The Perils of Life in the Attention Economy

You're probably reading this on a screen. I'm writing it on one. You might be at a laptop, or if you're really old school, a desktop. But if you're in the majority of people, you're reading it on a mobile phone. Since the iPhone was released in 2007, it has gone from nifty gadget and expensive status symbol to must-have for everyone. The adoption of social media has followed the same trajectory. An ever increasing part of our lives is becoming mediated by the Internet, from social relations, communication and publishing to hailing taxis, ordering food, and finding love. No aspect of life seems safe from being "disrupted" into an algorithmically-mediated network instantly connecting us to everything we want, need, and didn't know that we wanted and needed through a pocket-sized LCD screen.

The Internet has had more than its fair share of cheerleading, from idealistic cyber-utopians to the TED set whose enthusiasms rose with their share values. From both sides of the political spectrum and all corners of the business world, the Internet has been seen as the answer. Even the most pessimistic Luddite cannot deny the massive impact that information technologies have had in recent years. And yet a small but growing number of technologists are beginning to raise concerns around our devices and the dangerous future they may be leading us into. One such Cassandra is Tristan Harris, a former design ethicist at Google and the founder of advocacy group Time Well Spent.

Harris likes to say that the phone in your pocket is a slot machine. At first glance, it sounds like a clever metaphor, a pithy tweet or viral soundbite for the attention-deficient. But it's not. He means it *literally.* The same psychological technique that makes slot machines addictive, known as intermittent variable rewards, is employed by Twitter, Facebook, and other apps on your phone in order to maximize your usage. In order to maximize addictiveness,

product makers link an action (such as pulling a slot machine lever or checking your "Likes") with a varying outcome that sometimes rewards. You might get a good result, like a message from that cutie from your Comm class or some friendly comments on your latest Facebook post, or you might get nothing at all.

According to Natasha Schull in her book *Addiction by Design*, slot machines get people 'problematically involved' 3-4 times faster than other types go gambling. Slot machines make more in the United States than baseball, movies, and theme parks…. *combined*. Variable rewards are inherently addictive, which is why Facebook algorithms will purposefully hold back a user's "Likes" in order to keep them checking, then deliver them all in a big bundle, giving the user a strong reward. It's why Twitter adds a two to three second delay when users log in before displaying the number of new notifications. The neuroscience behind the technique is simple: the anticipation generates the release of dopamine, the neurotransmitter that regulates our brain's reward system. You don't even need to step foot in a casino. Every time you check your phone for notifications, scroll your Instagram feed, swipe left or right on Tinder, pull down to refresh your email, or tap the red notification to see what's underneath, you're playing a slot machine.

Intermittent rewards are only one tool in the growing arsenal of techniques employed by user experience designers to capture your attention. Have you noticed how at some point videos began auto-playing, finite blog posts turned into infinite streams, and the auto-refilling news feed replaced the static web page? In a study by Cornell professor Brian Wansink, people consumed 73% more calories by eating soup in a bottomless, refilling bowl then a normal bowl. Tech companies increasingly exploit this principle to keep us in their feed, gorging on content. Messaging apps are often so intrusive because designers know that interruptions will cause users to engage more, even though the cognitive cost of interruptions to the user is high. A

growing number of "features" and updates in common apps, from read receipts, to Snapchat's "Streaks," to pretty much the entire design of LinkedIn, are rolled out not to improve user's lives, but rather to get them to spend more time in-app.

If you're wondering whether or not this is intentional: it is. Harris studied at Stanford University's Persuasive Technology Lab, which specializes in what its founder B.J. Fogg calls Captology or Behavior Design, where he was classmates with a cofounder of Instagram. At the Persuasive Technology Lab, students study techniques from a variety of fields, including classical Pavlovian conditioning and dog training, to learn how to use computers to change the behaviors and attitudes of users. If it sounds a little creepy, that's because it is. Yet there's no secret here. As the competition for attention increases, companies employ growth hackers continually refining techniques to attract and hold user attention. Fueled by a combination of constant experimentation, ever-growing amounts of user data, machine learning, artificial intelligence, experimental psychology and neuroscience, an arms race for attention is underway in the tech industry.

The tagline of Venice Beach-based Dopamine Labs reads "Dopamine makes your app addictive." Their product, called Dopamine, promises app developers the chance to addict users and "increase engagement and revenue by up to 167%" (an oddly specific number, obviously meant to signal that it's been empirically tested. The number appears to be based on a case study in which one client saw a 167% increase in messaging in their app by using Dopamine). How does it do this? They explain: "The Dopamine API uses Artificial Intelligence and Neuroscience to make your app delightful. It personalizes and adapts the rhythm and timing of a 💥 to surprise and hook each user. Learning and improving over time… Those 💥s of Dopamine don't just feel good: they rewire the brain's habit centers. Reinforcement is how the brain learns habits. The rhythm and timing of the 💥s tell the brain what to get hooked on and

what to ignore." Triggering dopamine release through nicotine? Evil! Triggering it through electronics? The sophisticated development of a delightful product! Have smartphones truly become the new cigarette?

When I first read Dopamine's site, I felt a mix of disgust (this seems wrong) and amusement (are they serious, or is this over-the-top marketing hype?). Online comments indicate that this isn't atypical: people tend to find Dopamine either ingenious or just evil. There's not much middle ground. In an interview with Anderson Cooper on CBS' 60 Minutes, Dopamine Labs CEO and former neuroscience researcher Ramsay Brown calls what they do "brain hacking," an attempt to neurologically stimulate users to increase time on screen. But Dopamine isn't the first and won't be the last company to market such services. Their product simply promises smaller app developers a version of a toolkit that the larger platforms have already spent millions to develop and implement. Ramsay observes that all of us using digital technologies are "guinea pigs in a box, pushing the button and sometimes getting the likes." We are all part of a massive experiment in real-time, subjects in a study done on an unprecedented scale by algorithms we don't understand. The only difference between us and a guinea pig is that our "box" is trying to learn how to keep us in it. The major platforms have already realized what Dopamine's homepage claims their product will deliver: "Your users will crave it. And they'll crave you."

It's not just pleasure that keeps us reaching for our devices: it's fear. Researchers such as Larry Rosen and his team at California State University Dominguez Hills are researching the effect mobile technology has on our anxiety levels. Rosen has found that when you put your phone down, you brain signals your adrenal gland to produce a burst of the hormone cortisol, known as the "stress hormone," which triggers a fight-or-flight response. The same hormone that made us hyper aware of our environments in order to avoid predators is now triggering us

to check our phones. As long as we carry our devices, we live in a state of being "always on" that is historically and biologically unprecedented. The effects of such chronic stress and the impact upon our bodies, particularly our nervous, reproductive, and endocrine systems, are only beginning to be examined. Our ancient anxieties are amplified in the digital age.

If your reasoning is anything like those of Silicon Valley spokespeople, you might say, "Just turn it off. It's up to you whether or not you want to use it." Of course, there is some truth to this, but for most people, opting entirely is just not possible. As social norms change and these technologies become more ingrained in every part of life, we must contend with their effects. Harris argues that it's not a simple matter of personal choice when there are thousands of engineers on the other side of the screen whose sole job is to maximize the time you spend in their app. When teenagers used the phone to talk with friends in say the 1970s, the phone company wasn't trying to figure out how to get them to spend as much time on the phone as possible. While many in libertarian Silicon Valley may see it solely as a matter of individual responsibility, what responsibility do they have to their consumers? No matter what choices designers make, they are implicitly going to influence the behavior of a billion people around the world, whether they want to or not.

We tend to think of tech companies as each providing a unique product: Google provides search, YouTube provides user-generated video, Facebook provides social media. Yet in actuality, every major tech company has the same product: you. They just go about it in different ways. They want your attention so they can capture more data about you. But to pay attention to something means to not pay attention to something else, so platforms are locked in a zero-sum battle against each other to win users' attention. Facebook, Twitter, Snapchat, YouTube, Amazon, Netflix, are all competing with each other, as well as with reading books, spending time with your partner, studying, and everything else in your life. As Netflix CEO Reed

Hastings put it, "We're competing with sleep… and we're winning!" Given that a Deloitte survey found that 90% of millennials indulge in an average of at least five episodes per sitting on the platform, he might be right.

This arms race for attention has led to what Harris calls the "the race to the bottom of the brain stem." When one company introduces a new technique, the rest follow. When YouTube introduced auto-play, Netflix and Facebook did the same, lest they become any less competitive in the war for attention. Companies that can tap into our limbic system, or "lizard brains," capture more attention, because content that can exploit our fear, anxiety, loneliness, and anger has shown to be more successful than high-minded pieces that call out to our better natures. In fact, the lizard brain is driving the entire Web ecosystem. In 2010, Jonah Berger, an expert on vitality at the Wharton School, measured seven thousand articles from the *New York Times* Most E-Mailed List. He found that "the most powerful predictor of vitality is how much anger an article evokes." The study confirmed what savvy marketers and content creators had already figured out: to get your message to spread online, make people angry. The more extreme of a reaction a piece of content can arouse either positively or negatively, the better that piece will perform.

Why must designers and engineers make apps that aim to maximize our time spent using them? Why must they even be engaged in this zero-sum war for attention in the first place? It all comes down to one word: advertising. The attention economy is not the result of the evils tech moguls seeking to reduce us to screen junkies. Tech platforms need users to spend more time on their platforms in order to gain more data about them and deliver ever-more targeted and effective advertising. Google and Facebook are essentially persuasion machines, learning as much as they can about you in order to learn better how to persuade you on behalf of the highest bidder. Even companies that do not rely on advertising, such as Netflix, often

employ the same techniques to get your attention because they have found that if they do not aggressively pursue your attention, their subscription rates drop.

An advertising-based digital economy has a number of unsavory consequences. In order to continually deliver more effective targeted advertising, companies must keep us using their platforms and increase their powers of surveillance to figure us out. This race for ad dollars goes directly against a right to privacy. Academic Shoshana Zuboff has termed this new dynamic "surveillance capitalism." Increased surveillance by private companies means increased surveillance by state actors as well. As Edward Snowden's revelations about the PRISM program in the United States revealed, the National Security Agency did not build its own spy apparatus, but rather, demanded that private companies hand over all of their user data. Advertising also necessarily causes a centralization of the web into fewer platforms, as digital ad networks increase in value the more comprehensive they become. The concentration of communications through the major tech platforms give them an unprecedented ability to monitor and control speech, and in ways that we may not be able to notice or prove. Since very few people inside and no one outside of these companies understand the "black box" of their proprietary algorithms, which are ever changing and increasingly complex, users do not even understand the mechanisms behind the infrastructure on which ever more of our communication is delivered.

Further, advertising incentivizes clickbait and shallow content because its success is measured in how many page views it can generate, not its quality. What happens to a society when its information delivery mechanisms become increasingly addictive, are incentivized to deliver shallow and shocking content, and have no system for arbitrating truth or non-economic value? The personalization that drives targeted advertising is also shredding the fabric of society, as individuals consume content that is specifically geared to greater reinforce their own

beliefs and interests in order to keep them engaged on platform and build a more targeted ad profile of the user. In the wake of the 2016 US Presidential Election and the heightened political polarization in the United States, people have become more aware of these "filter bubbles" and digital echo chambers that result from our tech platforms. One study found that 40% of American voters in 2016 claimed Facebook as their primary news source, and this number is only growing. The major tech platforms are eating the entire publishing industry, and yet their economic incentives are not aligned with those of a functioning democracy. Democracy itself is at risk as we face the specter of dissolving trust in mass media, the loss of common consensus, fragmentation into mutually exclusive visions of reality, and the development of hyper-persuasive technology. In an information economy, consumer profiles are increasingly reinforcing ideological groupings. While Facebook and Google may take small steps to try to ameliorate these concerns, an advertising-based revenue model demands that these trends continue.

The potential consequences of this system are dire. As individuals, our attention is our most valuable resource. All problems are solved by the focused use of our attention, combined with reliable information and a strong sense of our values. And yet our information ecosystem is incentivized against all of these. As we continue to dash headlong into building upon this system with even more immersive technologies such as Virtual Reality and Augmented Reality and as companies race to develop strong AI, we may come to a tipping point where this system becomes nearly impossible to undo. While visions of colonizing Mars and automated transport are sexy, there are problems with our infrastructure now that need to be faced in the present. The Web is foundational to the future, and if its core revenue model is rotten, is it something we should be building upon? Can we solve global problems like climate change without focused

attention and a common consensus? As Neil Postman once warned about television, are we becoming truly in danger of "amusing ourselves to death?"

To avoid this dark fate, more and more critics are speaking up to articulate the problem. Some, such as media theorist and author Douglas Rushkoff, believe that corporate capitalism itself, with its endless need for growth and expansion, is incompatible with a humanistic digital economy. Others such as Harris believe that a consumer education and a consumer-based movement can carve out a niche in the current system that leads to market changes, much as the Organic food movement that created an alternative to the industrial food system. Harris has also advocated for a "Geneva Convention of persuasion," where tech companies would agree to not employ certain techniques that exploit the limits of the human brain, and would put a limit on "how low on the brain stem" such technologies could tap into. Tim Wu, author of *The Attention Merchants*, believes it's possible to renegotiate the terms of what we consider the limits of advertising, as consumers have done several times in the past. Wu says that we need to realize that tech platforms are not actually free, since we pay with distracted minds and buying things we don't need, and that consumers need to suck it up and be willing to pay for quality content again.

Aside from joining a consumer or social movement, what can we do to change this state of affairs? The first step is awareness. This is not a social issue happening in some faraway place; this is about the very core of who we are and how we spend our time. By becoming aware of powerful forces at play seeking to gain our attention, we can become conscious of how we spend our time and attention, about what is truly important to us. If our attention is so valuable to tech companies, why is it often not to ourselves? If there is anything to take away from the attention economy, it is to remember that our lives are indeed the ultimate scarce resource, that our time is limited, and that our power over our time and attention is the greatest

power we have as individuals. Even beyond advertising, there may be a fundamental flaw with

an information society, which is that there are hard limits to our time and attention and more

options than we could ever scratch the surface of. Yet we need not see this as a flaw, but as a

wakeup call. We may not control the world, but we do control what we give our time, attention,

and thought to. When we consider the power of the technologies we hold in our hand, and those

on the other side of the screen, we can ask ourselves how we want to use such power, and be

aware that it is using us in return. Are we turning to our phone to keep ourselves at bay, to keep

ourselves from the thoughts, feelings, and boredom that lie within ourselves? Are we longing for

the actual warmth and aliveness of real human connection? Are we afraid of missing out on

something important, without realizing how much we miss out on when we get sucked in by our

screens?