

Chapter 5

The Smartphone: A Weapon of Mass Distraction

Life is what happens when your smartphone is charging.

Unknown

There's constant pressure to be plugged in 24/7 and it's causing serious health problems. I'm glad to see that companies in the smartphone industry are taking strides to combat problems. But giving people the ability to limit their own usage with programs like Screen Time isn't enough. It's the equivalent of telling an alcoholic to lock their liquor cabinet but letting them keep the key.

Brian Scudamore, *Forbes Magazine*

Our New Digital Appendage

The meteoric growth in use of the multifunctional smartphone in the last few years has been a significant global success story for the digital tech industry. These devices have significantly changed the communications and information landscape and promoted new forms of social status and identity by remoulding the interests, values and desires of many mobile device users. Smartphones are now not only mobile phones for making and taking voice calls, but they are handheld personal computers and represent the most recent step in the evolution of small, portable information and communication devices. They are fortified with always-on network connectivity and, consequently, have all the internet's appealing but also problematic content. They enable the installation of an extensive range of software applications and are creating new forms of information, communications, education and entertainment, while promoting new habits of use for many individuals. Other features of smartphones include touchscreens, media players,

**The Social, Cultural and Environmental Costs of Hyper-Connectivity:
Sleeping Through the Revolution, 71–84**



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digital cameras and GPS-based navigation, to name a few. Generally, therefore, the smartphone distinguishes itself from the standard traditional mobile or cell phone by running an open operating system that hosts applications, which greatly expand the phone's functionality giving it these computer-like capabilities. The smartphone has introduced some incredible additional functionality to our lives allowing us to organise our day and stay constantly connected to family and friends, regardless of the time or location. But there is now also constant pressure to stay connected seven days a week, 24 hours a day, and this is leading to societal risk and personal misgivings and damaging health issues for some individuals. There is a time and place to use our mobile devices, but also a time and place to put them away. Humans, by our nature, are prone to distraction, and smartphones are designed to feed our seemingly endless and insatiable appetite for entrainment, trivia, news headlines as well as cater to our desires to express ourselves on social media platforms. In this chapter, the focus of our attention will be on the smartphone; its history, its development, its acceptance and adoption and its now revered position as a contemporary symbol of social status. But also its hidden dangers and the darker sides to hyperconnectivity and distraction that these devices have come to epitomise in the contemporary digital age.

A Brief History of the Mobile Phones

The development and history of the modern smartphone, as we know it, began in the early 1990s and has evolved significantly since its early inception and form as a mobile cellular device. What were once bulky 'brick-like' objects, the mobile cellular phone has evolved into a small, compact, portable omnipresent devices of mass communication. The history of mobile phones is the history of mobile communication devices that first connected wirelessly to the public switch telephone network. While knowledge of the transmission of speech by radio signal goes back many years,¹ the more recent development of the first automatic analog cellular systems (1G) deployed were The Nippon Telegraph and Telephone Corporation (NTT) systems first used in Tokyo in 1979 – later spreading to the whole of Japan – and Nordic Mobile Telephony (NMT) in the Nordic countries of Europe in the early 1980s. In the 1990s, the second-generation mobile cellular phones were developed using the global system for mobile communications (GSM) standard in Europe and the code-division multiple access (CDMA) standard in the United States. This second-generation technology differed by using digital instead of analog transmission and fast out-of-band phone-to-network signalling. The growth in mobile phone usage as a result of 2G technology was

¹These early mobile phones are often referred to as 0G mobile phones or zero-generation mobile phones. The first ever mobile telephone call was made on 3 April 1973 on a Motorola DynaTAC8000X. The call was made by Martin Cooper of Motorola; the recipient was Dr Joel S. Engel of Bell Laboratories. The DynaTAC8000X became the first commercially available mobile phone. It did not go on sale, however, until 1983 and carried a considerable hefty price tag of about \$4,000.

extraordinary, and this heralded the advent of prepaid mobile phone services. The introduction of 2G systems also prompted moves away from the larger brick-like phones towards smaller and lightweight handheld devices. This transition was possible not only through technological improvements – such as more advanced batteries and more energy-efficient electronics – but also because of the higher density of cell sites² that began to dot the urban and rural landscapes to accommodate increasing usage. The latter meant that the average distance transmission from the mobile phone to the base station shortened, leading to increased phone battery life while on the move.

Touchscreens are now a standard part of everyday smartphone use and the first iteration of a touchscreen handset was introduced as far back as 1994. The IBM Simon is sometimes referred to as the first ever smartphone; it could receive and send email and faxes and had several other additions such as a calendar, address book, clock and notebook, features we now view as standard on any smartphones. This mobile device was only available in America and needed to be operated with a stylus rather than a person's fingers and also incorporated a QWERTY keyboard as standard. Despite its unique and functional features, IBM Simon spent a mere six months on the market selling just around 50,000 units; its demise prompted by its very short battery life – it lasted around one hour – and the emergence of exciting competitors such as flip phones.³ One of the fundamental drawbacks with the IBM Simon phone was it operated as an analog communication device that was subject to the same interference problems and spotty coverage outside the main urban areas that other analog cellular phones experienced at that time. The next-generation smartphone would use 2G technology, with speedier digital network connections, smaller dimensions, more advanced features, and it was in Europe that they would first emerge.⁴

While the pre-smartphone era was largely spearheaded by developments in the United States, by the late 1980s, European countries had agreed to adopt the GSM standard for their 2G networks, which quickly became the de facto global standard. European standardisation greatly helped Sweden's Ericsson and Finland's Nokia companies establish an early lead over Motorola in the 2G cell phone and smartphone market. The GSM standard had been adopted worldwide, and this enabled these companies achieve high-volume international sales to the point that by the mid-1990s, nearly one out of every three Finns and Swedes owned a cell phone, which was more than twice that for Americans and the rest of Europe.⁵ Both of these companies led the development of forerunners to the smartphone, with varying degrees of success, with devices such as The Communicator and the R380.

²In Global System for Mobile Communications (GSM) networks, the correct term is Base Transceiver Station (BTS), and colloquial synonyms are 'mobile phone mast' or 'base station'. They are cellular-enabled mobile device sites where antennas and electronic communications equipment are located to create a cell in a cellular network.

³Aamoth, D. (2014). First smartphone turns 20: Fun facts about Simon. *Time*, August 18. Retrieved from <https://time.com/3137005/first-smartphone-ibm-simon/>

⁴Woyke (2014).

⁵Woyke (2014, p. 11).

With the establishment of Palm Computing in 1992 – led by Jeff Hawkins – the United States had re-entered the smartphone developmental field as a serious player. After a number of initial setbacks, the company took a giant stride forward with the launch of the Pilot 1000 and 5000. These were the first Personal Device Assistant (PDA) Palms designed to support large data transfers; both had 4.7-inch screens that let users access addresses, set-up and view appointments, to-do lists and memos, and the screen also had a touch-sensitive panel that was activated by means of a pen-like stylus and a handwritten recognition system called Graffiti.⁶ These devices were also smaller, lighter, easier to use and cheaper than previous devices but, critically, did not include actual phone functionality. Hawkins quickly realised that such stand-alone PDA devices were on a direct collision course with the cell phone for the long-term future and viability of mobile communications and computing. Palm Computing was subsequently acquired by US Robotics and then 3Com leading to the departure of Hawkins from the company. Soon after leaving, he set-up Handspring with several other former Palm directors and employees.

Near the end of the millennium, Handspring launched its first iteration of a smartphone. Having first brought Visors to the marketplace as a PDA, a short time after the company introduced a new VisorPhone cartridge to allow the device to make and receive calls. Users could now browse the web and send and receive emails as the VisorPhone also doubled as a wireless modem, but reviews of the new mobile communication device were initially lukewarm. In 2002, a smartphone appeared with a completely different lineage: the Blackberry. Sometimes called 2.5G, the Blackberry used General Packet Radio Service (GPRS) technology that carriers laid on top of their GSM networks to enable faster data rates and which divided files into smaller packets that enabled more effective transmissions.⁷ Such a set-up and design also enabled users to stay online and connect without the hassle of dialling up an internet connection; all features that inspired a level of user devotion that no other cell phone or smartphone had been previously been able to achieve. The Blackberry quickly captured the market. At its peak in 2013, there were some 76 million subscribers worldwide,⁸ and critical to the company's early success were its efforts to position the Blackberry as a device and platform for business and enterprise.

During these years of Blackberry's success, in 2007 at a heavily hyped press event at the Macworld Convention in San Francisco Apple co-founder Steve Jobs unveiled the iPhone, a revolutionary new product that not only broke the mould but was also to set an entirely new paradigm for computer-based mobile communications. The iPhone's user interface is built around a multi-touchscreen with a virtual keyboard. It connects to cellular networks or Wi-Fi, can receive and make

⁶Woyke (2014, p. 17).

⁷Woyke (2014, pp. 20-21).

⁸Epstein, Z. (2013). Blackberry lost 4 million subscribers in Q1 despite new launches. *BGR*, June 28. Retrieved from <https://bgr.com/2013/06/28/blackberry-subscribers-q1-2014/amp/>

calls, users can browse the web, take pictures, play music and send and receive emails and text messages and since its launch has been credited with popularising the smartphone while generating massive profits for the Apple corporation. The company's approach was to deliberately simplify its product line by offering just one model a year while also making it an expensive high-end but exceptionally desirable product. Around about the same time, Google was acquiring Android Inc., which had begun life as a company developing operating systems for digital cameras. Once they recognised that such a market was limited, developers at Android quickly turned their attention to handset operating systems that would rival Symbian and the Microsoft Windows Mobile.⁹ Google were keen to enter the mobile communications market and expand their organisational reach. An early Android prototype closely resembled the Blackberry with a physical QWERTY keyboard, but the arrival of the iPhone in 2007 sent developers back to the drawing board. Blackberry and Nokia had by now begun to focus on touch-based phone development to rival the iPhone. Android's attention also switched in that direction and the first commercially available smartphone running the Android operating system was launched in 2008: the HTC Dream. Growth and sales in smartphones took off from that point and as the Blackberry and other developers fell by the wayside, the marketplace quickly became dominated by Apple and Google over time. Android has now been the best-selling operating system for smartphones worldwide since 2011 with nearly 2 billion monthly active users and the Google Play Store hosting over 2.9 million apps. The number of smartphone users worldwide today has now surpassed 3 billion, and the market is forecast to further grow by several hundred million in the next few years.¹⁰ China, India and the United States are the countries with the highest number of smartphone users, with each country surpassing the 100 million user mark. Smartphones have, without doubt, become a global phenomenon over the last decade, but what are the reasons for their spectacular rise, and are there consequences attached to their widespread adoption and use?

Attraction and Distraction

With so many smartphone users across the world now what is the main attraction of such devices? In many ways, their main appeal is their ability to keep users connected 24/7 with whomever they choose to be associated with. Smartphones also afford the capability of always-on internet access – with the vast stores of information this entails – as well as practical applications that allow an individual's emails and social media accounts be readily accessible through easy-to-use

⁹Welch, C. (2013). Before it took over smartphones, Android was originally destined for cameras. *The Verge*, April 16. Retrieved from <https://www.theverge.com/2013/4/16/4230468/android-originally-designed-for-cameras-before-smartphones>

¹⁰O'Dea, S. (2020). Smartphone users worldwide 2016-2021. *Statista*, February 28. Retrieved from <https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/>

touchscreens. The ability to remain constantly connected to family and friends, and the workplace, now resides in a small, portable, lightweight communication device that fits in our pockets. But because the smartphone phenomenon is only a few years old, we really do not truly know what the long-term effects of this new always-connected, always-contactable regime may be having on individuals, our well-being and our relationships. For many people, the smartphone is the last thing they see at night before they fall sleep, and the first thing they see in the morning when they wake. Research from the United States reveals that Americans touch their mobile devices more than 2,600 times a day on average.¹¹ For the heaviest users – the top 10 per cent – average interactions almost doubled to 5,427 touches a day. The average user engages in 76 separate phone sessions a day; heavy users average 132 sessions a day. Are all these highly concentrated, highly tactile interactions with our smartphones good or bad for us? The answer is we really do not know yet.

What is obvious, however, is that our smartphones are distracting us from other important incidences and events in our lives. Being mesmerised and anything other than being ‘in the moment’ with your smartphone has become the norm for many and has fashioned the contemporary term ‘nomophobia’.¹² While many levels of smartphone-enabled interruptions may be deemed trivial in nature, in other instances, this level of distraction can be lethal. Fatalities caused by road crashes are considered a major concern for both lives lost and the social costs of such loss, and crashes triggered by distracted driving are now a major cause of mortality on our roads and of growing concern. As far back as the beginning of the decade the World Health Organization (WHO) established that mobile phone use was one of the main contributors to this driver distraction.¹³ The *2018 Distracted Driving Report* found that as smartphone ownership increased across an ever-growing mobile workforce in the United States, there has also been a disturbing parallel in rising road accident rates.¹⁴ Specifically, the report found that as smartphone ownership skyrocketed from 55 per cent in 2013 to 77 per cent in 2017, the number of accidents escalated from 5.7 million to 6.4 million, an increase of 12 per cent. While many accidents will not capture the true extend of smartphone distraction – remember, in most countries, it is illegal to use your

¹¹Winnick, M. (2016). Putting a finger on our phone obsession - Mobile touches: A study on how humans use technology. *Dscout*, June 16. Retrieved from <https://blog.dscout.com/mobile-touches>

¹²NO MOBILE PHOne phobia (Nomophobia) is a twenty-first-century term used to describe a psychological condition when people have a fear of being detached from mobile phone connectivity. Nomophobia is not listed in the latest edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) as mental health experts have not yet decided on formal diagnostic criteria for this condition. However, it’s generally agreed that nomophobia presents a growing concern to people’s mental health with some experts suggesting it represents a type of phone dependence or addiction.

¹³World Health Organization (2011).

¹⁴2018 Distracted driving report. (2018). *Motus*. Retrieved from <https://resources.motus.com/reports/2018-distracted-driving-report>

mobile phone or device when driving, and motorists are reluctant to state the cause of any accident was down to their absent mindedness because they were on their phone – it can be said that the financial costs of smartphone-related distraction, although somewhat difficult to quantify, are growing. One way of trying to establish such costs is to look at insurance companies and their premiums. The report showed a steady increase in auto collision claim frequency, and between 2014 and 2016, there were substantial spikes in both smartphone ownership and car accidents that involved property damage, injuries or fatalities. A 2010 study by the Pew Research Center said nearly half of US adults admit reading or sending a text message while driving.¹⁵ Millennials are the worst offenders, according to this research. Fifty-nine per cent of people between the ages of 18 and 33 years reported texting while driving, compared with 50 per cent of Gen Xers – aged between 34 and 45 years – and only 29 per cent of baby boomers.

Although now a decade old, there is no indication that such behaviour has changed for the better, and every indication that it has gotten worse as the functionality and use of the smartphone has increased. A ticket for using a mobile phone while driving added some \$226 to the average insurance policy for US drivers – an increase of 16 per cent – again an indication of the insurance industry’s recognition of the growing problem of driver smartphone distraction and accident rates.¹⁶ Such concerns are not only confined to the United States. The relationship between smartphone use and road fatalities was found to be strong in a 2018 population-based case-crossover Italian study.¹⁷ Data on road crashes with fatalities were collected from seven Italian metropolitan areas and matched in time and space with high-resolution mobile phone traffic volume data on voice calls, text messages, internet connections and the upload or download of data. Positive associations between road crash rates and mobile phone activity were found. Working days, night-time and morning hours were associated with greater smartphone use and more road accidents. But distraction when driving is nothing new. It had been known for some time that drivers have been eating, grooming themselves, changing radio station and chatting with passengers while driving. However, the current omnipresent use of smartphones while driving has caused a significant paradigm shift; the migration from traditional cell phone to smartphone creates an additional and long-term visual screen distraction and has significantly multiplied the occurrence of distracted driving. So why are our smartphones so distracting and so difficult to put down, and why do we feel the need to rush to see what the latest ping from our phone is associated with?

Addiction as a Design Feature

The Center for Human Technology was launched in 2018 by a former Design Ethicist at Google, Tristan Harris, who had become troubled by what he observed

¹⁵Madden and Rainie (2010).

¹⁶Motus (2018).

¹⁷Gariazzo, Stafoggia, Bruzzone, Pelliccioni, and Forastiere (2018).

as the large-scale negative impacts of the attention-grabbing business models adopted by smartphone developers and social media companies.¹⁸ Five years earlier, Harris had sent around a presentation built with Google Slides to 10 or so friends inside the company titled *A Call to Minimize Distraction and Respect Users' Attention*, which called on Google to help people spend less time looking at their screens. As the co-founder of Time Well Spent, a non-profit advocacy group focussed on the ethics of consumer technology, Harris set about trying to bring moral integrity to software design, essentially to persuade the tech world to help people disengage more easily from their devices. In an interview for *The Atlantic*, Harris suggested that the smartphone was so addictive, and designed that way, that he called it 'a slot machine in my pocket'.¹⁹ He argued that the most successful websites and smartphone apps hook us by tapping into deep-seated human needs for approval and to be liked. Using approaches originating in the psychology of behavioural change at the Persuasive Technology Lab at Stanford University – run by the experimental psychologist B. J. Fogg – many developers have adopted Fogg's principles of 'behaviour design', a euphemism for what sometimes amounts to building software that nudges us towards the habits a company seeks to instil in its users. This is why our smartphone apps reward us with instantaneous approval after we post a photo; this reinforces the action and potentially shifts it from an occasional to a daily or hourly, or more frequent, activity. Harris suggests that technology is not, as so many engineers and developers claim, a neutral tool. Rather, it's designed and developed to be capable of coaxing us to act in certain ways. He came to conceive smartphone software developers as using 'hijacking techniques' – the digital version of pumping sugar, salt and fat into junk food in order to induce binge eating. Just as junk foods hook us by appealing to our bodies' cravings for particular foods or flavours, our smartphone apps hook us by delivering what psychologists call 'variable rewards'.

Have you, for example, ever felt what's known as 'phantom vibrations' from your smartphone: that sensation where your body is sure it's detected a new call, message or update tinkle, but you check and there's nothing new there? That strange and disconcerting sensation is caused by the state of hyper-vigilance smartphone users find themselves in from time to time. We are becoming hooked to both the dopamine hits of satisfaction that our smartphones give us hundreds of times a day, while being simultaneously assailed by dangerous levels of cortisol these then send coursing through our bodies. Dopamine is a chemical produced by our brains that plays a central role in motivating behaviours. It gets released when we take a bite of delicious food, after we exercise and, importantly, when

¹⁸The Center for Humane Technology is an independent non-profit organisation supported by a growing movement of cross-disciplinary leaders in technology, humanity, mindfulness, philosophy and education: see <https://humanetech.com/>.

¹⁹Bosker, B. (2016). The binge breaker: Tristan Harris believes Silicon Valley is addicting us to our phones. He's determined to make it stop. *The Atlantic*, November. Retrieved from <https://www.theatlantic.com/magazine/archive/2016/11/the-binge-breaker/501122/>

we have positive or joyful social interactions. Cortisol works with adrenaline to create memories of short-term emotional events. However, long-term exposure to cortisol damages cells in the hippocampus,²⁰ and this damage results in impaired learning. It is argued that this assault on our systems by smartphones is affecting everything from the way we sleep to our attention span, our memory, our self-esteem, decision-making skills and our overall physical health.²¹ This is, of course, closely related to debates in the previous chapter in which the way digitalisation is challenging our basic cognitive skills and affecting our overall mental well-being were discussed. Our many apps, and smartphones themselves, are designed to be habit forming; they are designed to trigger happy chemicals in our brains, much the same way poker machines do and thus make us want to keep checking them endlessly. The calculated and strategic use of colour in the design of apps is also a significant psychological factor in the addictive nature of smartphones. Colour can be used to make people feel and think emotionally differently at different times.²² Our eyes tend to gravitate towards bright, warm colours, such as reds. As smartphones have evolved, many app developers have redesigned their logos to incorporate these colours into their design processes, with bright yellows, oranges, reds and purples some notable examples. Colour can also be used to create visual stress; when you open your smartphone and see the bright red bubble in the corners of an app or the screen, it makes it much harder to resist checking for the latest messages and updates.

In *The Smartphone Paradox*, Alan Reid suggests that our love affair with smartphones have catapulted us towards a technological crescendo where humanity is collectively transformed in both positive and negative ways.²³ Through the lens of smartphone dependency, Reid's work makes the strong argument for digital mindfulness in a device age that threatens our privacy, sociability, attention and cognitive abilities. He found that many smartphone users are critically self-aware of their technological habits, and yet they grapple internally with what can be described as the 'smartphone paradox'; that their mobile device is simultaneously liberating yet controlling, unifying yet polarising.²⁴ This always-on, always-connected digital lifestyle that the smartphone accelerates leaves little room for other important things that we, as humans, need in order to develop and flourish. Some precious downtime, some time to think and contemplate, the real need for quiet time; this extremely important personal quiet time allows us to reflect on our day and make sense of our interactions and activities. Making the time to find

²⁰McAuley et al. (2009).

²¹Corby, S. (2019). The everyday device in your home killing hundreds around the globe. *The CEO Magazine*, September 25. Retrieved from <https://www.theceomagazine.com/business/innovation-technology/smartphones-killing-globe/>

²²Przybyła, D. (2017). The psychology of colors in marketing and branding. *Color Psychology*, April 28. Retrieved from <https://www.colorpsychology.org/color-psychology-marketing/>

²³Reid (2018).

²⁴Reid (2018, p. 1).

comfort in solitude and silence is often seen as an unaffordable luxury in a digital hyperconnected world, but such moments can be time for rest, rebalance and renewal, a time to (re)discover what is important for you in life, a time for mindfulness and a time to (re)discover our place in the universe. Writing for BankMyCell, Anya Pechko, founder of Project BE,²⁵ wrote about the need to live more authentic and connected lives by spending less time with our digital technology:

In my practice, I often talk about our cognitive and critical thinking being negatively impacted by technology. I am also a very very big proponent of boredom, I view boredom as our 6th sense. An internal entertainment system if you will, which we use to entertain ourselves and others. Its basic humanity. We now have outsourced this to our phones and so we depend on them to be entertained and stimulated. And of course, don't even get me started on the oxytocin vs dopamine. I also think that technology impacts generations in very different ways, right now I am concentrating on children. Since the cortex doesn't fully mature till 25 or so, their tiny brains are flooded with dopamine which early studies show is correlated to premature aging.²⁶

But we may genuinely ask the question; so smartphones are distracting and controlling at times, but is their use for some truly addictive behaviour?

Smartphone addiction, or digital dependency, is a term that is loosely used in popular discourse over the past few years, and the definition of smartphone dependency or addiction is a problematic term even to define now. The scientists trying to study this area are facing a number of medical, scientific and philosophical difficulties and questions. But smartphone addiction appears to be an issue of growing concerns to many, not least the tech sector itself. When Apple launched *Screen Time*, Google quickly responded by seeking to reposition itself as a force of 'digital wellness' by unveiling several artificial intelligence powered tools in the hope they would lessen the addictive nature of smartphone use. How committed they are to these projects has yet to be determined. But by reacting in this way – effectively attempting to persuade customers to reduce their use of the devices they produce and sell – is confirmation of the growing concern that addiction is becoming a significant problem that is impacting the industry's image. What is becoming more evident is that smartphone use has the potential to develop into an addictive behaviour, similar to gambling, which can significantly interfere and inhibit our daily routines and harm our sense of self-worth. In order to

²⁵Project BE raises awareness about the growing dangers of media influence and addiction and inspires users to shift their habits away from their devices to live happier, healthier lives: see <https://www.projectbe.com/>.

²⁶Turner, A. Smartphone addiction facts & phone usage statistics: The definitive guide (2019-2020 update). BankMyCell. Retrieved from <https://www.bankmycell.com/blog/smartphone-addiction/#chapter1>

make conscious choices, it is imperative that we have a deeper understanding of the impacts such digital devices and technology already have, and can have, on our practices and the effects on our well-being. Though not an official diagnosis, researchers have demonstrated how classic addiction symptomology may be applicable in the context of smartphone overuse including loss of control, preoccupation with the device, withdrawal symptoms and negative effects on our social and work lives.²⁷

There is a viewpoint that suggests it is not possible for an individual to be addicted to a smartphone because addiction requires there to be physical withdrawal symptoms, and some argue that you cannot get such physical symptoms from an activity. But studies have shown that the separation of a regular smartphone user from their device actually does result in negative physiological and mental effects such as increased anxiety, heart rate and blood pressure.²⁸ Moreover, in a systematic review of the literature, depression severity and anxiety difficulties were consistently related to problematic smartphone overuse.²⁹ While it must be recognised there is a spectrum of views as to the validity of smartphone addiction as a specific subsection of behavioural addiction, others point to whether such addiction is related specifically to the smartphone itself or if the device is simply the medium through which people access other addictions like gambling, shopping or the constant need to update their social media profiles and seeking online approval. Whether it's the medium or the actual applications used, over-attachment to our smartphones is causing some people personal and social problems, in some cases heightening feelings of loneliness and isolation while worsening anxiety and depression symptoms.³⁰ The behavioural addiction of smartphone overuse begins forming neurological connections in the brain in ways similar to how opioid addiction is experienced by people taking Oxycontin for pain relief: that is gradually. But in their research, Peper and Harvey note that digital addiction is not our fault but a result of the tech industry's desire to increase corporate profits. Push notifications, vibrations and other alerts on our smartphones and other mobile devices make us feel compelled to look at them by triggering the same neural pathways in our brains that once alerted us to imminent danger, such as an attack by a large predator. We are being hijacked by those same mechanisms that once protected us and allowed us to survive in the wild; this time often for the most trivial pieces of information or gossip.

Disturbingly, research has also linked an increase in the suicide rates in young people to the growth in the use of social media and smartphones.³¹ In two nationally representative surveys of US adolescents in grades 8–12 – with over 500,000 participants – and national statistics on suicide deaths for those between 13 and 18 years of age; adolescents' depressive symptoms, suicide-related outcomes

²⁷Kwon et al. (2013).

²⁸Clayton, Leshner, and Almond (2015).

²⁹Elhai, Dvorak, Levine, and Hall (2017).

³⁰Peper and Harvey (2018).

³¹Twenge, Joiner, Rogers, and Martin (2018).

and suicide rates increased between 2010 and 2015, especially among females. Adolescents who spent more time on new media, such as social media platforms and electronic devices such as smartphones, were more likely to report mental health issues, and adolescents who spent more time on non-screen activities such as in-person social interactions, sports, homework, print media and attending religious services were less likely. While the point is that we should all make more conscious, balanced decisions and choices as to how we allow digital technology affect us, the tech industry cannot simply wash their hands of their responsibility particularly when it can be shown that they specifically design addictive code and features into these devices.

The Human Cost of Our Smartphones

And what of the additional social and environmental costs of the smartphone, in particular the scarce resources that are needed for their development? While the environmental cost of the acquisition and mining of precious minerals and materials for the production of smartphones will be discussed in a later chapter, it is important to also investigate the social costs imposed upon some developing countries of producing smartphones for universal consumption. What level of ethical, social and environmental responsibility should smartphone manufacturers and developer have for how their products are designed, sourced, assembled and manufactured? Major electronics brands and smartphone manufactures – including Apple, Samsung and Sony – are failing to do even basic checks to ensure that cobalt mined by child labourers have not been used in their products, an Amnesty International and Afreewatch report uncovered.³² The report documents the hazardous conditions in which artisanal miners, including thousands of young children, mine cobalt in the Democratic Republic of the Congo (DRC). The report traces how this cobalt is used to power smartphones, laptop computers and other lightweight portable electronic devices. Using basic hand tools, miners dig out rocks from tunnels deep underground, and accidents are commonplace. Despite the potentially fatal health effects of prolonged exposure to cobalt, adult and child miners work without even the most basic of protective equipment such as gloves, overalls or facemasks. At least 80 artisanal miners died underground in southern DRC between September 2014 and December 2015 alone, but the true figure is unknown as many accidents go unrecorded and bodies are left buried in the rubble. In 2014, approximately 40,000 children worked in mines across southern DRC, many of them mining cobalt, according to UNICEF, working up to 12 hours a day deep in these mines. According to Emmanuel Umpula, Afreewatch (Africa Resources Watch) Executive Director:

It is a major paradox of the digital era that some of the world's richest, most innovative companies are able to market incredibly sophisticated devices without being required to show where they

³²Amnesty International and Afreewatch (2016).

source raw materials for their components. The abuses in mines remain out of sight and out of mind because in today's global marketplace consumers have no idea about the conditions at the mine, factory, and assembly line. We found that traders are buying cobalt without asking questions about how and where it was mined.³³

Researchers at the University of Lubumbashi in the DRC, as well as the universities of Leuven and Ghent in Belgium, studied the effects of the pollution caused by cobalt mines and linked it to birth defects like limb abnormalities and cleft palates.³⁴ In findings published in the *Lancet*, the study found that local people working in mines in the African 'copperbelt', a mining region stretching across Zambia and the DRC, are at significantly higher risk of having children born with serious birth defects. Cobalt mined in the DRC accounts for 60 per cent of global production of the mineral, which is essential to power rechargeable lithium batteries used in smartphones, adding to growing pressure on the multinationals who continue to source cobalt from the DRC to address the human rights, social and environmental abuses that have been uncovered in mines right across the region. While it is recognised that Chinese companies run many of the industrial mines in the territory, in 2020, a lawsuit was launched in the United States which accused the world's largest technology companies – Apple, Google, Dell, Microsoft and Tesla been named as defendants – of aiding and abetting in the deaths of children working in mines in the DRC.³⁵ While some of these named companies have reaffirmed their commitments to social justice and equality with regard to their supply chains and production of their smartphones, Amnesty International suggest none of them are making appropriate efforts to ensure that their riches are not being built on the backs of the oppressed women, men and children of the Congo who toil in putrid conditions, endure pitiful wages, grave injury and risk death to mine their cobalt.³⁶ Basic questions of responsibility and social justice directed at big tech continue to be trivialised or ignored, and the true social costs of our obsession with the smartphone will remain unknown until we begin to ask more probing questions of ourselves and the industry. One of these important questions relates to our own privacy and how digital technology, in general, can be used a means of mass surveillance and manipulation. Our personal data and information

³³Exposed: Child labour behind smartphone and electric car batteries. (2016). Amnesty International, January 19. Retrieved from <https://www.amnesty.org/en/latest/news/2016/01/Child-labour-behind-smart-phone-and-electric-car-batteries/>

³⁴Van Brusselen et al. (2020).

³⁵See 'Case 1:19-cv-03737, document 1, filed by Terrence Collingsworth, international rights advocates, Washington, DC', 15 December 2019. Retrieved from <http://iradvocates.org/sites/iradvocates.org/files/stamped%20-Complaint.pdf>.

³⁶Industry giants fail to tackle child labour allegations in cobalt battery supply chains. (2017). *Amnesty International*, November 15. Retrieved from <https://www.amnesty.org/en/latest/news/2017/11/industry-giants-fail-to-tackle-child-labour-allegations-in-cobalt-battery-supply-chains/>

is now highly prized and monetised by the tech sector and we are ignoring the perils inherent in giving away such valuable information freely and without due oversight, and it is this very subject we will discuss in the following chapter.

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