reward. This can be as simple as getting a user to check their messages or click on photos in their News Feed. Third, give a variable reward — that is, tie the action to outcomes that are sometimes very rewarding (perhaps a slew of "likes") and at other times mundane (perhaps *another* picture of an acquaintance's cat). This is the Hooked Model's most powerful tool. As Eyal explains:

12. Eyal defines *habits* as "automatic behaviours triggered by situational cues: things we do with little or no conscious thought" (Eyal, 2014, p. 1).

> Research shows that levels of the neurotransmitter dopamine surge when the brain is expecting reward. Although dopamine is often wrongly categorized as making us feel good, introducing variability does create a focused state, *which suppresses the areas of the brain associated with judgement and reason while activating the parts associated with wanting and desire* (Eyal, 2014, p. 7; emphasis added).

Eyal notes that this variable reward system is the same mechanism that drives "many other habit-forming products", such as "slot machines and lotteries" (Eyal, 2014, p. 7). The last step of the Hooked Model, "investment", involves having the user put something into the product, such as a new photo or post, or their contact information, and is meant to increase the chance that the user will pass through another "Hook cycle" in the future.

If one uses social media, "freemium" games, or applications for managing email and private messages, the Hook cycle will look familiar. Eyal's insight laid the blueprint for applications we are all familiar with. As Eyal admits, the Hooked Model is designed to make an end-run around our rationality. And there is no question that the model works well, even at global scale. Sean Parker, who was Facebook's first CEO, comments on Facebook's strategy:

> The thought process that went into building these applications, Facebook being the first of them, […] was all about: "How do we consume as much of your time and conscious attention as possible?" And that means that we need to sort of give you a little dopamine hit every once in a while, because someone liked or commented on a photo or a post or whatever. And that's going to get you to contribute more content, and that's going to get you […] more likes and comments. It's a social-validation feedback loop […] exactly the kind of thing that a hacker like myself would come up with, because you're exploiting a vulnerability in human psychology. The inventors, creators — it's me, it's Mark [Zuckerberg], it's Kevin Systrom on Instagram, it's all of these people — understood this consciously. And we did it anyway (Solon, 2017).

Given that the attention economy is built on a model of "exploiting a vulnerability in human psychology", as Parker puts it, the market has its source in weakened cognitive agency.

3.2.2 Vulnerability

The attention economy, finally, engenders and exploits people's vulnerabilities.

"You have to have an iPhone. It's like Apple has a monopoly on adolescence," says Billie, one of the hundreds of teenage girls Nancy Jo Sales interviewed for her book *American Girls: Social Media and the Secret Lives of Teenagers*. "It's like Apple has a monopoly on adolescence" (Sales, 2016, p. 251). Billie is right. As of 2015, two thirds of US teens owned an iPhone, and 75% planned for their next smartphone to be one (Twenge, 2017). Speaking about social media, Emily, a teen Jean Twenge interviewed for the book *iGen*, says, "Everyone uses it. It's a good way to, like, make plans with people. If you don't, you might miss out on plans that you could have gone to" (Twenge, 2017, p. 53).[13] Like Billie, Emily is right. As of 2015, 97% of 12th-graders and 98% of 12th-grade girls used social media sites, making the adoption of these platforms nearly universal (Twenge, 2017, p. 55). For many teens, engagement with new media feels — and perhaps is — mandatory.

This is not just the case for teens. Increasingly, adult new media users don't have a choice whether or not to participate in the attention economy. Business is increasingly conducted on social networking platforms such as Line, WeChat, WhatsApp, and Facebook, making engagement with them professionally mandatory (Lauria 2017).[14] Further, important social events, such as weddings, are increasingly

13. Note that Eyal (2014) recommends exploiting fear of missing out as a mechanism for "triggering" users.

14. This is true especially in Asia, where business communication via these apps is preferred to communication via phone or email (Lauria 2017).

organized on social media sites, such as Facebook, making engagement with these sites socially mandatory. These facts, combined with the ubiquity of smartphones, make new media all but impossible to avoid for many adults.

This creates vulnerabilities that do not depend on a lack of user understanding. As we noted in the last section, even apps that seem innocuous, such as those used to monitor one's email, use design principles that can be used to "hook" us. In the attention economy, services that purport to have one affordance[15] (e.g., connecting friends, checking emails) are in fact ultimately designed to keep users on the application as long or as frequently as possible, with the ultimate aim of getting the user to click on ads or buy services (such as premium features).[16] This, after all, is how such products are paid for. Were the actual affordances of new media more salient and were options to opt out of the Hooked Model available, our concerns would not apply here. However, at present, many simply can't avoid products with these design features.

Finally, it is important to note that it's not only sites like Facebook, Instagram, Snapchat, and YouTube that operate according to the Hooked Model. LinkedIn, ResearchGate, Academia.edu, and even PhilPeople also bear the hallmarks of that model. To be clear, these other platforms do not instantiate the problems we have discussed to the same degree: they are not funded primarily by third parties through advertisements, and thus do not require or motivate the same levels of engagement in their users. Yet, they still neg us and nudge us into using them and run us through Hook cycles when their triggers work. Even those of us who know that these products cause addiction and mental health problems must use them or face professional or social exclusion.

15. An *affordance* is "a relationship between the properties of an object and the capabilities of […] [an] agent that determine just how the object could possibly be used [by the agent]" (Norman, 2013, p. 11). Chairs are for sitting; thus, for most adults, such chairs afford sitting.

16. For further discussion of this issue (though not exactly in these terms), see Williams (2018).

4. Toward a Better Attention Economy

In two respects, new media is similar to cigarettes: both have been proven to be harmful and addictive. For this reason, we think the history of tobacco regulation in the United States might give us a rough model for the proper regulatory response to the issues with the attention economy that have been outlined in this paper.

By 1964, when the Surgeon General released a report outlining some of the harms involved in tobacco use, those harms were already well-known. Yet, when the first federal regulation mandating warning labels on cigarettes appeared in the United States only a year later, the new laws had an immediate and significant effect on public discourse. This law, called the Federal Cigarette Labeling and Advertising Act (FCLAA), did not aim to prohibit the market for tobacco products or even to mitigate its harms through "sin taxes". Rather, the law aimed at strengthening the agency of consumers. The political campaign that underwrote the passage of the law was highly successful: the FCLAA enjoyed a number of updates over time, culminating with the 2010 Family Smoking Prevention and Tobacco Control Act, which explicitly empowered the FDA to regulate the industry. Now, fifty years after the Surgeon General's report, most US states have broad smoking bans, and they have also imposed strict regulation on advertising and strict penalties for selling to children.

The reason an agency-based approach to regulation is necessary is that the erosion of the power of the tobacco industry would not have been possible without substantial democratic buy-in. In large part, this erosion was due to anti-tobacco shifts in public opinion: only 41% of the American public recognized smoking as a cause of heart disease in 1954, but by 2013, this had risen to 91%.[17] Prior to the FCLAA, Big Tobacco was not simply a powerful political force in a vacuum; it also sponsored an array of television and radio programming, and tobacco products enjoyed endorsements from doctors, athletes, and celebrities. There were, in modern parlance, significant "network effects" involved

17. See Gallup polls on "Tobacco and Smoking".

in maintaining the political strength of the tobacco lobby. Perhaps unsurprisingly, then, what has proven to be most effective in the reduction of tobacco use has been targeting these network effects rather than more heavy-handed, paternalistic measures. As Cummings and Proctor (2014) note:

> Increasingly, research has demonstrated that the interventions that have the greatest impact on reducing tobacco use are those that alter the social contexts and incentives for using tobacco. Research has shown that the most potent demand-reducing influences on tobacco use have been interventions that impact virtually all smokers repeatedly, such as higher taxes on tobacco products, comprehensive advertising bans, graphic pack warnings, mass media campaigns, and smoke-free policies. Despite promises of the efficacy of different stop smoking treatments, there is not much evidence that any of these therapies have dramatically reduced rates of tobacco use because too few smokers use them when they try to quit (Cummings and Proctor, 2014, pp. 33–34).

The regulatory successes in the tobacco context suggest a similar general approach in the context of new media: we should not aim, for instance, to simply limit people's screen time simpliciter. Luckily, the motivation for limiting screen time is (just as was the motivation for reducing tobacco usage) obvious, given the facts. It is now obvious that increased screen time both harms us and weakens our agency, both as a society and as individuals.

Our regulatory strategy involves a form of product labeling. One radical way of implementing this strategy involves mandatory, unskippable warnings: digital applications, websites, and platforms might carry a warning to the effect of "CAUTION: THE DEPARTMENT OF HEALTH AND HUMAN SERVICES HAS DETERMINED THAT EXCESSIVE SCREEN TIME IS DANGEROUS TO YOUR MENTAL HEALTH." However radical this sort of strategy might seem, such interventions are not unprecedented among social technologies: during the 1990s, arcade games across North America carried anti-drug slogans such as "Winners Don't Use Drugs" as part of their "attract mode", the pre-recorded demo video that is looped when no one is playing them. Our strategy would, just as anti-smoking campaigns, aim to restrict children's access to new media technologies, to avoid instilling harmful habits in an especially vulnerable population.

A more diplomatic way of implementing the product-labeling strategy than mandating a warning screen might be to encourage game and app developers to establish and abide by some sort of self-regulatory organization with the explicit aim of managing user screen time. This idea, too, has antecedents in the history of social technology: the Entertainment Software Rating Board (ESRB) was established in 1994 by the video game industry's own trade association for the purposes of assigning age and content warnings, and the ESRB has since received praise from the Federal Trade Commission as an example of effective self-regulation. In this vein, a screen time advisory board could assign screen time ratings for each app, which offer an independent assessment of the risks and hazards of each app.

However implemented, the product-labeling strategy would necessarily involve a branding campaign of its own, extending beyond the targets of the regulation, to include television billboards and product placements. The campaign should follow existing research on best practices in anti-smoking advertising, and should stress in particular "the positive consequences of [limiting new media], model refusal skills, convey the immediate social and physical problems associated with [new media], and teach adolescents about [new media] marketing" (Pechmann and Reibling, 2000, p. 25). The ultimate objective of the campaign might be to cultivate something along the lines of Shannon Vallor's "global technomoral virtue ethic" (Vallor, 2016), but we accept the more modest goal that users be sufficiently mindful and self-reflective to use existing aids such as Apple's native Screen Time functionality.

Our hope is that such response might help to make at least some improvements across all four of our evaluative criteria: it would hopefully change the way new media is used and designed, thereby mitigating the harms and affronts to agency of the attention economy. Above all, however, we want to emphasize that just as tobacco use has been most effectively managed by attending to the personal incentives and social contexts associated with it, addressing the problems associated with excessive screen time requires a solution that conceptualizes users as agents, not a solution that ignores their agency altogether.

5. Conclusion

Some technology executives, such as Mark Zuckerberg, have called for regulations on Facebook and other new media oligarchs (Isaac, 2019). Zuckerberg's proposal in particular addresses a number of important concerns one might have about the sources of social dysfunction introduced by new media: its tendency to promote violent or antisocial content, its tendency to undermine the integrity of the political process, its resistance to data portability, and its threat to people's privacy.

However, Zuckerberg's proposal pointedly does not call for limiting screen time. This omission is not surprising — the above proposal cuts to the heart of Facebook's business model — but the noxiousness of the attention economy is no longer plausibly in doubt. The attention economy is toxic to important human values, because it harms individuals and society and it engenders and exploits weakened cognitive agency and vulnerability. This market, however, is not one that we need to live with in its current form. As we have shown, our analysis sheds some light on the proper regulatory response. We could treat new media as we have treated other harmful, addictive products: we could inform users of its effects and limit children's access to it.

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