Disrupted Ch1ldhood

The Cost of Persuasive Design

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Executive summary

The Disrupted Childhood Report, published by 5Rights Foundation, explains how persuasive design strategies, deployed to maximise the collection of personal data, impact on children's social, mental and physical development. It questions the legitimacy of commoditising childhood and sets out a series of practical and immediately applicable recommendations for the tech sector, Government, parents and investors.

The battle for children's attention has been characterised by how much time they spend online. As online and offline lives are increasingly blended, it is no longer helpful or feasible to distinguish between the two. **What we must now urgently consider, is what children are doing and why.** If we continue to allow the persuasive design features to dominate the decisions children make online, we are in danger of stunting the creativity and development of a generation. This has far-reaching consequences for individual children, families and society. **We urgently need to consider whether children are autonomous, respected and protected online.**

> **"The system is failing… social networks — they are man-made. If they are not serving humanity, they can and should be changed."**
> — Sir Tim Berners-Lee

The Disrupted Childhood Report explains commonly-used strategies, and highlights how automated technology both leverages and reinforces human instinct, in order to trigger habits and behaviours. Variously called *'reward loops'*, *'captology'*, *'sticky'*, *'dwell features'* and *'extended use strategies'*, persuasive design strategies are deliberately baked into digital services and products in order to capture and hold users' attention and imprint habitual behaviours. **Habits and behaviours formed before 9 years old take significant intervention to change.**[1]

The costs for children, who in the report call for fairer treatment, are palpable. They include **personal anxiety, social aggression, denuded relationships, sleep deprivation and impact on education, health and wellbeing.** At the same time, the current regime of data surveillance, fuelled by persuasive design, raises ethical, moral and legal questions.

Industry insiders, unhappy with compulsive strategies, demand that the technology sector operate within a fully-described set of ethical and social standards. Their powerful words indicate a broader discontent throughout civil society. The seeds of change are seen in the increasing focus of policy makers, the media and concerned adults on the costs for children of persuasive and habit-forming design.

Digital technology promises unlimited potential for children and society. To fulfil its promise it must be deployed in a way that is accountable and proactively meets the needs of its child users. **Services and products should be required to anticipate the vulnerabilities associated with the different ages and developmental stages of childhood in order to fully realise their potential.**

Whilst acknowledging the recent steps taken by some technology companies on behalf of younger users, it remains the case that digital services have consistently failed to prioritise the needs of children over those of shareholders. **The report argues that self-regulation has proven inadequate and that standards delivered universally in the 'best interests of the child',[2] should be set by society, not Silicon Valley.**

The passage of the Data Protection Act 2018 (DPA), with its Age-Appropriate Design Code, offers a unique opportunity to create a children's data protection regime that offers children respect and protection. The question remains whether it will be fully embraced by all stakeholders and robustly enforced.

The report concludes that:

- **As long as the digital environment deploys persuasive strategies for primarily commercial purposes, it will fail to live up to its promise of progress, creativity and knowledge.**

- **It is unreasonable to design services to be compulsive, and then reprimand children for being preoccupied with their devices.**

- **Children are overwhelmed[3] and require more intentional use of digital technologies,[4] and more time out.**

- **Services must be designed to anticipate the rights and needs of children.**

- **The development of a global governance system for the digital technology sector must be a priority for governments and international institutions.**

The Disrupted Childhood Report highlights the urgent need to ensure that the design of digital services and products is appropriate for children. It proposes the following recommendations to make that possible.

Recommendations
We call on industry to

1   **Recognise compulsive use of technology as a public health issue.**

2   **Design all services to make it as frictionless to get offline as it currently is to get online. For example, by designing into services;**

— **Autoplay default off,** and if changed, switch back to 'off' once a child logs out or navigates away.

— **Notifications and summonses default off,** such as buzzes, read receipts, pings and all other non-specific alerts.

— **Default streak holidays** (and temporary absences from streak-type settings).

— **Save buttons** (so children are not forced to stay online to complete a task).

— **Time out and disengagement opportunities;** standardised, easily accessible and frequently offered, even if it is not in services' commercial interests.[5] Including regular reminders of time spent.

— **A barrier to software upgrades that automatically enhance or switch persuasive design features back on.**

— **Alternatives to data collection as a price of entry.**

— **And, stop gathering children's data for the purpose of personalising services to simply extend use.**

3   **Proactively support children who are struggling to manage their use with clearly signposted access to services and technical solutions, for example (but not limited to);**

— Health-based informatics should be used to prompt positive behaviour.[6]

— Embed disengagement strategies in a voice 'tested and desired' by children.[7]

— Children should be encouraged to think about self-care and downtime, i.e. self-soothing, good sustenance, going to bed, sleep.[8]

— IOS and Android Systems must be required to give systems access to services (e.g. Apps) that help tackle compulsive use to enable them to be integrated into a child's user experience.

The above lists are non-exhaustive, there are as many solutions as there are strategies and it requires culture change, technological change and a commitment to change — that puts the 'best interests' of children first.[9] Which is why we also recommend;

(4) **Develop and undertake Childhood Impact Assessments on:**

— Existing services and products.

— Future services and products before roll out — in particular noting the ethical implications of emerging technologies and consider their impact on children.

(5) **Work to an ethical framework built on principles of transparency, accountability, responsibility — in the 'best interests' of children (see Recommendation 20).**

(6) **Clearly and succinctly inform children (and parents of younger children) when persuasive design features are being used, and outline possible impacts, including sleep deprivation, loss of concentration, educational outcomes and impact on emotional state and behaviour.**

(7) **Provide online services and products that prioritise children's 'best interests' over commercial considerations — don't simply lock them out.**

(8) **Listen to the demands of children who are asking for more control, fairer treatment and more peace.**

We call on parents to

(9) **Talk with children about the value of independence and how persuasive design strategies undermine autonomy.**

(10) **Help children disable persuasive design features that can currently be switched off.**

(11) **Agree boundaries based on activity and intentional use, not time limits.**

(12) **Support the introduction of Recommendation 2 by:**

— Using services that proactively design their services with children in mind.

— Not using services that continue to design their services to be compulsive for children.

(13) **Put your own phones down.**

We call on Government to

14 Define compulsive use as an internet harm for children, and to provide advice, information and adjust policy accordingly.

15 Require industry to characterise, name, label and grade the impact of the persuasive design features they are using, in order that children can make effective choices about digital use.

16 Publish a 'fair game' charter that sets out an ethically child-centric set of standards for games and gaming. Setting out ethical rules against behavioural mechanics that try to draw children into addictive behaviours or exhortations.[10]

17 Undertake a public health campaign that explains the dangers of compulsive design strategies and their effects on children, as they move from primary to secondary education. Aimed at Year 6 children and those that care for and teach them, to counteract the 'cliff edge' explosion of usage identified by the Children's Commissioner for England.[11]

18 Support digital literacy as part of the curriculum to equip children to help them navigate the digital world and understand how they are being influenced, and mandate that computer studies and PSHE in schools, and Computer Science Degree courses include modules that explore ethical design, including issues of data harvesting and impact of persuasive design strategies.

19 Ensure frontline professionals (for example, teachers, social workers, health and legal professionals) have appropriate training, and a broad understanding of the full range of opportunities and risks in the digital environment, including compulsive use. Include training as part of degree accreditation and professional standards.

20 Publish an ethical framework to govern all digital interactions with children and young people, based on principles of transparency, accountability and responsibility — in the 'best interests' of children. In doing so, consider the legality, ethics and safety of creating digital habits in childhood.

21 Support the new Age-Appropriate Design Code by providing sufficient resources for the regulator (ICO) to ensure that the Code is fully applied and enforced.

22   **Create an independent, overarching centre of excellence, research and policy for all interventions relating to children in the digital environment. It should have powers and resources to compel attendance and demand accountability, and be a voice for children in all areas of Government including health, justice, education, home affairs and digital.**

23   **Actively work to implement a global framework that sets the ethical, governance and legal boundaries for the technology sector.**

And finally...

24   **We call on institutional and individual shareholders to follow the action of Apple Investors, JANA Partners LLC and the California State Teachers' Retirement System, and demand that companies you invest in design devices, services and products that accommodate the needs and rights of childhood.**[12]

Foreword

The internet is an extraordinary force for good but it was not designed with children in mind. Despite this, it is now part of every aspect of children's lives — used to socialise, play, create and learn.

Given this huge generational social change, it is everyone's responsibility to ensure that this interaction is positive and healthy rather than negative, destructive or dehumanising. This responsibility lies with parents, teachers, Government and importantly, technology companies themselves.

While progress has been made on issues such as parental control features, age verification and promises of improving digital education (although we still await the details including available funding) the fact remains that children are still nowhere near suitably equipped with the skills they need to navigate their way online.

Over the last two years, I have worked with a group of technology, legal and policy experts — including the authors of this report — to tackle these problems. I have called for three interventions from Government: the creation of a digital citizenship programme, to be compulsory in every school; implementation of the intent of the General Data Protection Regulation, by introducing simplified Terms and Conditions for digital services offered to children; and a new Children's Digital Ombudsman to mediate between under 18s and social media companies.

While I am pleased to see that progress has been made around digital education and the implementation of the GDPR, an innovative and bold new approach is needed if we are going to help children develop a healthy relationship with their smartphones, tablets and laptops, and rebalance the playing field between them and the internet giants.

Offline, adults, especially parents, must aim not just to *'educate'* children as they grow up, but to help them develop resilience and the ability to interact critically with the world. Without this, children fail to develop as agents of their own lives. We now have to recognise that for today's children, the online and offline worlds have all but merged, and we must equip them to negotiate both, with equal knowledge, preparation, confidence and skill.

I welcome this new addition to the growing literature about this issue and applaud the great contribution 5Rights makes in articulating the rights and needs of children in the digital environment. In publishing the Disrupted Childhood Report, it continues to lead the way.

Anne Longfield
Children's Commissioner
for England

Introduction

The demand to create a better digital environment for young people is often synonymous with a call to curtail access. 5Rights Foundation does not support this view.

Children and young people consider access to the digital environment as both desirable and essential. The ability for digital technologies to offer prosperity, communality and social benefit must be celebrated. 5Rights believes that the rapid growth of the digital environment must be on terms that meet the needs of children and young people and that every child should be able to access the digital world **creatively, knowledgeably and fearlessly**.

In the UK	
	• 86% of three to four-year-olds have access to a tablet
	• 83% of 12 to 15-year-olds own a smartphone
	• 64% of children aged 12 to 15-years-old own three or more devices[14]

It is hard to overestimate the importance of digital devices in a child's life. Since the introduction of smartphones and tablets in the mid to late 2000s,[13] the speed of adoption has been rapid and personal devices have become ubiquitous.

In 1965, Gordon Moore, co-founder of Intel, predicted that the memory capacity of devices would double every year as the chip size simultaneously shrank (Moore's Law). While processing power has increased, devices have become cheaper and more available. A child with a smartphone now has processing power more than one thousand times greater than that of Apollo 11 in their pocket.[15]

Whilst the pace of technological change has run far ahead of public understanding, for children the digital environment is not an optional extra. Devices are used to study and learn, share opinions and interests, make arrangements and consume entertainment and news.

They are also used as a gateway for creativity and building relationships. **Children are growing up in a rapidly changing society where smart toys, smart cars, smart homes, smart cities (cashless and cordless) are increasingly the norm.**

Concerned debate accompanies each technological invention. Digital technologies, unlike previous inventions, not only enhance real world existence, but offer parallel alternatives. Infinitely portable and powerfully designed alternative and augmented realities are on offer 24/7. The impact of this persistent interactivity, fuelled by a gold-rush for children's attention, has yet to fully penetrate public consciousness: it demands concerned debate and urgent change.

This report seeks to help policy makers, parents and children understand how persuasive design works, its impact on children's health and wellbeing and how it might be addressed.

5Rights exists to ensure that children's rights are upheld in the digital environment. The Fourth Right is **The Right to Informed and Conscious Use**. It is the right for young people to engage with the digital environment intentionally, free from deliberately orchestrated pressure to extend use.

At 5Rights we work closely with children and young people. This report reflects their experiences and captures their voices.

"All I want to do is disconnect from my phone for a long period of time, perhaps weeks, but there are always pressures preventing me. I love the way the internet allows for lots of new opportunities, yet it prevents me from doing a lot of things."[16] *Aged 17*

Chapter ①
Children are struggling
to put down their devices

"The technologies we use have turned into compulsions, if not full-fledged addictions. It's the impulse to check a message notification. It's the pull to visit YouTube, Facebook or Twitter for just a few minutes, only to find yourself still tapping and scrolling an hour later. It's the urge you likely feel throughout your day but hardly notice… The products and services we use habitually alter our everyday behaviour, just as their designers intended. Our actions have been engineered."[17]

Nir Eyal, author, Hooked: How to Build Habit-Forming Products

The preoccupation of young people with their phones is a new norm. It is visible in public spaces, the subject of media headlines and increasingly a cause of familial conflict.[18] In this chapter we look at the attitudes to time spent online.

"Scrolling forever gives me a sick feeling in my stomach. I'm so aware of how little control I have and the feeling of needing to be online and always consuming." — Aged 18

1.1 Children

Children are inherently optimistic about the opportunities that the digital environment offers and believe that it adds significant value to their lives.[19] There are, however, multiple indications that their digital interactions can feel overwhelming or do not offer a meaningful way to connect to others.

"When you're not on your phone or social media you feel as if you don't know what's happening. Also, because of social media, people now struggle to function in a social area when you can't use your phone."
Aged 16

Internet Matters (2015) revealed that 40% of secondary school-aged children and 34% of primary school-aged children *'feel worried that they are addicted to the internet'*.[20]

Often children display absolute devotion to their devices, on the one hand saying they *'could not do without their mobile phone for a day'*,[21] that they are *'best friends'* with their phone[22] or don't feel *'right without it'*.[23] At the same time, they report being *'addicted'*, *'attached'*, *'distracted'*, *'obliged'*, *'always consuming'*, having *'no control'* and feeling *'panicked'*.[24]

A Guardian newspaper study (2016) found that teenagers aged between 13 and 18-years-old experienced anxiety when asked to detox from social media. The participants said they *'hated not knowing what was going on'*, reported *'reaching for their phones in the middle of the night before realising what they were doing'* and said they *'couldn't unwind'* without social media.[25]

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In the same year, Common Sense Media found that one third of American children aged between 12 and 18-years-old struggled to cut down time spent on devices; half said they felt *'addicted to their mobile devices'*.[26]

The tension between being **governed by** and **devoted to** their device is, in part, a result of the persuasive strategies baked into the digital services that children use.

"Tech companies don't seem to think about how hard they are making parents' lives." — A parent[34] of a five and nine-year-old

1.2 Parents and carers

Parents are often told that their children are *'digital natives'*,[27] which implies that children are in control. In reality, research consistently shows young people do not climb far up the digital *'ladder of opportunities'*,[28] but instead spend most of their time on a handful of platforms, predominantly social media-based.[29]

Meanwhile, headlines scream about bullying, sexual content and grooming,[30] to which the policy response is to teach children to be resilient.[31]

This suggests that children are able to make effective decisions regarding their own safety and wellbeing, in an environment over which they have little control and which has not been designed to meet their needs or serve their best interests.

Parents are also told that their child's life prospects are dependent on technology and that only those competent and confident with digital technologies will survive the radical changes in the job market. Last year, professional services firm PwC predicted that around 30% of jobs in the UK are potentially at high risk of automation by the early 2030s.[32] The World Economic Forum advises equipping children and students with skills to harness the power of technology, to ensure that current and future generations are not *'left behind in the global digital skills race'*.[33]

These mixed messages — that children are simultaneously in charge, that they are unsafe and that they must have digital skills — leave many parents confused. Neither separately nor together, do they account for the full range of opportunities on offer, nor the difficulties that the digital environment presents for children, among them the impact of persuasive design.

"We set boundaries and when he is at home we can enforce them — not easily but eventually. When he is out of our sight it is a whole other issue and I resent having to 'police' him all the time. That isn't the sort of trusting parent I want to be."
Parent of a 12-year-old

While trying to manage their children's use, parents struggle with their own digital use. Web-based research platform Dscout found that the average adult smartphone user touched their device 2,617 times each day.[37]

In the UK

- 40% of parents of children aged eight to 15-years-old worry their child spends too much time gaming.[35]

- One third of parents of children aged five to 15-years-old and 40% of parents of children aged between 12 to 15-years-old struggle to control their child's *'screen time'*.[36]

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The Canadian Paediatric Society (2017) concluded that parents found that *'shifting attention between screens and family life [is] stressful, tiring and reduces their ability to interact 'in the moment' with children'*.[38]

"Parents are so hypocritical about young people online — often we are told that we spend too much time on our phones, just to watch them do the same."
Aged 17

"Sometimes [there are arguments] between my husband and me, sometimes between us and the children. It's usually because someone is on a device when someone else wants to talk to them or it's dinner time or some other family situation where the tech is getting in the way."
Parent of an 11 and 16-year-old

1.3 Teachers

Teachers are vocal about their pupils' compulsive use of devices. During a session at education technology show Bett 2018,[40] led by Lord Knight, chief education adviser at TES Global, more than three quarters of the teacher-packed audience voted to ban smartphones in the classroom, reflecting their frustration at trying to teach children who are surreptitiously using their smartphones.

"Digital technology brings benefits, but it's being used in the wrong way."
— Secondary School Teacher[39]

While education policies tend to embrace digital delivery, there is no overarching policy about the use of devices in educational settings. This means that it is up to individual head teachers to determine school rules and to class teachers to police them,[41] setting up a frontline battle of attrition with technology designed to distract.

The Association of Teachers and Lecturers (2016) reported: *"Children are coming to school with poor speech and significantly reduced language skills. They have poor social skills and their motor skills are underdeveloped. Schools are having to address this which seems to be a knock-on effect of too much screen time at home!"*[42]

"I find they [devices] are a huge distraction and students rely on them too much and don't engage with the teacher on the same level."[43]
Post-primary school teacher

A longitudinal study co-led by Harvard Medical School, the University of Alberta and Boston Children's Hospital in 2016 found that students' ability to focus on educational tasks has decreased.[44] In the same study, a teacher observed: *"I see youth who used to go outside at lunch break and engage in physical activity and socialisation. Today, many of our students sit all lunch hour and play on their personal devices."*[45]

What children, parents and teachers are experiencing is not the result of intentional use, but the consequence of deliberate design strategies that train device users to remain engaged and interactive, at any cost.

Deployed singly and in consort these aspects of design are collectively known as persuasive design strategies.

Chapter 2
The commercial imperative

Digital technologies can be put to an infinite number of tasks and uses, but the last decade has seen the digital environment become increasingly commercialised.

Many aspects of the digital environment that were conceived as free and open are increasingly privately-owned and tightly controlled. Services that look free, especially to children, are predicated on a service contract paid for with the currency of personal data.

The value of this data and the lengths to which the digital environment is designed to gather it are opaque to most users, and nearly all children.

2.1 The 'attention economy'

The Washington Post (2016) revealed the 98 data points that Facebook used to profile its users that it offered to advertisers. The data points included information on whether a user was expecting a baby, the type of car they drove, their political affiliations, religious beliefs, net worth and the number of credit lines they had.[47]

> **"The thought process that went into building these applications, Facebook being the first of them… was all about: 'How do we consume as much of your time and conscious attention as possible?' God only knows what it's doing to our children's brains."**[46]
> — Sean Parker, co-founder, Facebook

Research by Cambridge University's Psychometrics Centre in collaboration with Microsoft Research Centre (2013), found that with nothing more than the Like button, a user's sexuality (88% and 75% accuracy for men and women respectively), drug use (65% accuracy), parental relationship status (60% accuracy), ethnicity (95% accuracy) and political views (85% accuracy) were revealed.[48] Many users, particularly children, have limited understanding of how much information they are revealing.

Data gathered from multiple digital activities provides a profile of the user that can be used to ascertain or predict social and market trends. It may be used as part of a big data set that helps data analysts and computer scientists (including medical) to understand patterns of behaviours and outcomes or to gauge whether an individual has the appropriate attributes and skills for a job vacancy or a place in an educational establishment. Such data may be used for direct marketing purposes or to calculate an individual's social status or financial assets.

In recent months, concerns have also been raised about the extent to which personal data has been used for profiling purposes during political campaigns and how surveillance data gathered by government agencies may have been sold or shared with artificial intelligence developers,[49] whose purposes and impacts are not yet known.

The current generation of children are the first to have data collected about them at every stage of their life. Professor Deborah Lupton and Dr. Ben Williamson in The Datafied Child (2017) point out that many parents start constructing a digital profile before their child is even born.[50] 81% of children have a digital footprint before they are two years old.[51]
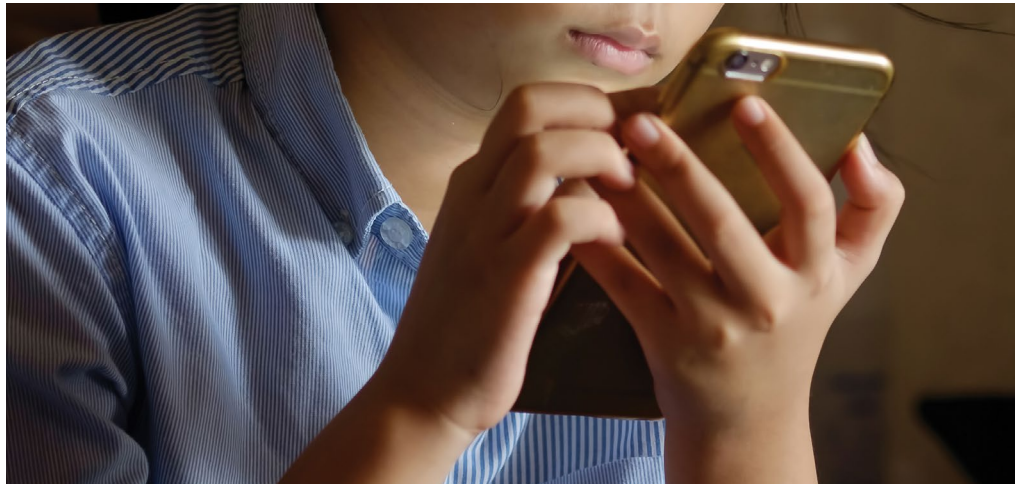
This runs counter to social norms offline where it is understood that children have a right to privacy, and that the vulnerabilities associated with childhood make it inappropriate to profile children.

> **"It makes me angry that businesses use specific designs to keep young people on their app/website. They are exploiting unknowing, young people so that they are able to build up ad revenue."**— Aged 17

Data is cheap to collect and can be easily shared. Those who control data repeatedly extract value at minimal cost, resulting in high-value companies with lower costs than traditional industries. The Big Five — Apple, Amazon, Alphabet, Facebook and Microsoft — or Seven, if you include Chinese giants Alibaba and Tencent, control the bulk of devices and services in the data collection value chain; they are also among the most valuable companies in the world.[52]

Central to this value chain are persuasive design strategies that entice and keep the user online in order to create more data.

2.2 Persuasive design

"Never before in history have such a small number of designers… had such a large influence on two billion [now three billion] people's thoughts and choices."[53]
Tristan Harris, ex-Google Ethicist, founder of the Centre for Humane Technology

Persuasive design, a term coined by psychologist BJ Fogg, combines the theory of behavioural design with computer technology. Behavioural design uses a system of rewards and punishments to determine human behaviour patterns. Both persuasive and behavioural designs can be used to increase wellbeing for personal and social good. However, it is arguably more often used to manipulate human behaviour so that users subconsciously act in the commercial interests of others.

What is characterised as a struggle for attention is, in fact, deliberately orchestrated, engineered and designed. Persuasive design strategies are deployed for commercial purposes to keep users online.

"You lose precious time with your friends and family that you cannot get back."
Aged 13

It is not reasonable to design services to be compulsive and then reprimand children for being preoccupied with their phones.

A brief history of behavioural design

At the beginning of the 20th Century, Russian physiologist Professor Ivan Pavlov discovered how to get dogs to produce an instinctive salivating response to a stimulus that bore no relationship to food. Having observed that dogs naturally salivate in anticipation of food, Pavlov experimented by ringing a bell whenever he fed the dogs. He then stopped bringing food and only rang the bell. The dogs, *'conditioned'* to associate the ringing with food, continued to salivate at the sound of the bell. This is known as classical conditioning.

In the 1940s, psychologists BF Skinner and Charles Ferster built on Pavlov's work introducing *'schedules of reinforcement'* whilst experimenting with pigeons. They found they could teach the pigeons that their behaviour had consequences. This form of reinforcement, *'operant conditioning'*, requires the deployment of both reward and punishments to be effective.

Classical and operant conditioning are acknowledged as having strengths and weaknesses, but others have gone on to build on the key insight that human and animal behaviour can be conditioned (trained) to change.

In the 1990s, neuroscientist Wolfram Schultz demonstrated that once the brain receives a cue or trigger to behave in a way that is rewarded, it will automatically seek out further rewards. His findings implied that the human brain could be trained to repeat *'reward seeking'* actions. Schultz concluded that the use of reward signals was so powerful that they constrained *'free will'* to act.

In the late 1990s, Professor BJ Fogg set up the Persuasive Design Lab and soon after published Persuasive Technology: Using Computers to Change What We Think and Do.[54] By 2009, he had developed The Fogg Behavior Model, combining advances in technology with behavioural science. The Behavior Model enabled computer scientists to build software that reward or punish certain behaviours in order to elicit desired changes in behaviour.[55]

Whilst Fogg's Persuasive Design Lab was set up with the intention of combining technology and behavioural science for social good (for example by developing programmes that use persuasive design to help people stop smoking or resolve conflict), the Lab became a *'hothouse'* for Silicon Valley. Alumni include Mike Krieger, co-founder of Instagram; Tristan Harris, ex-design ethicist at Google; and Ed Baker, head of growth at both Facebook and Uber, among others.[56]

Fogg's is not the only theory of behavioural design; another notable example is Professors Richard H Thaler and Cass R Sunstein's Nudge Theory. Their model uses *'choice architecture'* to ask questions in a way that nudges individuals' behaviour *'in beneficial directions without restricting freedom of choice'*.[57] The Nudge Theory found favour with Britain's former Prime Minister David Cameron who set up The Behavioural Insights Team within the Cabinet Office in July 2010 to *'enable people to make better choices for themselves'*.[58]

Separately and together these theories build on the proven concept that human behaviour can be manipulated by priming and conditioning, i.e. by manipulating human instincts using rewards and punishments.

If it's free, how do they make money?

By collecting and selling your data.
The US Federal Trade Commission lists
the following data as routinely gathered.

Name Previously used names **Address** Address history **Longitude**
and latitude **Phone numbers** Age **Height** Weight **Gender** Race & ethnicity **Country of origin** Religion (by surname
at the household level) **Languages** Family ties **Demographic characteristics of family members** Surnames in household
Single parent with children Ethnic and religious affiliations **Friend connections** Level of usage **Heavy Facebook user** Heavy
Twitter user **Twitter user with 250+ friends** Is a member of over 5 social networks **Online influence** Type of media posted
Uploaded pictures Use of long distance calling services **Presence of computer owner** Use of mobile devices **Social media and
internet accounts** Demographic and business data **Number of baths** Number of rooms **Number of units** Presence of fireplace
Presence of garage Presence of home pool **Apparel preferences** Attendance at sporting events **Charitable giving**
Participation in sweepstakes or contests **Pets** Dog owner **Political leanings** Reading and listening preferences **Santa fe/
native american lifestyle** New age/organic lifestyle **Is a member of over 5 shopping sites** Media channel usage — daytime tv
Bible lifestyle Leans left **Ability to afford** Credit card user **Read books or magazines about travel** Amount spent on
goods **Buying activity** Method of payment **Military memorabilia/weaponry** Retail purchases — most frequent category
Mail order responder — insurance Dollars — apparel — women's plus sizes **Dollars — apparel — men's big & tall** Books —
mind & body/self-help **Propensity to order prescriptions by mail** Smoker in household **Use of corrective lenses or contacts**
Allergy sufferer **Magazines — health** Weight loss & supplements **Purchase history or reported interest in health topics
including:** allergies, **arthritis,** medicine preferences, **cholesterol,** diabetes, **dieting,** body shaping, **alternative medicine,** beauty/
physical enhancement, **disabilities,** homeopathic remedies, **organic focus,** orthopaedics **and senior needs** Social security
number **Driver's license number** Birth date **Birth dates of each child in household** Birth date of family members in household
Education level Grandparent in house **Spanish speaker** Foreign language household (e.g. Russian, Hindi, Tagalog, Cantonese)
Internet connection type Internet provider **Dwelling type** Home size **Listing price** Media channels used **Political conservative**
Political liberal **Activism & social issues** Cruises booked **Preferred vacation destination** Preferred airline **Marital status**
Presence of elderly parent **Presence of children in household** Occupation **Veteran in household** Households with a
householder who is hispanic origin or latino **Employed — white collar occupation** Employed — blue collar occupation **Work
at home** Flag **Length of residence** Household size **Congressional district** Bankruptcies **Criminal offenses and convictions**
Judgments **Liens** Marriage licenses **State licenses and registrations** Voting registration and party identification **Electronics
purchases** Operating system **Software purchases** Census tract data **Address coded as public/government housing** Heating
and cooling **Home equity** Home loan amount and interest rate **Lender type** Length of residence **Market value** Move date
Rent price Type of owner **Type of roof** Year built **Gambling — casinos** Gambling — state lotteries **Thrifty elders** Life events (e.g.
retirement, newlywed, expectant parent) **Magazine and catalogue subscriptions** Participation in outdoor activities (e.g. golf,
motorcycling, skiing, camping) **Assimilation code** Preferred celebrities **Preferred movie genres** Preferred music genres **Donor
(e.g. religious, political, health causes)** Financial newsletter subscriber **Upscale retail card holder** Affluent baby boomer **Working-
class moms** Working woman **African american professional** Membership clubs — self-help **Membership clubs — wines**
Exercise — sporty living **Winter activity enthusiast** Participant — motorcycling **Outdoor/hunting & shooting** Biker/hell's
angels **Presence of gold or platinum card** Credit worthiness **Recent mortgage borrower** Credit worthiness **Recent mortgage
borrower** Pennywise mortgagee **Financially challenged** Owns stocks or bonds **Investment interests** Discretionary income
level **Credit active** Credit relationship with financial or loan company **Credit relationship with low-end standalone department
store** Number of investment **Properties owned** Estimated income **Life insurance** Loans **Net worth indicator** Underbanked indicator
Tax return transcripts Type of credit cards **Brand preferences** Insurance renewal **Make & model** Vehicles owned **Vehicle
identification numbers** Vehicle value index **Propensity to purchase a new or used vehicle** Propensity to purchase a particular
vehicle type (e.g. SUV, Coupe, Sedan) **Motor cycle owner (e.g. Harley, off-road trail bike)** Motor cycle purchased 0-6 months ago
Boat owner Purchase date **Purchase information** Intend to purchase — vehicle **Travel purchase — highest price paid** Base of
last purchase **Air services — frequent flyer** Vacation type (e.g. casino, time share, cruises, RV)

2.3 The zero-sum game for our attention

"The power to design user behavior ought to come with a standard of ethical limitations."[59]
Nir Eyal

This year, former Google design ethicist Tristan Harris launched the Center for Humane Technology, which describes the challenge of persuasive design in the following terms:

There's an invisible problem that's affecting all of society…

Facebook, Twitter, Instagram, Google have produced amazing products that have benefited the world enormously. But these companies are also caught in a zero-sum race for our finite attention, which they need to make money. Constantly forced to outperform their competitors, they must use increasingly persuasive techniques to keep us glued.

They point AI-driven news feeds, content and notifications at our minds, continually learning how to hook us more deeply — from our own behaviour.

Unfortunately, what's best for capturing our attention isn't best for our wellbeing:

- Snapchat turns conversations into streaks, redefining how our children measure friendship.

- Instagram glorifies the picture-perfect life, eroding our self-worth.

- Facebook segregates us into echo chambers, fragmenting our communities.

- YouTube autoplays the next perfect video, even if it eats into our sleep.

These are not neutral products. They are part of a system designed to addict us.[60]

The commercial imperative of Big Tech to design compulsive use into digital products and services conflicts with the needs and rights of children.[61]

In considering how to fulfil those needs and rights, we must first understand persuasive design strategies.

"I worry… that he seems to be overwhelmed with so many messages and constant communication from his friends. The alerts go off constantly. I couldn't cope as an adult, it is overwhelming for children."
Parent of a 12-year-old

"Even though social media can be great, it can be like a contagious disease where people can't stop looking at their phones and spreads the word of 'oh you need to look at this'." *Aged 12*

"Our ability to live the lives we want to live… through technology is a design problem, not just a personal responsibility problem"[62]
— Tristan Harris

Chapter **3**
Strategies that keep users online

Persuasive design strategies and techniques may be used singly or in concert but they all follow Professor Fogg's understanding that human instincts can be accelerated, nudged and determined by technology that, in turn, changes or trains human behaviour.

In this chapter we explain the power of some of the most commonly used persuasive design strategies.

"The short-term, dopamine-driven feedback loops that we have created are destroying how society works… No civil discourse, no cooperation, misinformation, mistruth."[63]
— Chamath Palihapitiya, former vice-president of User Growth, Facebook

3.1 The rush (dopamine)

Human beings respond to the promise of a reward by releasing a chemical in the brain known as dopamine.[64] In some settings the reward is obvious; for example, an affirmation, such as a Like, from another user. Others are less understood; for example, typing bubbles or a read receipt. The anticipation triggers a small release of dopamine, which technology theorist Dr. Michael Chorust has described as the brain's *"reward-seeking drug"*.[65] Once the reward has been absorbed, the dopamine fades leaving the desire for more.

Children's predilection to seek immediate gratification makes them particularly susceptible to habit-forming rewards.[66]

This makes it difficult for them to ignore the prospect of a dopamine reward, even when this conflicts with other essential daily activities, such as sleeping or eating.[67]

Variable rewards hold a special thrill, as the user anticipates a reward that they know could come but is tantalisingly just out of reach. A gambler waiting to see where the roulette wheel will stop or a viewer watching a presenter's dramatic pause before they announce a winner. In both cases, the individuals experience a dopamine rush as they anticipate the unknown outcome.

Professor Adam Alter explains: *"…it's not guaranteed that you're going to get Likes on your posts. And it's the unpredictability of that process that makes it so addictive. If you knew that every time you posted something you'd get 100 Likes, it would become boring really fast."*[68]

Online services are littered with these apparently benign reward features.

Case study

Angry Birds

Dr. Chorust describes the game Angry Birds as *"a terrific manipulator of the brain's dopamine system"*.[69] The game involves firing cartoon birds from a slingshot to knock down precariously built towers. Launched in 2009, it has since been downloaded more than 3.7 billion times.[70]

*"The dopamine action in your brain makes you want to know, urgently, what will happen when you fire the bird. And it's extremely easy to get yourself in a position of wanting, because the game is so simple. It gives you intermittent but extremely satisfying rewards. So you pull the slingshot again and again and again. And again and again and again and **AGAIN**."*[71]

Angry Birds is just one example of thousands of games that use reward loops to make playing compulsive. What is less apparent is that the same persuasive strategies are woven into most other digital services, such as social media, shopping, news, education or even entertainment.

They prime users to repeat behaviours; as the loop becomes ingrained so the action becomes a habit. Neuroscientist Norman Doidge explains that the brain is not static but that conditioning (repeated activities) alters it.

> **"You feel the need to use social media all the time in order to be social or popular."** — Aged 14

The ability for the brain to change is called *'neuroplasticity'*;[72] this makes it more capable of adapting to a changing environment, but also more vulnerable to outside influencers.[73]

A user's device is the means to access rewards; an equally integral part of the loop. Users habitually touch their pocket, bag or phone to check for their smartphone and then reactivate it in order to generate new rewards.

3.2 Popularity contest

Human beings are social beings. Our identity is defined by and measured against other group members. Persuasive design strategies exploit the natural human desire to be social and popular, by taking advantage of an individual's fear of not being social and popular in order to extend their online use. For young people, identity requires constant attention, curation and renewal. At key development stages it can be overwhelmingly important to be accepted by your peer group.[74]

Quantifying friends, Likes, retweets or followers creates a public metric of personal value. At a glance, one user can see how many connections or responses another is getting and measure themselves against that. Posts ranked by popularity in a newsfeed are given pride of place on the screen, algorithms designed to promote the already popular, help them travel further, while constantly building the statistics. Quantity not quality of interaction is the metric that is measured.

> **"Sometimes using Snapchat can feel like you have achieved something when all you receive is a number."**
> *Aged 14*

Fear of missing out, which even has its own widely used acronym *'FoMO'*, is the inverse of the popularity contest. Professor Andrew Przybylski *et al* describes FoMO as *"a pervasive apprehension that others might be having rewarding experiences from which one is absent"*.[75]

Those who regularly experience FoMO display a slavish need to stay online just in case they miss an opportunity for personal validation, or to confirm their own low status by passively watching others more popular than they are, exacerbating their experience of missing out. Such *'pervasive apprehension'* is fuelled by automated and targeted messages pointing to the activity of other users in an individual's network (and the network of their network) revealing a vast swathe of activity from which they, the non-active user, is excluded.

> **"Companies target your paranoia to make you feel you're missing out and that if you're not online something drastic concerning you may happen."**
> — Aged 16

Those with FoMO use social media much more compulsively, including checking social media accounts as soon as they wake up, during meal times and last thing at night.[76]

The need to quantify relationships, and the associated pressure to not miss something, compels a child to enter a cycle in which they act and share continuously, thereby extending their time online.

3.3 Summonses: buzzes, pings, vibrations and the colour red

"When I walk around and see people staring at their phones often it's because they've taken out their phones to look at Facebook notifications, that's something I feel is not going in the right direction for society."[77]
Justin Rosenstein, co-designer of the Like button

Human beings respond to noises, movements and light. It is a necessity borne from our hunter-gatherer forebears who needed to be alert to the presence of predators or other dangers.[78] Summonsing is one of the most powerful strategies of persuasive design.

Summons come in many forms. It might be a pop up or a locked screen message; short, long or insistent vibrations; surges of light or sharp sounds or a personalised call. All are designed to create a sense of urgency, which acts as a powerful summons. Often the only way to stop the influx of notifications is to comply with the call for attention.

"You can feel weak emotionally and vulnerable after spending too much use."
Aged 16

"You can't leave it because you'd be up all night answering the old messages and the new ones asking why you didn't answer the first message — sometimes when I get back to my phone then I get LITERALLY hundreds."
Aged 14

Children are less able to make a hierarchy of demands so tend to answer the newest first instilling a habit of responding to *'the new'*.[79] This has profound implications since routines and habits formed before the age of nine are unlikely to change.[80]

In 2017, Ofcom reported that 53% of three to four-year-olds were online, a statistic that rose to 79% of five to seven year-olds and 94% of eight to 11- year-olds.[81]

Habit-forming summons are further enhanced by machine learning and artificial intelligence systems[82] which are able to learn when a user is most likely to respond, so send notifications at an *'optimal time'*.[83] Leanplum, a mobile marketing platform, recommends services push messages between 8pm and 10pm to get the most impact.[84] Re-engagement with gaming apps following push notifications peaks between 11am and 1pm, while social media peaks at 10am and then again at 11pm.[85]

Whilst some settings can be switched off, this action almost always triggers warnings to users that they risk missing out on new content.[86] Users are then forced to weigh up the intrusiveness of the notifications against their personal FoMO. For many children, this represents an impossible choice.

Tristan Harris highlights the power of the small red circle. "**Red** *is a trigger colour,"* he explains. *"That's why it is used as an alarm signal."*[87] The small red circle that appears on apps, messages and updates, implies urgency and encourages the user to respond by checking, thereby re-engaging with the service.

The persuasive strategy of constant summons creates an exhausting level of demand that exploits a child's human instinct to respond.

3.4 Losing time

"I have two kids now and I regret every minute that I'm not paying attention to them because my smartphone has sucked me in."[88]
Loren Brichter, designer of the pull-to-refresh mechanism

Routinely, the amount of time required or spent doing online tasks is concealed. The decision to continue watching, playing or scrolling is designed into the service.

Examples of this are ubiquitous in the digital environment, but among them are:

1 Auto play, auto suggestion and infinite feeds
Each one automatically replaces the next piece of content or action before the previous one has finished, thereby minimising or eliminating breaks during which a user might decide to disengage.

2 Creating a bubble
Music or sounds are introduced to desensitise the user to their immediate real-life surroundings. These are combined with sharp intrusive sounds that make the player hyper-aware of the screen. Such techniques are particularly used in gaming.

3 Small demands
These are invitations, such as *'click here'*, *'watch video'*, *'accept invitation'*, *'Like'*, *'agree'*, *'post'* or *'read message'*. Each demand seems small but will frictionlessly lead to further demands for action.

"Using technology often makes me feel like I could be missing out on time actually with my friends." — Aged 15

4 Slowing progress
These barriers force a user to do or consume *'something'* before they can access the information they are seeking. They might take the form of sponsored ads above searches, videos that break up news articles or shopping sites that prevent precision searches. Each barrier is small, but as the user swipes, removes and negotiates the barriers, their time online is extended before getting to what they initially sought. Anthony Wagner, associate Professor of Psychology at Stanford University, explained: *"Where there are multiple sources of information… [users] are not able to filter out what's not relevant to their current goal. That failure to filter means they're slowed down by irrelevant information."*[89]

5 Pace of play
Users are more likely to stop if the pace becomes predictable. Games partition progress into levels and change the pace and intensity of play, to offer the prospect of resolution while obscuring the fact that the game is designed to be played indefinitely, or at least as long as possible. Varying pace of play is not restricted to games. On social media, users can be *'swiftly dragged into a high speed retrospective of the last 24 hours in the life of someone they may or may not know'*[90] before introducing a slower pace as they scroll through endless feeds whilst notifications offer pacy interjections.
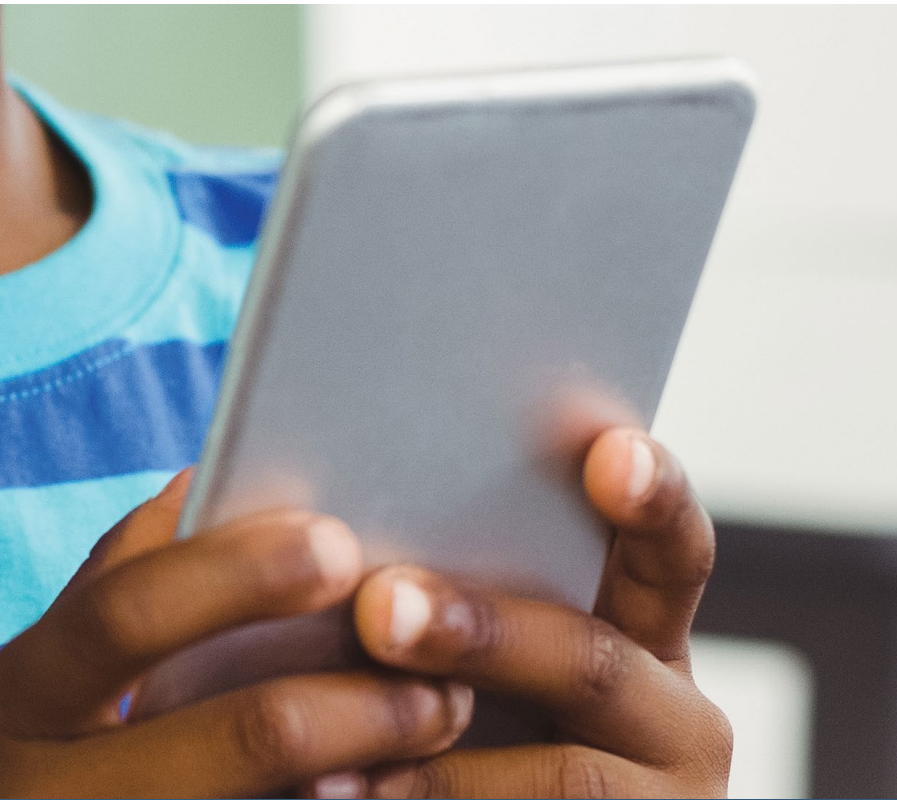
6 No save
Some games prevent users from saving progress until they reach a predetermined point. If they break away before this point, all previous progress is lost. So, players play on.

Each of these design features creates a pull towards extended use.

The ubiquity of these strategies results in a very real sense of having 'lost time' doing you are not quite sure what.

No save button

In a recent 5Rights workshop, we met a nine-year-old boy who spoke about his arguments with his mum and dad when they asked him to stop playing a particular game. He described screaming matches, missed dinners, exasperated parents and his own personal regret.

This child was using a game that took three hours to complete, designed with no save function so that there was no alternative to the deliberately orchestrated desire to complete. As a result, he neglected *'offline'* aspects of his life including sleep, meals and friends, and was at loggerheads with his parents. He was visibly upset. All he wanted was a pause or save button, but it was not designed into the game, in order to make the pull to play greater than the opportunity to stop.

3.5 Social obligation

"A social validation feedback loop… exactly the kind of thing that a hacker like myself would come up with, because you're exploiting a vulnerability in human psychology."[91]
Sean Parker, co-founder, Facebook

Part of being a social animal is a sense of obligation weighted against the nature and depth of the social bond. Most people feel a greater obligation to their trusted circle of family and friends than to the broad network of people they know less well, and significantly more than their obligations to those at the furthest fringes of their community.

By contrast, online reciprocity frequently extends indiscriminately to as many people as possible in the user's network so that, in addition to intentional acts of social validation or communication, it can require large numbers of responses that do not acknowledge the complexity or limits of the relationships. Young people engaged in swiftly changing friendship patterns are held to old obligations, or made to feel guilty about moving on. This presents a perfect scenario for social anxiety.

The obligations baked into services are presented in a manner that deliberately punish inaction, for example, by letting the sender know when the recipient has received or read a message or text. Knowing someone knows that you are online creates a heightened obligation to respond. Creating large quantities of social obligations within online relationships offers not only the exhausting prospect of constant social management, but can prevent the development of more nuanced and satisfying relationships driven by personal choice not numerical highs.

For children at different development stages, their peers represent a powerful mirror of status and identity. Persuasive design strategies that emphasise quantity over quality create the backdrop for social anxiety and issues of self-esteem.

Case study

Snapchat streaks

When two users each send the other a snap a day for three days in a row, they start a streak. The *'goal'* is to keep the streak going for as long as possible. As the unbroken streak rises, it becomes a way of quantifying a friendship. It is common for children to maintain multiple streaks with competing friendships or to build streaks with children they don't know well to appear popular.

'Streak management' can be time-consuming and distracting. The user is notified each time they receive a snap, which acts as a prompt to reciprocate. The compulsion to maintain the streaks, coupled with the need to not let others down, means that it is not unusual for children to get friends or siblings to *'babysit'* their streaks at times they are unable to access their phones.

Breaking a streak is viewed as an indictment of a friendship. To avoid these socially awkward events, users are obliged to send multiple snaps a day irrespective of the quality of the relationship or the content of the communication. This cycle of obligation is deliberately designed to encourage repeat visits to Snapchat.

The maintenance of children's streaks can run into many hours a week. In a recent 5Rights workshop, children were astonished by their weekly total time spent on Snapchat. One boy discovered that he had spent 32 hours on the app — effectively four working days — during each of the previous three weeks.

"(There is a) pressure of losing your friends and ending lifelong friendships if you forget to send a streak one day."
— Aged 13

3.6 Emotional highs

Highly emotive content attracts and holds attention and increases engagement. As Jaron Lanier, the inventor of virtual reality, explains, companies hold our attention best by making us angry, insecure or scared:

"The most effective situation is when users get into weird spirals of mob-like agreement or disagreement with other users."[92]

Polarised and/or extreme content keeps users online as they click through to the next equally emotive and extreme story, creating a cycle of activity. *'Clickbait'* is a term used for a title or heading that is deliberately written in a manner that entices a user to click on a link. Journalist Arwa Mahdawi describes YouTube as a *"terrifying cesspit of clickbait content"*, with one YouTuber feeding a homeless man biscuits filled with toothpaste and another killing her boyfriend in a prank gone wrong.[93]

Clickbait articles tend to disappoint, but by using *'punchy'* emotions such as anger, humour or inspiration and by promising to satisfy users' curiosity, they offer the promise of something rewarding. Bryan Gardiner, a lecturer in computer science at Ulster University, writes: *"How many cheap emotional ploys, false promises and empty listicles and quizzes can a person endure?... research has shown that humans are quite willing to put up with massive amounts of disappointment and frustration, so long as there is an occasional pay-out."*[94] A variable reward.

Whilst clickbait offers a clear example of extreme content it comes in many forms. Newspapers have followed the success of clickbait by introducing their own screaming headlines online.

True stories take six times as long to reach people than fake ones filled with outrageous claims,[95] and comment boxes are filled with aggressive and counter aggressive opinion.

Professor John Suler discusses the *'toxic'* online disinhibition effect, where people are more likely to share personal information or display more intense behaviour than they would offline, including rude language and harsh criticisms.[96]

Young people, particularly early teens (aged between 13 and 15) are characterised by idealism and tend towards polarised thinking making it more likely that they will respond to emotionally charged content.[97]

Professor Harry Dyer from the University of East Anglia explains that *"the mounting pressure to outdo oneself and others demands more extreme content, until eventually — inevitably — a line is crossed. Whether by embodying beauty ideals or eliciting laughs, everyone in the 'omniopticon' [an 'increasingly powerful form' of 'social surveillance' where the many are watched by the many][98] is scrambling to be at the centre of attention… people are pushing the limits in order to get noticed and this includes doing bizarre and even deadly things — like eating laundry detergents."[99]*

Not all extremity is hateful, bullying or violent. Emotional reactions also come from the cute and the fuzzy.

Parents, keen to occupy their children, put on *'nice'* content to keep them entertained, priming children to expect a cycle of emotional reward and the desire for more.

"I'm happy as long as she is occupied… [but] every day [there are arguments]! Usually when I'm trying to get her to do something else like go to bed or do her homework." — Parent of a 10-year-old

Case study

Sneezing pandas and dancing kittens

Among the most watched and shared videos on YouTube are those that feature cute animals. In 2014, internet data from video marketer ReelSEO showed that two million cat videos were posted on YouTube, collectively getting more than 24.6 billion views.[100]

Humans are instinctively drawn to people, animals and even cartoon characters with infantile features (such as disproportionately big eyes, chubby cheeks and large foreheads) as they trigger the user's *'baby schema'* or *'cute'* response. That is our evolutionary instinct to nurture and care.[101]

The baby schema response emerges early during development. Children as young as three to six-years-old are drawn to, and will spend longer staring at, images of animals that have high levels of childlike features.[102] Triggering a child's *'cute'* response keeps children, especially very young children, engaged for longer.

Cute images release dopamine, encouraging users to seek out further images. Yale psychologist Oriana Aragon says: *"We want our cute fix."[103]*

The use of cute as a reward appears as one of the least problematic persuasive strategies. But as we outline in Chapter Four, a key issue for children, even very young children, is the opportunity cost — what they are not doing while watching cat videos.

Chapter **4**

Impact of persuasive technologies on childhood

Access to digital technologies for life, learning, social and entertainment is crucially important to children and young people, for the development of communities and for the future of society as a whole.

The digital environment is entirely man and woman made. Any, or all, of the persuasive design strategies described in Chapter Three could be abandoned, recalibrated or redesigned to meet the needs of children and young people.

4.1 Anxiety and aggression

Encouraged by persuasive loops of reward, reciprocity, obligation, heightened emotion and automated spread of content (particularly highly-charged content), children and young people are sharing their photographs, opinions, personal information and vulnerabilities on an unprecedented scale.[104] We have explained how the need for validation creates a habit of needing more. Managing such public and frequent interactions creates enormous pressures for young people, and with it comes anxiety, low self-esteem and mental health issues[105] at ever-increasing levels.[106]

> **"The more time you use social media the more addicted you are and there is no control over it."** — Aged 15

Professor Jon Elhai *et al* in the Journal of Affective Disorders (2017), is one in a long line of academics who link elevated levels of depression to excessive social media use.[107]

Stanford University's Professor Clifford Nass agrees. He warns that children have an unrealistic world view provided by the overwhelmingly happy curated postings they see online. He argues that this leads to the erroneous conclusion that *'everyone is happy, except me'*.[108]

An excessive amount of sharing also translates into exaggerating, polarising and aggressive behaviour, fuelled by the need to get noticed. Ditch the Label's Annual Bullying Survey last year found that 69% of respondents admitted to having done something abusive towards another person online,[109] while 35% of respondents had sent a screenshot of someone's status or photo to laugh at them in a group chat.[110] Girls are disproportionately affected. In 2017 Plan International UK found that almost half of girls aged between 11 and 18-years-old had experienced online abuse.[111]

The young contributors to The Internet on Our Own Terms focused on the personally damaging digital content which left them feeling *'highly vulnerable online'*.[112] The participants recounted that other children had been bullied, forced to move schools, and that police had even become involved when a child's private content had been shared more widely.[113]

The culture of excessive sharing, fuelled by persuasive technologies, has resulted in an epidemic of self-doubt, anxiety, low self-esteem and correspondingly aggressive behaviour among the young.[114]

Social media addiction and personality augmentation online
Dr. Liam Hackett,
Chief Executive,
Ditch the Label

A recent Ditch the Label survey of more than 10,000 young people aged between 12 and 20-years-old found that 61% of respondents would struggle to last longer than 24 hours without access to their social media, with many suggesting that it would make them anxious, lonely or distressed.[115] We are increasingly a society of social media addicts, with young people being some of its biggest consumers.

Against a backdrop of media rhetoric that tells us, often in the most nuanced of ways, that we aren't quite good enough, many young people are seeking external validation online through the use of social media. Part of the appeal of social media is the ability to publish an augmented version of one's reality in an attempt to be the person with the most Likes or the most followers.

Increasing amounts of young people are using social media versions of reality as benchmarks against their own lives; inevitably leading to significant rises in the rates of depression, anxiety and body dysmorphia, amongst many other health and behavioural issues.

The pressure to be popular online is reinforced by the social networks with their invasive and frequent notifications, guilt-trip emails and emotional account deactivation processes. Social media outlets are quick to glamorise their most popular users and showcase them to global audiences as a tool to encourage deeper content consumption and creation.

In order to counteract the damage that social media is having on the lives of young people, social networks must be transparent about their models of revenue generation and algorithm changes. The dangerous trend of seeking external validation online must be counteracted with self-esteem training for children.

Furthermore, young people must be empowered to make educated decisions about the ways in which technology weaves into their lives. They should not be guilt-tripped into creating content or keeping their social media accounts active with automated emails and emotional processes.

4.2 Quality of relationships

The quality of social interactions diminishes the more devices are used.[116] Brown, Manago and Trimble (2016) found that the sheer volume of people and events, and the emphasis on popularity numerically quantified, lowered the quality of communication.[117]

Dr. Caroline Fisher similarly argues that pathological internet use affects an individual's sense of wellbeing and can lead to social withdrawal, self-neglect, poor diet and family conflict.[118]

> **"Often, we can be right next to each other and they will still be 'Snapchatting' each other."** — Aged 15

The PISA Wellbeing report found that children who are *'extreme internet users'* (defined as more than six hours) were 15.1% less likely than moderate users (1–2 hours) to report a sense of belonging, and more likely to report feeling lonely, at school.[119] Meanwhile a Common Sense Media report found that 70% of American teenagers, aged between 12 and 18 years, fight with their parents about their devices; 32% on a daily basis.[120] The Education Policy Institute evidence review found that excessive internet use is preventing young people from developing strong relationships offline.[121]

Online relationships can enrich a child's social and emotional life, especially those who may be isolated in other settings. However, the persistent demands to interact often diminish the quality of relationships, levels of emotional understanding and create conflict.

4.3 Opportunity cost

There is an undeniable truth that if you spend (or lose) a great deal of time doing one thing, something else must *'give'*. This is the opportunity cost.

Creativity, autonomy, memory
The potential to access information, creative activities, undertake research or build and maintain important relationships online must not be ignored. But creative activities of UK children only occupy around 3% of their total time online,[122] meanwhile UK teenagers[123] are spending less time on informational, civic and creative activities now, compared with a few years ago.[124]

> "I love reading, but by the time I've spent an hour too long on my phone, I can no longer read my book."
> *Aged 17*

MIT Professor Sherry Turkle notes:

> "The capacity for boredom is the single most important development of childhood. The capacity to self-soothe, go into your mind, go into your imagination. Children who are constantly being stimulated by a phone don't learn how to be alone, and if you don't teach a child how to be alone, they will always be lonely."[125]

Development of memory is another opportunity cost. Dr. Benjamin Storm's (2016) research on internet use and memory found that when participants were allowed to use Google to answer questions, they used it even when they already knew the answer.[126] He commented: "Memory is changing. Our research shows that as we use the internet to support and extend our memory we become more reliant on it. Whereas before we might have tried to recall something on our own, now we don't bother."[127]

Memory and imagination share the same set of development and cognitive needs as *'agency'* — that is, children making choices based on information that they can understand in conditions that allow for those choices to be meaningful.[128]

The development of memory is a key component of creating an individual's identity, holding shared experiences and therefore forming a group identity — a necessity for building and maintaining communities and society.

Sleep and sleep deprivation
Perhaps one of the most publicised opportunity costs of compulsive device use is sleep deprivation. In a large-scale 2016 survey for JAMA Paediatrics, academics from King's College London found:

"Bedtime use of media devices doubles risk of poor sleep in children."[129]

Specifically, it leads to inadequate sleep quantity, poor sleep quality and excessive daytime sleepiness because bedtime use disturbs sleep patterns of children and stimulates the brain's production of melatonin.[130]

"I spent 14 hours on the computer in one day learning [a computer game]; I was up until 3am the next day."
Aged 17

Results from a three-year pilot programme in Canada that developed a school-based sleep promotion programme for students, found that children who don't get enough quality sleep are more likely to have excess body weight, poorer diet quality, and lower physical activity levels.[131]

Education
London School of Economics (2015) research found that student performance in exams significantly increased post-mobile phone bans. Specifically, LSE researchers working with a group of low-achieving, low-income students found smartphone use in the classroom exacerbated existing educational inequalities.[132]

Students using phones during class time affect whole classrooms as well as individual academic performance. Daniel Pulliam, author of Effect of Student Classroom Cell Phone Usage on Teachers (2017) found that 87% of teachers were distracted by students using phones. He added that teachers' cognitive processes, such as working memory and the ability to stay focused and maintain awareness, decreased and led to weakened classroom performance.[133]

The opportunity cost of attracting and keeping children online impacts on their creativity, autonomy, memory, sleep and education.

"It is hard to live in a technological society and not get trapped in social media. You find that someone does it so you do too, and after a while you are addicted and miss out on things in life." — Aged 14

When excessive behaviour becomes pathological
Dr. Henrietta Bowden-Jones, Imperial College London, expert on behavioural addictions

"

Some children and young people have a higher propensity towards using smartphones and tablets to excess. This changes over time and is closely linked to resilience as well as the ability to withstand environmental stimuli in a positive and constructive way.

From my experience working with young people who experience significant compulsive behaviours, their inability to manage the amount of time they spend online playing games, watching YouTube or being on social media is often closely linked to emotional states that may feel overwhelming. These are normally negative ones such as low mood, anger, feelings of abandonment and fear of social exclusion.

At times, these behaviours worsen as the young person disengages from previously rewarding activities and relationships in the real world. Someone may stop attending netball team practice or their music lessons and thus cut themselves off from a whole series of nurturing and positive relationships fuelled by shared interests to seek out online relationships with fellow gamers or friends. The more isolated the person becomes, the more likely they are to turn towards online activities to supplement the loss of interaction. Many end up as recluses in their bedroom when their activity has intensified in terms of hours.

There is an ongoing debate as to whether some of these intense compulsive behaviours can be deemed to be addictions. For example, if someone is gaming 14 hours a day, he may be defined as suffering from Gaming Disorder. A young person playing online poker all night may be suffering from Gambling Disorder.

However, there are many more young people who use social media and gaming in an excessive way who, while not addicted, still use their mobile phones and tablets too intensely. This problematic use is often an attempt to navigate the difficulties of growing up in contemporary society.

Driving users to understand the need for screen-free time, for exercise and for real life interactions is part of a stimulus control approach to shaping behaviour that will benefit everyone, whatever their age.

"
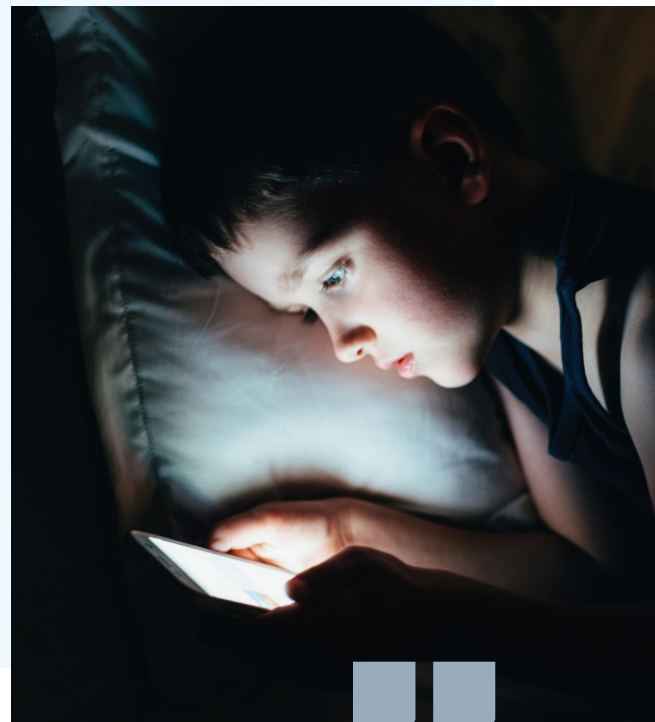
Let's pretend: Creating opportunities to role play
Dr. Angharad Rudkin,
Children's Clinical Psychologist
and Associate Fellow of the
British Psychological Society

"

We are entering unprecedented territory when it comes to parenting children in the digital world. When television first made its appearance in the 1950s there was widespread concern about the effect this would have on the way children learnt and played.

While today's narrative about the digital world is not so full of suspicion and fear, we are dealing with a far more ubiquitous issue with children as young as three-years-old having frequent access to smartphones and tablets.

The research is growing but still lags behind the rapid pace of technological development. What is clear, however, is that we have to understand each child's developmental needs in order to truly get to grips with the opportunities, as well as the risks, of digital engagement.

For example, pretending or role playing is an essential past time for two to five-year-olds. The opportunity to play at being a grown up or to pretend to be a superhero serves an important function in terms of cognitive and social development, of identifying with others and building self-identity.

Vast increases in digital use by pre-schoolers leaves less opportunity for important self-propelled and imaginative play.

The increase in digital play in this age group means that pre-schoolers are engaging in different types and quantity of pretend play, with, as yet, unknown consequences.

"

Prof. Andrew K. Przybylski
Director of Research, Oxford Internet Institute

Most of the rhetoric about risks and harms of a digital childhood is based on a relatively mechanistic understanding of human behaviour, it is concerned principally with nudges and primitive models of influence. This is not fit for purpose. The most promising alternative to this mechanistic thinking is Self-Determination Theory (SDT). SDT provides a motivational continuum that runs from extrinsic motivation, carrot and stick prods, to autonomous self-regulation, **behaviour that is guided by values and interests.**

Decades of *'analogue'* research indicates that autonomous motivation reflects an individual's internal desire to complete a task, while external motivators represent factors outside an individual's control, including rewards that may encourage tasks or punishments that limit them. **Satisfaction from completing a task is higher when young people are autonomously motivated. Quality of engagement across school, social and family is also higher.** Put simply, the more autonomous the motivation, the greater the likelihood that resilience and positive behaviour will be sustained once the external motivator disappears.

If we are going to move beyond the risks and harms framework we will need to replace it with something better. For young people to be autonomously motivated online, we need transparent science, grounded in established psychological models. This will shift us from a reactive to a proactive understanding of digital childhood and provide a framework to fruitfully engage policy, industry, and charity stakeholders in order that children have agency in the digital environment.

4.4 Profiling, personalisation and surveillance

Arguably a persuasive design strategy in itself, personalisation is a powerful tool by which a user is persuaded to extend use.

Algorithms follow user behaviour patterns on such tight loops that they know the *'exact'* personalised mix of strategies that will work for each specific user. When it comes to children, these algorithms collect extremely intimate personal data.

Lawyers Joe Newman, Joseph Jerome and Christopher Hazard explain that the move from standalone games to interactive online games brings with it a significant shift in the ability for game designers to:

"...collect and generate enormous amounts of information about their players, much of which may be considered highly sensitive. This data includes information relating to the real world, ranging from a player's voice or physical appearance to [their] location or social network. It also includes detailed information from the player's actions within the game world, which may be analysed to create in-depth profiles of a player's cognitive abilities and personality."[134]

This loop of data gathering and profiling is a norm across all sectors of the digital environment and creates super-charged personalised profiling, described by Professor Lupton and Dr. Williamson in their paper The Datafied Child as *'dataveillance'*.

Dataveillance (an amalgam of data surveillance) is defined as:

"...the monitoring or evaluation of children by themselves or others that may include recording and assessing details of their appearance, growth, development, health, social relationships, moods, behaviour, educational achievements and other features."[135]

This surveillance codifies presumptions and assumptions about a child's nature, their characteristics and ambitions at a time when children and young people are experimenting with, and exploring, their own identities. Professor Lupton and Dr. Williamson express concern that unless *'scientific neutrality'* is imposed, children's life chances and access to opportunities will be increasingly shaped by *'social sorting'* that has little or no oversight and is constructed to gather highly sensitive personal information that is extremely valuable for marketing and other commercial or as yet unknown purposes.[136]

The power of personalisation and potential for social, personal control is not limited to commercial considerations. For example, in China the government is developing a Social Credit System to rate and rank the trustworthiness of all Chinese companies, legal entities and its 1.3 billion citizens. Data will be collected as users participate both as citizens and consumers. *"The system not only investigates behaviour, it shapes it."*[137]

The complex algorithm that rates citizens has not been divulged, but factors such as credit history, personal characteristics, and behaviour and preferences are all taken into account.

"Putting people into virtual worlds can be incredibly effective at changing their behaviour, and those changes can happen without the person's awareness... What Facebook is today, with where virtual reality might go in the future, could be so destructive of a sense of truth, a sense of free will, the sense of the civil project. It could be really the destruction of us all."[140]
Jaron Lanier, inventor of virtual reality

"The government is attempting to make obedience feel like gaming. It is a method of social control dressed up in some point-reward system. It's gamified obedience."[138]

Device dependence, the formation of hard-to-break habits, feelings of addiction and compulsion are all widely reported by children.[139] There are also questions about the legality, ethics and safety of creating dependence and habits at a time of immaturity and rapid development.

4.5 The near future

There is no single vision of the future of tech, but the ethical and social issues raised by persuasive design will be magnified by the emerging dominance of Artificial Intelligence, Machine Learning and the Internet of Things. This inevitable amplification of impact has led to calls for more oversight. The New York Times journalist and tech analyst, Farhad Manjoo, speaks for many when he says:

"My default position about whether this stuff [technology] is going to be good or bad in the world has changed. So in the past, my reflexive bias of a new piece of technology tended toward optimism… it's going to make us more efficient or help us connect with people and that has to be good… But I think we should all be more sceptical of the unseen and longer-term potential dangers of these technologies before we rush to embrace them."[141]

As the digital environment becomes integrated with the physical environment, users will be automatically plugged in: not merely for extended use, but for permanent use. This will create a *de facto* situation where users are guided through life along algorithmically-determined pathways acting in the best interests of whoever owns or pays to use their data.

The Fridge Problem

Imagine a near future in which refrigerators can sense when a child is hungry and offer snacks based on how much a company has paid for their product to be suggested.

Who has responsibility for the nutritional needs of that child? Parent or carer? The Government? Or the company who controls the data gateway to the fridge? Or should the *'perfect'* nutritional balance be built into the artificial intelligence?

If so, should *'perfect'* be set against income, ethnicity, an ecological footprint, a daily read out of the child's state of health, their family's traditions, ethics of food production, or simply based on what they ate yesterday? What if it doesn't spot the diabetic, a religious dietary requirement, or a life-threatening allergy?

And what if that hungry child yearns occasionally for a chocolate bar but is only ever offered a carrot stick?

Some of the questions raised by the Fridge Problem resemble existing ethical questions. Some are new. But a small set of questions about a smart fridge quickly amplifies into profound questions about self-determination, rights, liability and agency.

The advent of smart homes, smart schools and smart cities, creating a world where your television knows when you have sat down, or where homework is shared with future employers, and a car is designed to decide who to save — you or the pedestrian — at the moment of a malfunction, means that human beings and intelligent machines will have to learn to coexist. But on whose terms?

In this context, the oversight of persuasive design strategies that prime human beings to behave in certain ways becomes an urgent ethical question for policy makers and civil society.

Chapter **5**
Seeds of change

The World Wide Web is little more than a quarter of a century old.[142] Few anticipated its rapid dominance of economic and civic life — referred to as the Fourth Industrial Revolution.[143]

In the UK, the last great industrial revolution of the 19th century saw 17 Factory Acts,[144] and vast swathes of further legislation on town planning, utilities, food safety and child labour, to balance societal needs against the rise of the commercial instincts of a handful of ultra-wealthy, industrial entrepreneurs. These acts included provisions that regulated the hours and welfare of children and young people.[145]

The assets of the digital revolution are less visible and more mobile. Cables and servers transport and store data across the globe blurring jurisdictional lines, making it harder to pinpoint the exact whereabouts of a user's personal data.

Whilst the multibillion-dollar market value of the most successful tech companies points to data as the *'gold'* of the digital revolution each piece is hard to value. The lack of clarity as to where data sits and how much it is worth makes it difficult to find, regulate or tax.

Whilst some continue to assert that these issues and the fast-moving nature of digital innovation preclude effective regulation, there is an increasingly active number who believe that the unfettered commercial freedoms singularly enjoyed by the tech industry create a negative environment and that limits must be set. Including limiting the impact of persuasive design strategies on the choices and outcomes of children and young people.

5.1 Upsetting the Apple cart

Apple's chief design officer Johnny Ive, said that *"constant use"* (by children) of the iPhone was *"misuse"*, yet the device is deliberately designed to extend use.[146]

In January this year, in a blow to Silicon Valley's reputation, two of Apple's largest shareholders, California State Teachers Retirement System and JANA Partners, (who own approximately $2 billion of its stock)[147] sent a letter to Apple[148] outlining their concerns about the damage of device addiction for young people because of persuasive technologies.

The letter, voicing many of the same concerns raised by this report, highlights the persuasive, psychological features of social media sites and digital applications designed to be as addictive and time consuming as possible.

Whilst acknowledging the great potential of the digital world, and recognising the value of responsible usage, the writers, mainly teachers and academics, cite a plethora of negative outcomes of excessive use. The letter outlines the negative effect on children's wellbeing, including increased risk of suicide and depression, conflict with parents and adverse effects on children's cerebral and social development.

The authors found the efforts made by the technology sector to monitor and address the effects of their products on children and young people inadequate and highlight that options provided to parents to address their child's usage are limited and also inadequate.

They urge Apple to set an example for the technology sector about the obligations of companies towards their youngest customers, by investing in enhanced software, and improving research and reporting to support and safeguard young people who will be the next generation of leaders, innovators and customers.

As we go to press, Apple has announced changes to its operating system. We cautiously welcome the announcement but are yet to see how comprehensive the features are. Systemic change however, must still be implemented by all providers throughout the digital value chain.

5.2 The Age-Appropriate Design Code

In 2018, the UK Government introduced an Age-Appropriate Design Code into the DPA. Building on the requirement of the General Data Protection Regulation that provides that *'children merit specific protection'*, the Code will set out what the UK considers to be the high bar of data regulation needed to protect those under 18-years-old. The Code will take into account children's development milestones and requires the regulator (the ICO) to prioritise the *'best interests'*[149] of children when considering what constitutes adequate data protection.

Among the aspects of design to be considered by the Commissioner are strategies that encourage extended user engagement. This is the first time that questions raised by persuasive design will form part of a statutory regulatory framework, offering the opportunity to assess persuasive design strategies and militate their impact on children and young people. Shirley Cramer CBE, chief executive of Royal Society for Public Health, that co-authored #StatusofMind,[150] reacting to the introduction of the Code wrote:

"There is a need for an informed public debate about how we protect children from the coercive and addictive elements of social media and future new technologies. To improve the mental health and wellbeing of our children we need to urgently mitigate the negative impacts of social media and accentuate the positives. The RSPH welcomes the new Age-Appropriate Design Code and believes it should be urgently implemented and rigorously enforced."

As the implications of a *'digital-first'* world become clearer, and the conflicts between Big Tech's commercial imperative and society's established norms are exposed, governments across the world have begun to consider how to apply existing legal principles to the online world, and adapt, enhance and add to legislation to tackle harms, business practices and impacts specific to the digital environment.

The ubiquitous use of persuasive design strategies in the digital environment is an issue that affects almost all UK children.

Whilst the digital environment tantalisingly embodies both progress and the promise of creativity and knowledge, its current dependence on persuasive technology makes it a toxic environment for children and young people that limits opportunity and creativity.

Children are vulnerable to mental health issues associated with identity development, familial and social pressure. The digital norms relating to extended use amplify these pressures and therefore their vulnerability.

It is imperative that for children to engage purposefully and playfully online, the digital environment must be designed with their needs and rights in mind.

The current asymmetry of power between the developing child and the most powerful companies in the world is not in the 'best interests' of the child.

5Rights Foundation wishes to see a global effort to set the ethics, governance and legal boundaries for the global technology companies and those that use technology to engage with children. This issue is bigger than any single nation state, bigger than a single company, and bigger than any single voice.

All stakeholders have a duty to start the process towards ethical design standards of services for children.

The children and young people who contributed to this report and those who engage with 5Rights, want more choice, more control and more peace.

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Authors & contributors

Authors

Baroness Beeban Kidron OBE
Founder of 5Rights Foundation

Baroness Kidron sits in the House of Lords as a Crossbench peer where she is a member of the Communications Committee. She is also a Commissioner on the UN Broadband Commission for Sustainable Development, a member of The Royal Foundation Taskforce on Cyberbullying and a member of the Technical Working Group for the Child Dignity Alliance.

Kidron is the co-founder of charity Into Film, which uses film to educate school children, running more than 9,000 film clubs in UK schools. Before entering the House of Lords in 2012, she spent more than 35 years working as a filmmaker in film, television and documentary.

Jenny Afia
Partner at Schillings

Afia is a privacy lawyer and was Spear's Reputation and Defamation Lawyer of the year in 2015. She has been involved in many landmark privacy cases such as Rocknroll v NewsGroup Newspapers Ltd, which addressed how social media content can be used by third parties, as well as the first civil case concerning revenge porn, JPH v Persons Unknown.

As part of her work on the Children's Commissioner's Digital Task Force, Afia re-wrote terms and conditions for major social media companies, so that children and young people could better understand them.

Alexandra Evans
Chief of Strategy at 5Rights Foundation

Evans is the former Policy Director of the British Board of Film Classification (BBFC) and oversaw the passage of the Digital Economy Act, for which the BBFC will be the regulator. A qualified lawyer, for many years she worked in law firm Mishcon de Reya's public policy team where she advised on a wide range of public interest and human rights law issues.

Contributors

Prof. Joanna R Adler
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Adler is a BPS- and HCPC-registered forensic psychologist. She has been conducting research and evaluating interventions in and around youth justice for more than two decades.

Adler applies both qualitative and quantitative approaches to her research and has conducted several systematic reviews of evidence. Whether exploring how young people respond after victimisation, or considering efficacy of sanctions imposed on those who have offended, her findings have led her to believe that it has never been more important to consider the impact of real and digital blended identities on young people's experiences and development from youth across the lifespan.

Dr. Henrietta Bowden-Jones
Honorary Clinical Senior Lecturer
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Bowden-Jones is the founder and director of the National Problem Gambling Clinic in the UK, the only NHS service (CNWL NHS Trust) designated for the treatment of pathological gamblers. The clinic has been running for ten years. She runs a gambling disorders research group and has been the recipient of Medical Research Council grants and Wolfson Fellowships as well as several prizes and awards. She is a medical doctor, specialising in addiction psychiatry and an Honorary Clinical Senior Lecturer, in the Department of Medicine, Imperial College, where she teaches.

Her current roles include: president elect of the Medical Women's Federation, Royal College of Psychiatrists' spokesperson on Behavioural Addictions, board member of the International Society of Addiction Medicine and member of the Royal Society of Medicine's Psychiatry Council.

Dr. Liam Hackett
Founder and CEO of Ditch the Label

Hackett has founded and grown Ditch the Label into an organisation that helps thousands of people every month. It is now one of the largest anti-bullying charities in the world, and last year alone supported 1.1 million people globally.

Hackett sits on advisory boards across the third sector and governmental departments and has contributed to various academic and government reports at UK, EU and USA level. Working across a multitude of countries and languages, he regularly speaks, debates and contributes articles throughout the press, radio and TV on a range of issues surrounding bullying, cyberbullying, equality, discrimination, gender, self-esteem, masculinity, digital technology and young people. He regularly speaks publicly in places such as The White House, The United Nations, the European Parliament and the Houses of Parliament, in addition to live public events with audiences of up to 12,000.

Anisha Juj
Intelligence Consultant at Schillings

Juj is an intelligence specialist with a wealth of experience in leading investigations, building investigative strategies and providing threat assessments. Having worked in Government, and latterly the financial and legal sectors, she utilises her knowledge of open source and social media intelligence to identify threats and mitigate risks to privacy and security.

Prof. Andrew K. Przybylski
Director of Research
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Professor Przybylski is an experimental psychologist and Director of Research at the Oxford Internet Institute. His work is mainly concerned with applying psychological models of motivation and health to study how people interact with virtual environments including video games and social media. He is particularly interested is integrating open, robust, and reproducible science with evidence-based policymaking in the digital age.

Dr. Angharad Rudkin
Child Clinical Psychologist
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Rudkin (MA (Oxon) CPsychol AFBPsS) is a clinical psychologist and associate fellow of the British Psychological Society. She has worked with children and their families for more than 15 years, using her academic background to provide and supervise evidence-based interventions with families.

Rudkin lectures in child psychology at the Doctorate in Clinical Psychology course at the University of Southampton, supervises research and examines theses. She sits on the editorial board of Clinical Psychology Forum.

Young Scot
5Rights Youth Leadership Group

Launched in February 2018 by Young Scot, the Scottish Government and 5Rights, the Young Scot 5Rights Youth Leadership Group is a diverse group of 30 young people from across Scotland, aged 11 to 19, who champion their rights in the digital world. Building on the recommendations co-designed by the Young Scot 5Rights Youth Commission in their report, *'Our Digital Rights'* (May 2017), the group focuses on investigating how Scotland can realise young people's rights in the digital world.

About 5Rights Foundation

5Rights Foundation takes the existing rights of children and young people as codified by the UN Convention on the Rights of the Child, and articulates them for the digital environment.

The 5Rights are;

- **The Right to Remove**

- **The Right to Know**

- **The Right to Safety and Support**

- **The Right to Informed and Conscious Use**

- **The Right to Digital Literacy**

A digital environment fit for childhood must be deliberately designed to meet the needs of children and young people, while equipping them with the skills and competencies to manage their journey to adulthood in a *'digital-first'* world.

5Rights Foundation works with a unique and interdisciplinary network of child development and mental health experts, computer scientists, academics, policy makers, UX designers, and most importantly, children — who are often our most enlightened partners.

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