

A WINDOW OF OPPORTUNITY TO REGULATE ADDICTIVE TECHNOLOGIES

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INTRODUCTION

Many people have realized by now they spend a lot of time on screens. Often more than they intend.¹ The data reflects this. Screen time has increased steadily, particularly since 2009. Even before the Covid-19 pandemic, adults spent around five hours on

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¹ Fifty-eight percent of adults surveyed in 2022 said they use their phones too much, up from thirty-nine percent in 2015. Lydia Saad, *Americans Have Close but Wary Bond with Their Smartphone*, GALLUP NEWS (June 20, 2022), <https://news.gallup.com/poll/393785/americans-close-wary-bond-smartphone.aspx>. A Pew Research Study found fifty-one percent of parents thought their children spent too much time playing video games in 2021, up from thirty-one percent in 2020. In the same study, forty-two percent of parents thought their children spent too much time on their smartphones, up from twenty-eight percent in 2020. Colleen McClain, *How Parents' Views of Their Kids' Screen Time, Social Media Use Changed During COVID-19*, PEW RSCH. CTR. (April 28, 2022), <https://pewrsr.ch/3Koo0qU>.

their phones,² and teens spent around seven hours a day on screens for non-school activities.³ How did these online hours aggregate, despite parents' concerns and increased evidence of the harms of excessive screen time? The answer lies with the technology industry. Tech companies used manipulative designs to extend users' time on screens. The internet economy's business model relies on extending user time online to collect more data and target more advertising at users.

This Article aims to answer why regulators did not intervene for years to protect users, especially children, from the harms of excessive screen time.⁴ It does so by developing law and technology theory to examine what influences the creation and breadth of windows of opportunity to regulate new technologies.⁵ Specifically, it identifies three factors that can obstruct the creation of meaningful windows of opportunity: (i) the invisibility of the technology; (ii) rapid entrenchment of norms and business interests; and (iii) social and institutional resistance to early intervention. The article also offers insight into how the occurrence of mega-historical events, such as the Covid-19 pandemic, can reopen windows of opportunity.

The Article begins by describing the factors that affect the creation of windows of opportunity to regulate new technologies and analyzing how these factors influenced the technology overuse problem. First, it discusses the Science and Technology Studies (STS) concepts of closure and invisibility. Usually, when people start using new technology, there is a period of interpretive flexibility. During this period, designers and users explore different options of design and use. Eventually, the technology reaches closure. From that point onward, changing the technology becomes harder.

² Eileen Brown, *Americans Spend Far More Time on Their Smartphones Than They Think*, ZDNET (Apr. 28, 2019), <https://www.zdnet.com/article/americans-spend-far-more-time-on-their-smartphones-than-they-think/>.

³ VICTORIA RIDEOUT & MICHAEL B. ROBB, COMMON SENSE MEDIA, *THE COMMON SENSE CENSUS: MEDIA USE BY TEENS AND TWEENS* (2019). These numbers include watching television, which is on the decline, and online video watching, which is on the incline.

⁴ This Article focuses only on timing. It does not address the ways to contain technology overuse, which I address in detail in GAIA BERNSTEIN, *UNWIRED: GAINING CONTROL OVER ADDICTIVE TECHNOLOGIES* (forthcoming 2023).

⁵ The Article does not argue that these are the only factors that affect windows of opportunity but that these are important factors that should be considered in policy decisions involving technology regulation. Specifically, the Article does not argue that early intervention is the preferred approach for regulating new technologies.

Additionally, with closure, technology often becomes invisible. People no longer notice the technology or think about how to use it. However, people's relationship with screens and their decision-making about time spent on screens evolved differently. The technology design that made screens addictive and extended users' time online was invisible and time online extended without users noticing it. As a result, society did not go through a process of interpretive flexibility – users did not reflect on how much and what they wanted to communicate virtually. Invisibility escalated closure and by the time media reports and whistleblowers shed light on the problem, our society was so reliant on screens that the window had already closed.

Second, as users failed to notice the technology overuse problem, user norms and business interests quickly entrenched themselves. Once norms and business interests are entrenched, the window of opportunity closes. At that point, legal change faces significant obstacles. By the time the media and whistleblowers made the public aware of the technology overuse problem, both user norms and business interests were deeply engrained.⁶ Screens permeated practically every aspect of everyday lives. And the primary business model of the internet economy relied on maximizing user time. Tech companies resisted any change that threatened their business model.

Finally, U.S. regulators generally resist early intervention to regulate new technologies. Their resistance stems from a strong social ethos that innovation promotes progress and human welfare. U.S. regulators applied this approach most consistently to information technology, particularly the Internet. Hence, they largely opted for a wait-and-see approach in addressing technology overuse.⁷

While the Article explains how and why the window of opportunity to contain technology overuse rapidly closed, it turns to argue that certain mega-historical events can shake up entrenched norms and practices and re-establish opportune moments to regulate. The Covid-19 pandemic was the mega-historical event that reopened the window for technology overuse. While the pandemic exacerbated the technology overuse problem by significantly

⁶ See II., *infra*.

⁷ See III.C., *infra*.

increasing screen time, it also made the technology visible. People realized how much time they spent on screens and how it affected their well-being, families, and relationships. They realized they had choices. This realization, coupled with increasing scientific evidence of the harms of technology overuse, and testimony by whistleblowers about how technology companies manipulate our time, created a window of opportunity to regulate technology overuse, not to return to a screenless world, but to find a better online-offline balance.

I. TECHNOLOGY OVERUSE

Adults, teens, and children spend many of their waking hours on devices. Surveys show that even before 2020 when the Covid-19 pandemic made virtual communications a necessity of life, individuals spent a significant amount of time online. Studies conducted in 2018-2019 found that adults spent five and a half hours on their phones daily. This measurement excludes time spent on computers or tablets.⁸ The findings indicated that kids' screen time was even higher. A major national survey in 2018 found that forty-five percent of teens said they used the Internet "almost constantly."⁹ A 2019 national survey reported that kids aged 8-12 spent, on average, five hours on screens per day, while teens spent an average of seven and a half hours. These hours did not include time spent on schoolwork.¹⁰

These numbers reflected a change in social norms. People now take their phones and their virtual connections wherever they go. Many activities, including socializing, shopping, or playing, shifted from personal physical interactions to digital interactions. People talk less. They send written messages much more. They interact less in person and more through social networks. Individuals are less likely to shop in the nearby supermarket and more likely to order their groceries online. Children spend less time playing outdoors and much more on online games. And teens' high school drama is more likely to occur on Instagram than in a mall or a party.¹¹

⁸ Brown, *supra* note 2.

⁹ MONICA ANDERSON & JINGJING JIANG, PEW RSCH. CTR., TEENS, SOCIAL MEDIA, AND TECHNOLOGY 2018 (2018).

¹⁰ RIDEOUT & ROBB, *supra* note 3.

¹¹ See generally JEAN M. TWENGE, "Internet: Online Time—Oh, and Other Media Too," in IGEN: WHY TODAY'S SUPER-CONNECTED KIDS ARE GROWING UP LESS REBELLIOUS, MORE TOLERANT, LESS HAPPY—AND COMPLETELY UNPREPARED

Technology instigated this shift in social norms around 2009 when two technological innovations took off: the smartphone and social networks.¹² Smartphones enabled people to take online communications anywhere, while social networks replaced many in-person interactions, especially for teens. Few noticed, at first, as their screen hours piled up. People did not make deliberate decisions to spend so much time online. Instead, they made many small decisions, such as starting to use email and text while commuting, joining Instagram, or playing Fortnite. These small decisions cumulatively replaced ancient human modes of personal interactions with virtual interaction. But as users added one popular app to another, many found themselves unintentionally spending many of their waking hours online.

II. THE DRIVERS BEHIND TECHNOLOGY OVERUSE

Users believe they choose to spend a lot of time on Instagram. But it is not users' autonomous choice and desire that keeps them on the platform for so long. Tech companies' invisible design manipulates users' psychological vulnerability, hooks them to platforms for longer than they intend, and keeps beckoning them to return.¹³ Whistleblowers defecting from Silicon Valley's largest companies, such as Google and Facebook, disclosed how the technology industry manipulates users.¹⁴ Frances Haugen, a former Facebook employee, revealed that Facebook knows its algorithm maximizes user time online by exposing kids to harmful content and

FOR ADULTHOOD, 69-92 (2017); SHERRY TURKLE, RECLAIMING CONVERSATION: THE POWER OF TALK IN A DIGITAL AGE (2016).

¹² Joshua Boyd, *The History of Facebook: From BASIC to Global Giant*, BRANDWATCH (Jan. 25, 2019), <https://www.brandwatch.com/blog/history-of-facebook/>; Susannah Fox & Lee Rainie, *The Web at 25 in the U.S.*, PEW RSCH. CTR. (Feb. 27, 2014), <https://www.pewresearch.org/internet/2014/02/27/the-web-at-25-in-the-u-s/>; *With Smartphone Adoption on the Rise, Opportunity for Marketers Is Calling*, NIELSEN (Sept. 15, 2009), <https://www.nielsen.com/us/en/insights/article/2009/with-smartphone-adoption-on-the-rise-opportunity-for-marketers-is-calling/>.

¹³ Daniel Susser et al., *Technology, Autonomy, and Manipulation*, 8 INTERNET POL'Y REV., June 2019, at 1.

¹⁴ Bianca Bosker, *The Binge Breaker*, THE ATLANTIC (Nov. 2016), <https://www.theatlantic.com/magazine/archive/2016/11/the-binge-breaker/501122/>; THE SOCIAL DILEMMA (Netflix 2020); Victor Ordonez, *Key Takeaways from Facebook Whistleblower Frances Haugen's Senate Testimony*, ABC NEWS, (October 5, 2021), <https://abcnews.go.com/Politics/key-takeaways-facebook-whistleblower-frances-haugens-senate-testimony/story?id=80419357>.

provoking hate online. It chooses to prioritize its profits over people.¹⁵

As Cass Sunstein wrote: “Manipulation takes multiple forms. It has at least fifty shades.”¹⁶ Technology companies use different techniques to manipulate users’ deepest human vulnerabilities to extend users’ time on their platforms. For example, a common manipulation strategy implements the Intermittent Reward Model. When people receive food, social appreciation, money, or any reward they desire on an unpredictable schedule (i.e., they do not know when they will get the reward), their brains release more of the pleasure-enhancing neurotransmitter dopamine. Many platforms, including social networks and games, and devices, such as smartphones, retain users’ attention by offering unpredictable rewards that entice users to stay for more.¹⁷ Notifications are a popular form of intermittent reward. Users keep picking up their phones to see if they have received notifications. The “pull to refresh” feature is another application of this strategy. Users pull to refresh Twitter, Facebook, or Instagram to check what new likes they got or whether there is an interesting new post or photo. They keep pulling to refresh hoping to get their reward. Tinder, the popular dating app, also uses swipes. Users keep swiping, and sometimes Tinder rewards them with a dating match. Finally, users playing online games may find surprise treasures that enhance their characters’ abilities, although often they come up empty-handed and keep searching.¹⁸

The prevalence of design features that extend user time on platforms and devices is no coincidence. The technology industry

¹⁵ Whistleblower Hearing Before the Subcomm. on Consumer Prot., Prod. Safety, and Data Sec. of the Sen. Comm. on Com., Sci. and Transp., 117th Cong. (Oct. 4, 2021) (written statement of Frances Haugen, former employee of Facebook), <https://www.commerce.senate.gov/services/files/FC8A558E-824E-4914-BEDB-3A7B1190BD49.pdf>; Ordonez, *supra* note 14.

¹⁶ Cass R. Sunstein, *Fifty Shades of Manipulation*, 1 J. OF MKTG. BEHAV. 213, 216 (2015). *See also* Ryan M. Calo, *Digital Market Manipulation*, 82 GEO. WASH. L. REV. 995, 1032 (2014).

¹⁷ Michael D. Zeiler, *Fixed-Interval Behavior: Effects of Percentage Reinforcement*, 17 J. EXPERIMENTAL ANALYSIS BEHAV. 177 (March 1972); NATASHA DOW SCHUL, *ADDICTION BY DESIGN: MACHINE GAMBLING IN LAS VEGAS* (new in paper ed. 2014).

¹⁸ *See* ADAM ALTER, *IRRESISTIBLE: THE RISE OF ADDICTIVE TECHNOLOGY AND THE BUSINESS OF KEEPING US HOOKED* 76–77 (2017); Tristan Harris, *How Technology is Hijacking Your Mind – from a Magician and Google Design Ethicist*, MEDIUM (May 18, 2016), <https://medium.com/thrive-global/how-technology-hijacks-peoples-minds-from-a-magician-and-google-s-design-ethicist-56d62ef5edf3>.

relies on users' time and attention to sustain its business model. Many technology companies, such as Facebook and Google, do not charge users fees. Instead, they sell ads. They collect user data and use it to target ads for products and services they predict these users would most like to purchase. Their ad revenues increase when users spend more time online. Let us take Facebook as an example. Facebook can collect more user data when users linger for longer on its platform. Second, when users spend more time on Facebook, it can expose them to more ads. Thus, the Internet economy's business model relies on design strategies that produce technology overuse because user time is a vital resource of the business model.¹⁹

III. WINDOWS OF OPPORTUNITY

A. *Invisibility and Closure*

New technologies can create both opportunities and uncertainties.²⁰ How can they be used? By whom? For example, the innovators introducing the phone initially thought it would be used for business. But people started using phones for social conversations.²¹ When a new technology comes in, there is usually a window of opportunity: a period of "interpretive flexibility." During that time, designers and users explore different options of design and use.²² Eventually, the window shuts and society reaches the stage that the Social Shaping of Technology (SST) movement coined as closure.²³

What is closure? Closure is the point at which interpretive flexibility is lost. Although it is possible to regain interpretive flexibility, it becomes much more difficult. Once a technology reaches closure, society no longer examines its potential designs or

¹⁹ See generally JOHANN HARI, *STOLEN FOCUS: WHY YOU CAN'T PAY ATTENTION—AND HOW TO THINK DEEPLY AGAIN* (2022).

²⁰ Rebecca Crootof & BJ Ard, *Structuring TechLaw*, 34 HARV. J. L. & TECH. 348, 365 (2021).

²¹ See Claude Fischer, *The Telephone Industry Discovers Sociability*, in TECHNOLOGY AND CHOICE: READINGS FROM TECHNOLOGY AND CULTURE (Marcel C. LaFollette & Jeffrey K. Stine eds., 1991).

²² On user innovation, see generally Katherine J. Strandburg, *User Innovator Community Norms: At the Boundary Between Academic and Industry Research*, 77 FORDHAM L. REV. 2237 (2009); Rochelle Cooper Dreyfuss, *Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm*, 31 CARDOZO L. REV. 1437 (2010).

²³ Gaia Bernstein, *When New Technologies are Still New: Windows of Opportunity for Privacy Protection*, 51 VILL. L. REV. 921, 941 (2006).

uses. Neither does it experiment with different social norms surrounding the technology. Controversy subsides, and we generally adjust to a specific design and set of norms surrounding its use. At that point, there is less flexibility, and further change becomes less likely. In addition, once a technology reaches closure, it becomes invisible.²⁴ When technology is invisible, we no longer think about it or notice how we use it. Take, for example, the toaster. When did you last pay attention to its design or consider using it significantly different? We tend to use toasters thoughtlessly because the toaster has reached closure. It is invisible.

The history of the bicycle illustrates how technology goes through a period of interpretive flexibility and eventually reaches closure. The bicycle we know today has two wheels of equal size, and we use it for transportation. But when the bicycle emerged in the nineteenth century, society had to determine its design and use. Bicycle makers flirted with different designs, including tricycles (three-wheel bicycles) and bicycles that resembled horses. A particularly popular early conception of the bicycle was as a macho sports vehicle. This idea of the bicycle gave rise to different designs all emphasizing the size of the front-wheel. For example, one design had a front wheel that was ten times larger than the back wheel. It was quite a feat to ride that bicycle; and primarily, young men rode it, showing off their skills. At the same time, an alternative dominant view of the bicycle emerged. Promoters of this view conceived the bicycle as a vehicle and advanced bicycle designs that improved safety. Eventually, the conception of the bicycle as a transportation vehicle prevailed. The bicycle stabilized to the form we know today. At that point, the bicycle reached closure. The window of opportunity for interpretive flexibility of its design and use is

²⁴ On closure, see WIEBE E. BIJKER, OF BICYCLES, BAKELITES AND BULBS: TOWARD A THEORY OF SOCIOTECHNICAL CHANGE 84-85 (1995); Stewart Russell & Robin Williams, *Social Shaping of Technology: Frameworks, Findings, and Implications for Policy with Glossary of Social Shaping Concepts*, in SHAPING TECHNOLOGY, GUIDING POLICY: CONCEPTS, SPACES AND TOOLS 37, 58, 120 (Knut H. Sorensen & Robin Williams eds., 2002). See also Monika Zalnieriute & Lyria Bennett Moses, *Law and Technology in the Dimension of Time*, in TIME, LAW AND CHANGE: AN INTERDISCIPLINARY STUDY 303, 309 (Sofia Ranchordas and Yaniv Roznai eds. 2020) (explaining that choosing to regulate too late means that socio-technical systems are less flexible, and changes are very expensive or even impossible). *But cf.* Graham Thomas & Sally Wyatt, *Shaping Cyberspace—Interpreting and Transforming the Internet*, 28 RSCH. POL'Y 681, 696 (1999) (concluding closure on the internet has at times been achieved and undone with the involvement of new actors, the connection of networks using different protocols, and the development of new interfaces and applications).

unlikely to reopen. The bicycle, like the toaster, has become invisible.²⁵

New technologies often create ambiguities and uncertainties.²⁶ But what about when they don't? Users, then, do not ask questions or explore options. Instead, they accept the technology as is, not because it is inconsequential, but sometimes because it is invisible from the start. In that case, the technology's invisibility prevents the interpretive flexibility stage, and it rapidly reaches closure. Closure occurs without social reflection on choices of design and use.

Some technologies are more invisible than others. They are opaque. We can see little of the design choices made to produce them and influence their use. The Internet is one of these technologies. When we go online, we cannot see many of the choices that tech companies make and how they affect us. The collection of personal data of Internet users was one of these invisible choices.

Tech companies started using cookies to collect information early on in 1994.²⁷ Even when cookies and how they operate became common knowledge, users could not see them. Consequently, users usually did not make choices to protect their privacy online. Companies continued to collect and use personal data online, and non-privacy norms became rampant.²⁸ While the bicycle reached closure after decades of shifting between the athletic macho and transportation conception, online non-privacy norms reached closure within several years. Once the window for interpretive flexibility closed, reversing companies' privacy practices became very difficult.²⁹

Sometimes even when technology's design is invisible, the technology draws significant attention and undergoes a process of interpretive flexibility. However, invisibility increases the risk that society will not engage in interpretive flexibility. Tech companies

²⁵ See BIKER, *supra* note 24.

²⁶ Crootof & Ard, *supra* note 20.

²⁷ See, JOSEPH TUROW, *THE DAILY YOU: HOW THE NEW ADVERTISING INDUSTRY IS DEFINING YOUR IDENTITY AND YOUR WORTH* 48 (2011).

²⁸ This is where the privacy paradox comes in: people say they care about privacy, but their actions online do not reflect that. See Spyros Kokolakis, *Privacy Attitudes and Privacy Behavior: A Review of Current Research on the Privacy Paradox Phenomenon*, 64 *COMPUTS. & SEC.* 122 (2017).

²⁹ Bernstein, *supra* note 23, at 943.

use of manipulative designs to extend users time online was as invisible as cookies and encountered the same fate. The tech industry stealthily designed its products and perfected its algorithms to hook us on its platforms and devices. Although screens themselves were visible, the technology design that made them addictive and extended users' time online was invisible and consequently, so often was the time spent online. Time slipped away without notice. Society did not undergo a process of interpretive flexibility in which it reflected on how much time would be best to spend on screens. Instead, starting around 2009, people made small decisions, such as joining a social network or playing an online game, without contemplating the full impact. As a society, we did not reflectively endorse a way of life that is increasingly on screens with limited face-to-face physical interactions. The designs of the devices, websites, and apps we used manipulated our choices.³⁰

By the time media reports and struggling parents realized the extent and impact of time spent online, the window of interpretive flexibility had shut, and we had reached closure.³¹ At that point many people's day-to-day interactions already relied heavily on virtual communications, such as messaging, social networks, and online games; and smartphones accompanied individuals everywhere they went. As was the case with non-privacy norms, invisibility once again has escalated closure with no debate or reflection. Society has again endorsed a choice many people would have likely rejected had they reflectively evaluated it.³²

B. Entrenchment of Norms and Business Interests

³⁰ On online manipulation, see generally Susser et al., *supra* note 13; Daniel Susser, Beate Roessler, & Helen Nissenbaum, *Online Manipulation: Hidden Influences in a Digital World*, 4 GEO. L. TECH. REV. 1, 13 (2019). See also BRETT M. FRISCHMANN & EVAN SELINGER, RE-ENGINEERING HUMANITY 250 (2018) (discussing the fable of the frog in the boiling water which symbolizes the process in which people fail to notice the situation which they are in until it is too late).

³¹ For a sampling of U.S. media reports from this period (2016–17), see e.g., Dan Fitzsimmons, *Summertime: Less Screen Time*, DAILY GAZETTE (Schenectady, NY), June 8, 2017 (Capitol Region Summer), at 82; Jenna Sachs, *Limit Your Kids Screen Time*, FOX 6 WITI (Milwaukee, WI), June 7, 2017 (Consumer Reports); Chandra Johnson, *Screening Screen Time?* DESERET MORNING NEWS (Salt Lake City, UT), Dec. 7, 2016. See also WAIT UNTIL EIGHTH, <http://www.waituntil8th.org/> (last visited July 4, 2022).

³² On the impact of the loss of interpretive flexibility and the opportunity to reflect upon screen time choices on individual autonomy, see BERNSTEIN *supra* note 4. See also Lauren E. Willis, *Deception by Design*, 34 HARV. J. L. & TECH. 115, 132–34 (2020) (discussing the illusion of control).

Business interests and social norms also impact the window of opportunity. Laws are less likely to be effective where they sharply digress from existing social norms.³³ In addition, once business interests rely significantly on the use of a technology in a certain way, they are likely to oppose any legal measures that could interfere with it.³⁴ When either social norms or business interests are firmly entrenched, legal change faces a significant obstacle. In the case of technology overuse, both are deeply entrenched.

Social norms of technology overuse weave throughout individuals' daily lives. Indeed, humans' symbiotic relationship with screens permeates twenty-first-century life. Parents focus on getting the best angle to film their children's performance on their phones instead of just watching the show.³⁵ Teens prefer to stay home, posting and messaging on social networks, rather than meet in person.³⁶ People waiting in line instinctively pull out their phones and start scrolling.³⁷ We have learned to act a certain way when alone or with others. Changing these now deeply engrained social norms is unlikely to be easy.

The Internet economy, as discussed, is highly invested in ensuring that users spend as much time online as possible. More time online means that tech companies can harvest more data. It also means more exposure to targeted ads, that increase the chance that users will purchase the advertised services and products. Therefore, more time online equals more revenue, where reducing this overuse

³³ See Dan Kahan, *Gentle Nudges vs. Hard Shoves: Solving the Sticky Norms Problem*, 67 U. CHI. L. REV. 607, 608 (2000); Elizabeth S. Scott, *The Legal Construction of Norms: Social Norms and the Legal Regulation of Marriage*, 86 VA. L. REV. 1901, 1926–28 (2000).

³⁴ For example, video game creators and manufacturers pushed back against efforts by the Federal Trade Commission, Congress, and individual states to limit or regulate violence in video games in the early 2000s. See, e.g., Clay Calvert & Robert Richards, *Precedent be Damned - It's All about Good Politics & Sensational Soundbites: The Video Game Censorship Saga of 2005*, 6 TEX. REV. ENT. & SPORTS L. 79, 125–26 (2005); Kevin W. Saunders, *Regulating Youth Access to Violent Video Games: Three Responses to First Amendment Concerns*, 2003 L. REV. M.S.U.-D.C.L. 51; William K. Ford, *The Law and Science of Video Game Violence: What Was Lost in Translation*, 31 CARDOZO ARTS & ENT. L.J. 297 (2013).

³⁵ Gaia Bernstein, *The Cost of Capturing Moments*, Gaia Bernstein's Blog, (August 30th, 2018) <https://gaiabernstein.com/the-cost-of-capturing-memories/>.

³⁶ TWENGE, *supra* note 11.

³⁷ On smartphone addiction, see generally, Tayana Panova & Xavier Carbonell, *Is Smartphone Addiction Really an Addiction?*, 7 J. BEHAV. ADDICTIONS 252 (2018).

threatens the core of this business model. It is no surprise that tech companies resist real change. Instead, they offer different digital well-being measures, like Apple's screen time, which notifies users how much time they spend online but doesn't change core addictive features.³⁸ The entrenchment of the Internet economy's business interests in maximizing screen time is a significant hurdle to change.

C. Resistance to Early Intervention

Attitudes toward early regulation of new technologies differ depending on the type of technology. They also diverge between jurisdictions. European countries, especially when assessing the impact of new technologies on health and the environment, often apply the precautionary principle.³⁹ They regulate early to protect the public from potential risks of new technologies. However, this approach carries a cost. The cost is taking precautions that may later prove unnecessary. The United States tends to shy away from early intervention when evaluating protections against information technology such as computers, the Internet, and mobile devices.⁴⁰

Faith that technological innovation promotes progress and human welfare drives the preference to avoid early intervention. This admiration of innovation influences policy decisions in many areas.⁴¹ Take, for example, the U.S. education policy for integrating

³⁸ Gaia Bernstein, *How Antitrust Actions Against Big Tech Can Reduce Technology Over-Use*, Gaia Bernstein's Blog, (October 23, 2020), <https://gaiabernstein.com/how-antitrust-actions-against-big-tech-can-reduce-technology-over-use/> (discussing Big Tech's business model). About digital well-being methods, see generally Alberto Monge Roffarello & Luigi De Russis, *The Race Towards Digital Wellbeing: Issues and Opportunities*, CHI 2019: PROCEEDINGS OF THE 2019 CHI CONFERENCE ON HUMAN FACTORS IN COMPUTING SYSTEMS 2.

³⁹ See generally, Cass R. Sunstein, *Beyond the Precautionary Principle*, 151 U. PA. L. REV. 1003 (2003).

⁴⁰ For discussions of differences between the application of the precautionary principle in the United States and Europe, see Noah M. Sachs, *Rescuing the Strong Precautionary Principle from Its Critics*, 2011 U. ILL. L. REV. 1285 (2011); Lawrence A. Kogan, *The Extra-WTO Precautionary Principle: One European "Fashion" Export the United States Can Do Without*, 17 TEMP. POL. & CIV. RTS. L. REV. 491 (2008). See also Adam Thierer, *Technopanics, Threat Inflation, and the Danger of an Information Technology Precautionary Principle*, 14 MINN. J.L. SCI. & TECH. 309, 352 (2013) (discussing the application of the precautionary principle to information technology).

⁴¹ See generally Gaia Bernstein, *In the Shadow of Innovation*, 31 CARDOZO L. REV. 2257 (2010); CHRISTOPHER LASCH, *THE TRUE AND ONLY HEAVEN: PROGRESS AND ITS CRITICS* (1991). Although not all believe that technological progress will lead to human flourishing, it is a dominant social ethos. *But cf.* Leo

technology in the classroom, commonly known through the slogan “a laptop for every child.” This policy still dominates today despite significant evidence pointing to the ineffectiveness of replacing live teachers with screens and the need for a more granular approach.⁴²

Those opposing early intervention caution against intervening to regulate before the social uses of new technology are fully known.⁴³ They caution that it could preclude essential opportunities. Technology innovators sometimes envision a product’s role differently than how users adopt the technology.⁴⁴ As mentioned, phone companies marketing the telephone promoted it at first only as a business tool. They never imagined that society would use it for social purposes. But soon, users turned it into a social tool.⁴⁵ Opponents of early intervention warn that moving too early could not just preclude unanticipated uses but also produce poorly designed laws that do not match the eventual use of the technology.⁴⁶

U.S. regulators seeking to promote innovation in information technology, and fearing regulating in the dark, unsurprisingly, often opted for a wait-and-see approach.⁴⁷ As discussed, addictive designs are invisible. The invisibility of the technology conflated with regulators’ inclination to wait-and-see rather than intervene early predictably resulted in inaction. This

Marx, *Does Improved Technology Mean Progress?* in TECHNOLOGY AND THE FUTURE (Albert H. Heich ed. 2006).

⁴² *Reimagining the Role of Technology in Education: 2017 National Education Technology Plan Update*, OFF. EDUC. TECH. (Jan. 2017); BERNSTEIN, *supra* note 4.

⁴³ See Lyria Bennett Moses, *Understanding Legal Responses to Technological Change: The Example of In Vitro Fertilization*, 6 MINN. J.L. SCI. & TECH. 505 (2005).

⁴⁴ Arie Rip and Johan W. Schot, *Identifying Loci for Influencing the Dynamics of Technological Development*, in SHAPING TECHNOLOGY, GUIDING POLICY: CONCEPTS, SPACES AND TOOLS 155, 156 (Knut H. Sorensen & Robin Williams eds., 2002).

⁴⁵ See Fischer, *supra* note 21.

⁴⁶ Zalnieriute & Bennett Moses, *supra* note 24.

⁴⁷ Gaia Bernstein, *The Role of Diffusion Characteristics in Formulating a General Theory of Law and Technology*, 8 MINN. J.L., SCI. AND TECH. 623, 635–36 (2007). Hernan Galperin & François Bar, *The Regulation of Interactive Television in the United States and the European Union*, 55 FED. COMM. L.J. 61 (2002) (describing the wait-and-see approach taken by American regulators with regard to interactive television); Mark A. Lemley & Lawrence Lessig, *The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era*, 48 UCLA L. REV. 925 (2001) (describing the FCC’s wait-and-see approach regarding the regulation of cable Internet access).

inaction produced the entrenchment of both social norms and business interests that perpetuated the technology overuse problem.

IV. A WINDOW REOPENS

Windows of opportunity can fail to properly materialize or close. That seemed to be the case at the beginning of 2020. Individuals did not have an opportunity to autonomously reflect on how much time they should spend online. And it seemed like the window to determine the online-offline balance that would serve people's best interests had shut. But then a mega-historical event took place, which intensely illuminated the choice society had made and the trajectory it was headed. The pandemic swiftly accelerated everyone's reliance on screens and powerfully highlighted the ramifications of this choice. It also drew more attention to the accumulating scientific findings about the cost of escalating screen time.

A. A Mega-Historical Event

Mega-historical events are rare, but when they occur, they can shake up even entrenched norms and practices, changing the course of history. 9/11 could qualify as such an event.⁴⁸ It transformed the political priorities of fighting terrorism and Americans' sense of safety. It also drastically changed how the government used technology to collect information about individuals.⁴⁹ While people may debate whether certain events

⁴⁸ I do not endeavor here to enter the academic debate of what counts as a historical event. For an example of this debate, see Hayden White, *The Historical Event*, 19 *DIFFERENCES* 9 (2008). The public has its own perceptions of what should be considered major historical events and opinions can vary. See PEW RSCH. CTR., *AMERICANS NAME THE 10 MOST SIGNIFICANT HISTORIC EVENTS OF THEIR LIFETIMES* (Dec. 15, 2016),

<https://www.pewresearch.org/politics/2016/12/15/americans-name-the-10-most-significant-historic-events-of-their-lifetimes/> (a survey of people's most significant lifetime historical events, highlighting the significance of 9/11). For my purpose here I focus on historical events that appear to be of great significance to the generations who lived through them.

⁴⁹ Laws like the Patriot Act enacted after 9/11 facilitated collection of information about individuals. See, e.g., The USA Patriot Act, 18 U.S.C. § 2511(2)(f) (2001) (extending the purposes for gathering information under the Foreign Intelligence Surveillance Act). The National Security Agency (NSA) began intercepting Americans' phone calls and Internet communications. See Paul M. Schwartz, *Reviving Telecommunications Surveillance Law*, 75 *U. CHI. L. REV.* 287, 305–09

qualify as a mega-event, most would consider events like World War II and the Covid-19 pandemic as mega-events that destabilized our lives.⁵⁰

In early 2020 when the Covid-19 pandemic began, people went into lockdowns worldwide. They stayed at home with screens as the only outlet for work, social meetings, and entertainment. Schools became virtual schools, and social get-togethers took place online. Screens mediated practically every aspect of our lives.⁵¹ Unsurprisingly, screen time rocketed. While screen time increased for all, kids' screen time increased most significantly.⁵² For

(2008). See generally Daniel J. Solove, *Data Mining and the Security-Liberty Debate*, 75 U. CHI. L. REV. 343 (2008).

⁵⁰ See, e.g., Frank Newport et al., *The Most Important Events of the Century from the Viewpoint of the People*, GALLUP (Dec. 6, 1999), <https://news.gallup.com/poll/3427/most-important-events-century-from-viewpoint-people.aspx> (ranking World War Two as the most significant event in the 20th Century according to Americans); Claudia Dean et al., *A Year of U.S. Public Opinion on the Coronavirus Pandemic*, PEW RSCH. CTR. (Mar. 5, 2021), <https://www.pewresearch.org/2021/03/05/a-year-of-u-s-public-opinion-on-the-coronavirus-pandemic/> (finding that by April of 2020, two-thirds of Americans saw the Coronavirus as a significant crisis at the time).

⁵¹ See Colleen McClain et al., *The Internet and the Pandemic*, PEW RSCH. CTR. (Sept. 1, 2021), <https://www.pewresearch.org/internet/2021/09/01/the-internet-and-the-pandemic/>; Martha DeGrasse, *4 Ways COVID-19 Is Changing Mobile Phone Usage*, FIERCEWIRELESS (Apr. 8, 2020, 12:35PM), <https://www.fiercewireless.com/wireless/three-ways-covid-19-changing-mobile-phone-usage>; GLOBAL WEB INDEX, CORONAVIRUS RESEARCH APRIL 2020 SERIES 4: MEDIA CONSUMPTION AND SPORT (2020); Lauren Aratani, *'Zoom University': is College Worth the Cost Without the In-person Experience?*, GUARDIAN (Oct. 6, 2020, 5:00 AM), <https://www.theguardian.com/world/2020/oct/06/zoom-university-college-cost-students-in-person-experience>; *US Covid Deaths Top 250,000, NYC Schools: Online Only, Vaccine Delivery System*, NPR NEWS (Nov. 19, 2020, 5:58 AM), <https://www.npr.org/2020/11/15/935212878/us-covid-deaths-top-250-000-nyc-schools-online-only-vaccine-delivery-system>.

⁵² See Brook E. Wagner et al., *Recreational Screen Time Behaviors During the COVID-19 Pandemic in the U.S.: A Mixed-Methods Study Among a Diverse Population-Based Sample of Emerging Adults*, 18 INT'L J. ENV'T RSCH. PUB. HEALTH 4613 (2021); Mike Trott et al., *Changes and Correlates of Screen Time in Adults and Children During the COVID-19 Pandemic: A Systematic Review and Meta-analysis*, 48 ECLINICALMEDICINE 101452, 1 (May 20, 2022), <https://www.thelancet.com/action/showPdf?pii=S2589-5370%2822%2900182-1>. It should be noted that studies' results varied depending also on when the data was collected, whether it was during initial lockdown periods or later. See also *Two Years into the Pandemic, Media Use has Increased 17% Among Tweens and Teens*, COMMON SENSE MEDIA (Mar. 23, 2022), <https://www.commonsensemedia.org/press-releases/two-years-into-the-pandemic-media-use-has-increased-17-among-tweens-and-teens> (pointing to significant increase in screen time among tweens and teens during the pandemic).

example, one study showed that the percentage of kids of all ages spending more than four hours daily on screens nearly doubled, including toddlers and children younger than ten.⁵³ Another study found that the screen time of twelve- to thirteen-year-old kids went up from 3.8 hours before the pandemic to 7.7 hours.⁵⁴

Even during the early lockdown phases of the pandemic, when technology provided some semblance of normalcy, only twenty-five percent of Americans surveyed believed that virtual communication effectively replaced in-person communications. Many people felt that online meetings were a diluted substitute for face-to-face interactions.⁵⁵ Moreover, spending more extended periods than ever on screens and online carried hard-to-ignore costs. Adults and kids reported fatigue and exhaustion as they stared at screens for many hours. Experts explained that one source of the exhaustion was our usual reliance on non-verbal cues like eye contact or body language, which are harder to decipher on screen.⁵⁶ While, long before the pandemic, online classes flourished in higher education, students resisted when many schools and universities resorted to virtual education as the primary option during the first year of the pandemic. A significant number of students deferred

⁵³ Shelagh Dolan, *Electronic Device Usage Nearly Doubled Among US Kids During the Pandemic*, INSIDER INTELLIGENCE, (Nov. 5, 2020), <https://www.emarketer.com/content/electronic-device-usage-nearly-doubled-among-us-kids-during-pandemic>.

⁵⁴ Jess Berthold, *Adolescents' Recreational Screen Time Doubled During Pandemic, Affecting Mental Health*, U.C.S.F., (Nov. 1, 2021), <https://www.ucsf.edu/news/2021/11/421701/adolescents-recreational-screen-time-doubled-during-pandemic-affecting-mental>; Jason M. Nagata et al., *Screen Time Use Among US Adolescents During the COVID-19 Pandemic*, 176 JAMA PEDIATRICS 94 (2022), <https://jamanetwork.com/journals/jamapediatrics/fullarticle/2785686>.

⁵⁵ Monica Anderson & Emily A. Vogels, *Americans Turn to Technology During COVID-19 Outbreak, Say an Outage Would Be a Problem*, PEW RSCH. CTR. (Mar. 31, 2020), <https://www.pewresearch.org/fact-tank/2020/03/31/americans-turn-to-technology-during-covid-19-outbreak-say-an-outage-would-be-a-problem/>.

⁵⁶ Julia Sklar, *'Zoom Fatigue' is Taxing the Brain. Here's Why that Happens.*, NAT'L GEOGRAPHIC (Apr. 24, 2020), <https://www.nationalgeographic.com/science/2020/04/coronavirus-zoom-fatigue-is-taxing-the-brain-here-is-why-that-happens/> (finding that forty percent of all users complain of screen fatigue). *But see* Ruth Igielnik, *As Telework Continues for Many U.S. Workers, No Sign of Widespread 'Zoom Fatigue'*, PEW RSCH. CTR. (May 4, 2022), <https://www.pewresearch.org/fact-tank/2022/05/04/as-telework-continues-for-many-u-s-workers-no-sign-of-widespread-zoom-fatigue/> (a 2022 survey finding that about twenty-five percent of regular telecommuters complained of screen fatigue compared to thirty-seven percent of regular telecommuters on October 2020).

starting college for a year. Students objected to losing the in-person class experience and felt lonely without their classmates. Educators and students alike realized that the education experience is impoverished without live classrooms. Teachers complained about the repetitive drudgery and unnatural experience of speaking to a silent computer screen, unable to know if a joke was well-received or if students understood the materials.⁵⁷

The pandemic intensified the technology overuse problem. Time on screens greatly increased and enveloped practically every aspect of life for adults and kids. Instead of going to work and school, screens became the window into the outside world. On the other hand, the escalation of the overuse problem and its costs highlighted the problem. If before the pandemic mostly parents worried about technology overuse and its impact on their families, during the pandemic many adults realized as well how excessive screen time affected them and tried to cut down.⁵⁸ The pandemic underscored the limitations of online communications. It made screen time visible. Screens initially crept in stealthily. Many did not pay attention to the time they spent on screens and how it affected them. But the pandemic changed it. It made people notice their screens, how they used them, and how they made them feel. Screens were no longer invisible.

Now that screens are visible, the window has reopened. As a society, there is an opportunity to make different choices—from what seemed like an inevitable trajectory toward more screen time and less in-person contact. Reshaping a technology and its use does not mean extinguishing it. It does not entail returning to a screenless and unconnected world. It means searching for a better balance between online and offline pursuits. Now that the technology is visible, society can finally make an autonomous reflective choice about what this balance should look like.

B. A Shift in the Science Wars

⁵⁷ Ryan N. Gajarawala, Opinion, *Better Late than Zoom*, HARV. CRIMSON (Apr. 21, 2020), <https://www.thecrimson.com/article/2020/4/21/editorial-better-late-than-zoom/>; R. H. Lossin & Andy Battle, *Resisting Distance Learning*, BOS. REV. (Apr. 30, 2020), https://www.bostonreview.net/forum_response/resisting-distance-learning/.

⁵⁸ Thirty-three percent of adults said they tried to cut down the time they spent on the Internet and cell phone during the pandemic. McClain et al., *supra* note 51. *See also* Saad, *supra* note 1.

Data about the harms of screens, particularly for children, started accumulating before the pandemic. But an approach of wait-and-see prevailed. However, coincidentally since 2020, significant study findings supplemented by brain imaging data—and the testimony of whistleblowers from Silicon Valley—underscored the need and opportunity to act.⁵⁹

Researchers identified associations between increased screen time and detrimental effects on kids. Specifically, cognitive and developmental delays; a rise in depression, anxiety, and suicide rates; increased impulsivity; attention difficulties; addiction; obesity; and lack of sleep.⁶⁰ The findings about screen time and kids' development and mental health raised particular red flags. Psychology studies found a correlation between excessive screen time and impaired cognitive development. The research showed that excessive screen time leads to developmental issues.⁶¹ Brain imaging research supplemented these findings. The brain scans examined the organization and myelination of white matter tracts, which influence nerve cells' ability to transmit information faster and affect cognitive functioning. The researchers compared scans of areas in the brain related to learning in children exposed to high screen time with those of children who were not. They found stark differences in white matter organization, which linked to performance on cognitive assessments.⁶²

⁵⁹ For a comprehensive overview of studies researching the impact of screens, see BERNSTEIN, *supra* note 4 at 16–32. For early findings, see generally NICHOLAS KARDARAS, GLOW KIDS: HOW SCREEN ADDICTION IS HIJACKING OUR KIDS - AND HOW TO BREAK THE TRANCE 14 (2016).

⁶⁰ For a general overview, see Gadi Lissak, *Adverse Physiological and Psychological Effects of Screen Time on Children and Adolescents: Literature Review and Case Study*, 164 ENV'T RSCH. 149 (2018). For attention, see, Ra Chaelin K. Cho et al., *Association of Digital Media Use with Subsequent Symptoms of Attention-Deficit/Hyperactivity Disorder Among Adolescents*, 320 JAMA PEDIATRICS 255 (2018) (finding an association between media digital use and ADHD symptoms in a longitudinal study). For sleep, see Lauren Hale & Stanford Guan, *Screen Time and Sleep Among School-Aged Children and Adolescents: A Systematic Literature Review*, 21 SLEEP MED. REV. 50 (2015). For impulsivity, see Michelle D. Guerrero et al., *24-Hour Movement Behaviors and Impulsivity*, 144 PEDIATRICS 1673 (2019).

⁶¹ The findings did not indicate that developmental issues make parents more likely to increase screen time exposure. Sheri Madigan et al., *Association Between Screen Time and Children's Performance on a Developmental Screening Test*, 173 JAMA PEDIATRICS 244 (2019).

⁶² John S. Hutton et al., *Associations Between Screen-Based Media Use and Brain White Matter Integrity in Preschool-Aged Children*, 174 JAMA PEDIATRICS 1 (2020); Tzipi Horowitz-Kraus & John S. Hutton, *Brain Connectivity in Children is Increased by the Time They Spend Reading Books and Decreased by the Length*

Another particularly concerning body of research highlighted the connection between social media and mental health, especially for girls.⁶³ Data showed that since 2012 there has been significant increases in the rates of girls' anxiety, depression, self-harm, and suicide. This timing coincides with the widespread adoption of social networks and smartphones.⁶⁴ Psychology studies and information leaking from social media companies underscored that the timing was not coincidental. Frances Haugen, the Facebook whistleblower, reported that Meta's internal data revealed the connection between the use of Instagram and girls' deteriorated mental health, yet Meta chose to ignore the data.⁶⁵

Finally, another concerning set of findings focused on individuals who spent excessive time on online games. Some gamers (one to nine percent of gamers, depending on the study),

of Exposure to Screen-Based Media, 107 ACTA PAEDIATRICA 685 (2018); Hongmei Wang et al., *The Alteration of Gray Matter Volume and Cognitive Control in Adolescents with Internet Gaming Disorder*, 9 FRONTIERS BEHAV. NEUROSCIENCE 1 (2015); Martin P. Paulus et al., *Screen Media Activity and Brain Structure in Youth: Evidence for Diverse Structural Correlation Networks from the ABCD Study*, 185 NEUROIMAGE 140 (2019).

⁶³ Jonathan Haidt & Jean Twenge, *Social Media Use and Mental Health: A Review*, (unpublished manuscript) (on file at tinyurl.com/SocialMediaMentalHealthReview). See also Yvonne Kelly et al., *Social Media Use and Adolescent Mental Health: Findings from the UK Millennium Cohort Study*, 6 ECLINICALMEDICINE 59 (2019); Jean M. Twenge & Eric Farley, *Not All Screen Time is Created Equal: Associations with Mental Health Vary by Activity and Gender*, 56 SOC. PSYCHIATRY PSYCHIATRIC EPIDEMIOLOGY 207 (2021).

⁶⁴ See Jonathan Haidt & Jean Twenge, *Is There an Increase in Adolescent Mood Disorders, Self-Harm, and Suicide Since 2010 in the USA and UK? A Review* (unpublished manuscript) (on file with N.Y.U.); Ramin Mojtabai et al., *National Trends in the Prevalence and Treatment of Depression in Adolescents and Young Adults*, 138 PEDIATRICS 1 (2016); Jean M. Twenge et al., *Age, Period, and Cohort Trends in Mood Disorder Indicators and Suicide-Related Outcomes in a Nationally Representative Dataset, 2005–2017*, 128 J. OF ABNORMAL PSYCH. 185 (2019); Katherine M. Keyes et al., *Recent Increases in Depressive Symptoms Among US Adolescents: Trends from 1991 to 2018*, 54 SOC. PSYCHIATRY AND PSYCHIATRIC EPIDEMIOLOGY 987 (2019); Melissa C. Mercado et al., *Trends in Emergency Department Visits for Nonfatal Self-inflicted Injuries Among Youth Aged 10 to 24 Years in the United States, 2001–2015*, 318 JAMA 1931 (2017).

⁶⁵ Melissa Hunt et al., *No More FOMO: Limiting Social Media Decreases Loneliness and Depression*, 37 J. SOC. AND CLINICAL PSYCH. 751 (2018); Georgia Wells et al., *Facebook Knows Instagram Is Toxic for Teen Girls, Company Documents Show*, WALL ST. J. (Sept. 14, 2021), <https://www.wsj.com/articles/facebook-knows-instagram-is-toxic-for-teen-girls-company-documents-show-11631620739>.

mostly males, were diagnosed with Gaming Disorder – an addiction to online games, classified as a disorder by the World Health Organization.⁶⁶ The lives of these individuals would revolve around their online game of choice. Studies showed that not only did they spend most of their time playing and neglecting other life activities, but this diagnosis was associated with increased risks of depression, anxiety, and ADHD.⁶⁷ Moreover, brain imaging of individuals diagnosed with Gaming Disorder indicated changes in the regions of their brains that are associated with addiction, rewards, and emotional processing when compared to scans of a control group.⁶⁸

CONCLUSION

This Article contributed to law and technology theory by identifying factors that can affect the closing and opening of

⁶⁶ Douglas A. Gentile et al., *Internet Gaming Disorder in Children and Adolescents*, 104 PEDIATRICS S81 (2017) (finding that IGD prevalence rates range between around one percent and nine percent, depending on age and country); Andrew K. Przybylski AK et al., *Internet Gaming Disorder: Investigating the Clinical Relevance of a New Phenomenon*, 174 AM. J. PSYCHIATRY 230 (2017); Christopher J. Ferguson & John Colwell, *Lack of Consensus Among Scholars on the Issue of Video Game “Addiction,”* 9 PSYCH. POPULAR MEDIA 359 (2020); Alan Mozes, *1 in 20 College Students Has ‘Internet Gaming Disorder,’ Study Finds*, U.S. NEWS (July 7, 2021), <https://www.usnews.com/news/health-news/articles/2021-07-07/1-in-20-college-students-has-internet-gaming-disorder-study-finds>.

⁶⁷ The 11th Revision of the International Classification of Diseases (ICD-11) was released in 2018. *Inclusion of “Gaming Disorder” in ICD-11*, WORLD HEALTH ORG. (Sept. 14, 2018), <https://www.who.int/news/item/14-09-2018-inclusion-of-gaming-disorder-in-icd-11>; Rashmi Parmar & Julian Lagoy, *Is Video Game Addiction a Disorder?* PSYCHIATRIC TIMES, (Oct. 4, 2021), <https://www.psychiatrictimes.com/view/is-video-game-addiction-a-disorder>; Sarah M. Coyne et al., *Pathological Video Game Symptoms from Adolescence to Emerging Adulthood: A 6-Year Longitudinal Study of Trajectories, Predictors, and Outcomes*, 56 DEV. PSYCH. 1385 (2020); Laura Stockdale & Sarah M. Coyne, *Video Game Addiction in Emerging Adulthood: Cross-Sectional Evidence of Pathology in Video Game Addicts as Compared to Matched Healthy Controls*, 225 J. AFFECTIVE DISORDERS 265 (2018); Cecilie Schou Andreassen et al., *The Relationship Between Addictive Use of Social Media and Video Games and Symptoms of Psychiatric Disorders: A Large-Scale Cross-Sectional Study*, 30 PSYCH. ADDICTIVE BEHAV. 252 (2016). Research results are inconclusive on whether there is an association with increased aggression. See Craig A. Anderson & Karen E. Dill, *Video Games and Aggressive Thoughts, Feelings, and Behavior in the Laboratory and in Life*, 78 J. PERSONALITY SOC. PSYCH. 772 (2018); Andrew K. Przybylski & Netta Weinstein, *Violent Video Game Engagement is Not Associated with Adolescents’ Aggressive Behaviour: Evidence from a Registered Report*, 6 ROYAL SOC’Y OPEN SCI. 171474 (2019);

⁶⁸ Daria J. Kuss & Mark D. Griffiths, *Internet and Gaming Addiction: A Systematic Literature Review of Neuroimaging Studies*, 2 BRAIN SCI. 327 (2012).

windows of opportunity to regulate new technologies. These include: the invisibility of the technology, rapid entrenchment of social norms and business interests, a regulatory preference not to intervene early but adopt a wait-and-see approach, and the occurrence of a mega-historical event that shakes up practices surrounding the technology.

The Article looked closely at the historical trajectory of technology overuse. First, it highlighted the technological invisibility of manipulative designs, which prevented users from participating in a process of interpretive flexibility to determine how much time they spend on screens. Second, it underscored U.S. regulators' preference to shy away from early intervention, particularly early regulation of the Internet. Third, it pointed to the rapid entrenchment of online companies' business interests to maximize time online and the quick solidification of social norms relying on screens in most areas of life, which prevented change even when the public became increasingly aware of the technology overuse problem. Finally, the Article argued that the Covid-19 pandemic, which exacerbated the technology overuse problem, created a window of opportunity for its resolution by creating a better online-offline balance.