

Technology and its Impact on the Individual

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ABSTRACT

As humanity transitions to the Fifth Industrial Revolution, technology is changing the trajectory of human development. What was once science fiction is now science nonfiction due to technological advancement. In this push for perpetual advancement, is humankind trailblazing without slowing down to think about the ripple effect caused by each new milestone? Humanity is entering an era where the biological makeup of a human being alone, will no longer be the sole requirement of being human. The world is now at a critical inflection point where the interventionist power of technology is allowing humanity to forge a path towards a new superhuman race. This begs the question, is DNA a matter of destiny, or is it simply a draft that can be edited?

The unprecedented speed at which technology is changing requires humans to adapt quickly in order to participate in the modern world. It can be argued that in this age of acceleration, humans are all cyborgs – using Google as memory, digital assistants as butlers, and smartphones as minds. With this influx of technological innovation comes a critical tradeoff between the access to the convenience that technology offers, and the forfeiture of personal data required to participate. This tradeoff creates the conundrum of control between individuals and technology, and the corporations behind it. Collectively, does humanity really understand the extent to which technology controls us?

Technology's impact on biological evolution and the conundrum of control are inevitably evolving three key parts of what makes us human – the mind, the heart, and the body. The world is changing quickly, but are humans truly internalizing, understanding, and accepting the power and perils of technology and its ramifications for humankind? Who should determine the future of human evolution?

This academic paper explores: (1) the human mind and how technology is impacting human cognitive development, mental health, worldview and (mis)perception of control, (2) the human heart and how the relationship with oneself and with others is evolving in the digital era, and (3) the human body and how tech is shifting the perception of one's physical and digital self and the future definition humanity. We are at a pivotal point in human history where we must collectively choose to seize control of technology instead of letting it control our fate. In order to seize control of our destiny, we must leverage backcasting to put our collective wellbeing at the center, and dictate what we want to see as the future trajectory of humanity. In order to solve the conundrum of control between technology, its gatekeepers, and the individual, we must take three measured steps towards that vision: drive mass awareness through structural change, actively invest in our own humanity, and end the Bystander Effect. The three key parts of what makes us human – the mind, the heart, and the body – remain at the center of this vision as we move from (mind)less to (mind)ful, (heart)less to (heart)beat, and no(body) to every(body).

INTRODUCTION

The future is now, but it is not everywhere. In an era where technological advancements have transformed science fiction into science nonfiction, the very concept of evolution has evolved itself. Is DNA a matter of destiny, or has it become a working draft that is subject to human editing? As with all other species, human beings are the product of millions of years of evolution. The world is at a pivotal inflection point, where DNA and natural selection are met with the interventionist power of technology created by humans. A genetic mutation can take hundreds of thousands of years to spread in the human race, bound by the limitations of human reproduction and time (Valiño, 2017). Whereas, tech innovation can spread in days, if not hours. Biological evolution may not be entirely replaceable, but how will it be augmented with human-led adaptations enabled by technology? Some human beings today are living in a world of gene therapy, molecular medicine, biohacking, and rapid technological advancement. We are now establishing a time where the natural occurrence of human genetic makeup is treated as a draft that can be edited. On the contrary, less developed parts of the world are confined to a reality where DNA is determined by destiny. Has humankind reached a point where the speed and technological advancement of modern life have outpaced biological evolution?

Cyborgs were originally defined in the 1960s as “fictional or hypothetical person(s) whose physical abilities are extended beyond normal human limitations by mechanical elements built into the body” (Cyborg, 2019). Today, cyborgs are no longer fictional, and have become a reality. The world’s first legally recognized cyborg, Neil Harbisson of Spain, implanted a microchip into his skull, anchoring an antenna-like fiber optic sensor that hovers right above his eye. The sensor converts color frequencies into vibrations in his head that become sound frequencies to help him perceive color in his biologically color-blind world (Valiño, 2017). In 2015, Harbisson’s technological enhancement marked the point where hypothetical cyborgs became a recognized reality (Barfield and Williams, 2017). Today, it could be argued that all participants in the modern world are cyborgs, with smartphones as appendages that expand our human knowledge to a point of being almost limitless through access. In a world where Google is our memory, digital assistants are our butlers, and calculators are our mind, where does genetics end and technology begin? As a product of genes, culture, and technology, are we redefining what it means to be human, and forging a path to a new superhuman race? With the ability to improve our physical skills and add depth to our intellectual range, evolution has moved far beyond its genetic limitations; it has empowered those at the forefront of technology to help define the future of the human race.

The unprecedented speed at which technology is changing, requires humans to adapt quickly in order to participate in the modern world. In spite of mass early adoption of technology, 91% of Americans aged 18 - 60 are concerned about its impact on future generations (FIT CFMM, April, 2019). With the capacity and cultural expectation to be constantly connected, the ability to control time becomes increasingly important. Constant connectivity yields the power to pack massive amounts of information and productivity into every day, and thus, time has become our most valuable commodity (Harris, 2017). With digital voice assistants

like Amazon Alexa and Google Home, ride-sharing apps like UBER and LYFT, virtual doctor visits, and beyond, people utilize technology to help streamline and automate their lives. The influx of “smart” and “connected” products provide companies with a new, unobstructed stream of behavioral data that flows straight from living rooms to their databases (Zuboff, 2019). Thus, a critical tradeoff exists between access to the convenience and entertainment that technology offers, and the forfeiture personal data required to participate. This tradeoff is the conundrum of control between individuals and technology, and the corporations behind it. If brands can understand our cognitive constructs through tracking and monetizing our behavioral data, are we still in control of our actions, or are they?

In today’s era of information overload, our inherent need to simplify creates the demand for a “filter-it-for-me” culture, in which algorithms and Artificial Intelligence (AI) do the critical thinking for us. Algorithms are constantly making personalized choices in the background when it comes to the news and content we read, the people with whom we connect, and the goods and services we buy. Algorithms and AI shape our perception and worldview, but do we really understand the extent to which we are controlled by technology? Algorithms serve us inherently biased content, based on our likes and dislikes, where we transact, and what we have interacted with previously. What are the immediate and long-term implications of this background decision-making? Is AI narrowing of our perspectives and perception of the world? Consumers are now overserved information to a point where differentiation between what is important, newsworthy, and real is often no longer decipherable. Does more personalization mean we lose the ability to formulate an unbiased point-of-view? The future of personalization means human judgement and decision making run the risk of being hijacked. If human beings lose the capacity for critical thinking and the ability to evolve our own ideas, we become more vulnerable to the AI algorithms we created. In the near future, will humans have a perception of control, but in reality, relinquish full control to AI? Are we giving up the freedom to define our own humanity?

Technology’s impact on biological evolution, the conundrum of control, and “filter-it-for-me” culture are inevitably re-shaping what it means to be human. The seemingly inseparable integration of technology into everyday life affects the way we operate as humans. From the way we think, to the way we feel, to the way we behave. Technology impacts the way in which our brains develop, process and respond to information, and the way in which we interact and relate to ourselves and others. In a more physical sense, digital is influencing our perception of beauty and our definition of what it means to be beautiful. With clear positive and negative implications of technology, it is important to highlight both the possibilities and perils of technology for the individual as part of a rapidly evolving, technologically-advanced society. While tech innovation enhances certain aspects of the human experience, at what point will genetically-altering flaws and limitations take us to a point of no longer being human? When do we leave traditional humanity behind and enter a new generation of superhumans? Individuals now have the power to change fundamental elements of what it means to be human through access to technology, but who should be in control of this evolution? The conundrum of control and access to technology affect three key parts of what defines us as human – the mind, the heart, and the body – all

equally, but differently, with clear implications for the present and future of humanity. We are entering an era where the biological makeup of a human being alone, will no longer be the sole requirement of being human.

HUMAN MIND

We are living in an age of acceleration. As technology advances at what feels like a faster rate, we have become both overstimulated and inundated with information in a digitally connected world. As humans, how are we coping with these advancements? In just 30 years, our lives went from analog to digitally addicted. Technological breakthroughs that felt unachievable in our lifetime just a few years ago, are now at our doorstep. Our world is changing quickly, but are humans truly internalizing, understanding, and accepting the power and perils of technology and its ramifications for humankind? In the push for perpetual advancement, are we trailblazing without slowing down to think about the ripple effect each new milestone brings? This section explores the human mind and how technology impacts our cognitive development, mental health, worldview and (mis)perception of control.

A New Developmental Trajectory

iGen, made up of Gen Alpha and Gen Z, is the first digitally connected generation since birth. With the introduction of technology in early childhood, the trajectory of human development is changing, and Gen Z has become a generational experiment as to exactly how. Our methods and style of communication, linguistics, cognitive thinking and brain development are evolving as screen time increases and exposure to such devices begin at a younger age. Childhood adolescence has shifted from a physical world filled with toys and human interaction, to a virtual playpen with screens and intangible games. As this digitally connected generation grows up, we are just beginning to understand the long-term implications of increased device usage and screen time on cognitive development. Digitally native generations will drastically shift our notion of what we define as human and the role of the individual within society, in years to come.

While technology has the ability to make our lives easier and more efficient, these shortcuts and instant connections also bare less idealistic, negative consequences. Studies on screen addiction and its impact on cognitive development are relatively new, given the launch of Apple's iPhone was in 2007. While the lines of addiction are still blurred, research is beginning to show that even children with 'normal' or 'regular' screen time are at risk of damaging their brain. Researchers are now uncovering significant implications on cognitive development and overall mental health, especially in young children when the brain is still developing. The American Academy of Pediatrics' (2016) *Media and Young Minds* policy, "addresses the influence of media on the health and development of children from zero to five years of age, a time of critical brain development, building secure relationships and establishing health behaviors." The AAP concludes, there is limited evidence that children under two actually benefit from media. For children younger than 18-months, the AAP recommends avoiding the use of screen media (e.g. cell phones, tablets, TVs), other than video-chatting. For babies 18-

months and older, the AAP urges parents to limit screen time to less than an hour a day, and only high-quality programming (e.g. Sesame Street and PBS) with adult interaction. The AAP (2016) also emphasizes that adult interaction with the child during media use is crucial, because infant development requires “hands-on exploration and social interaction with trusted caregivers to develop their cognitive, language, motor and social-emotional skills.” Today, we are failing to recognize that infants and toddlers are unable to learn from traditional digital media as they do from interactions with caregivers. These developing humans struggle to transfer digital learning to their physical experiences due to underdeveloped symbolic, memory and attentional skills (American Association of Pediatrics, 2016).

Further research conducted to understand the impact of screen time on cognitive structure uncovered five key areas, and functions of the brain, affected by increased device usage: gray matter atrophy, comprised white matter integrity, reduced cortical thickness, impaired cognitive functioning, cravings, and impaired dopamine function. Gray matter, where information processing occurs, has shown shrinkage or loss of volume in many studies on people with internet or gaming addictions (Zhou 2011, Yuan 2011, and Weng 2013). Excessive screen time also impacts the frontal lobe of the brain, where organizing and planning occurs, as well as the striatum, which helps keep negative impulses at bay. Damage to the insula was also documented, which aids in our ability to empathize with others. The loss of white matter impacts the ability of different areas of the brain to communicate with each other, including the right and left hemispheres, and the cognitive to the emotional portion of the brain. Overall, cognitive function is impaired, thus inhibiting a human’s ability to efficiently process and understand information. Contrarily, only 10% of people shared in a survey that technology would have a very negative impact on cognitive thinking skills (FIT CFMM, April, 2019). Research on gaming also shows the release of dopamine during the activity, resulting in addictive behavior, similar to that of drug addicts (Han, 2011).

A key implication of excessive screen time is that we are placing a physical handicap on a generation of rising adolescents. Neurodegeneration, usually observed in the brain of an elderly person, is now occurring in the developing brain of an adolescent. Consider the breadth and depth of this physical handicap: we are impairing a child’s ability to think critically, process information and express emotion. Physically, excessive screen time is associated with poor sleep and risk factors for cardiovascular disease, impaired vision and reduced bone density (Lissak, 2018). Psychologically, it is associated with depressive and suicidal symptoms as well as ADHD-related behavior (Lissak, 2018). And lastly, psychoneurological effects include brain structure changes related to cognitive control and emotional regulation, decreased social coping and craving behavior, resembling substance dependence behavior (Lissak, 2018). The risks and implications are now being documented, yet counterintuitively, we have increased our reliance on technology, in the classroom and at home, to help aid cognitive development amongst children. The applications meant to help children perform better in school, may end up eroding their cognitive capabilities in the long-term and stunt developmental potential. This in turn, will increase our future reliance on technology to help compensate for diminishing brain function,

making the human race more vulnerable. The role of technology could change drastically for the individual, from a nice-to-have today, to a necessity in the future. Our blind adoption of technology has introduced a new set of frightening and permanent limitations for iGen, which will only be fully realized and understood as time progresses and the physical, psychological and psychoneurological effects reach a point of maturation.

Mental Health & Psychological Impacts

In addition to the physical impairments to the brain's structure and function, too much screen time has also resulted in mental health and behavioral consequences. Excessive screen time across devices is constantly overwhelming humans with information. This in turn, is causing a sensory system overload, fracturing attention, and constantly depleting our mental reserves. The Radiological Society of North America (2017) supports this notion with a study that found sensory overload from digital addiction is often behind depression, anxiety, impulsivity, and aggressive behavior. Technology is greatly affecting the way we process information and hindering our ability to react appropriately to our environment and various stressors. In addition to impairing our brain structure and function during the crucial development years of adolescence, screen time addiction is becoming more pervasive around the world and has the ability to drastically change human interpersonal communication and our ability to connect and relate to one another.

When any form of addiction develops in a child or adolescent brain, versus in adulthood, the lifelong effects become amplified. Neuroscience research finds that one is more likely to become addicted to a substance if she/he start using as an adolescent. At least 80% of people who have a substance abuse disorder started using before they were 18 years old. Neuroscientist, Judith Grisel, explains that “changes in behavior that happen during adolescence are so important and lasting because the brain is forming permanent structures...when the circuits are being laid down, if they're laid down under the influence of a drug then they're going to be laid down differently than if it's not under the influence of a drug. If you start using at 28 when the circuits are already more or less set, then you're not going to have such a long-lasting impact [than if you were 18]” (Gross, 2019). Both screen time and drug addiction have the capability to rewrite a child's brain pathways in a similar fashion. The risks associated with any form of addiction must be carefully considered with equal weight.

Alongside technology's impact on a child's developing brain pathways, a strong correlation has emerged with suicide and depression. A study conducted by Jean Twenge, PhD, lead author of the book *iGen*, and Professor of Psychology at San Diego State University, reports that “teens who spend more time on screens in the form of social media, internet, texting, and gaming thought about suicide a lot more than kids who didn't. About 48% of those who spend five or more hours a day on their phones had thought about suicide or made plans for it, versus 28% of the teens who spend only one hour per day on their phones” (Walton, 2019). In a March 2019 press release, the American Psychological Association (APA, 2019) noted that the percentage of teens and young adults with serious psychological distress, major depression or

suicidal thoughts have significantly increased over the past decade. The same pattern was not observed in adults 26 and older. “The rate of individuals reporting symptoms consistent with major depression in the last 12 months increased 52% in adolescents from 2005-2017 and 63% in young adults age 18-25 from 2009-2017. [Furthermore], the rate of young adults with suicidal thoughts or other suicide-related outcomes increased 47% from 2008-2017.” Our use of digital media and new modes of electronic communication play a role in this trend, increasing the prevalence of mood disorders and contributing to these staggering mental health statistics. Dr. Twenge urges people to “make sure digital media use doesn’t interfere with activities more beneficial to mental health, such as face-to-face social interaction, exercise and sleep” (APA, 2019). From a psychological standpoint, unmitigated digital media usage is jeopardizing our collective wellbeing, and the implications are amplified for teens experiencing emotional distress. For example, searching #suicide on a digital platform provides endless results to young, impressionable and vulnerable teens. “We have allowed content that shows contemplation or admission of self-harm because experts have told us it can help people get the support they need...but we need to do more to consider the effect of these images on other people who might see them. This is a difficult but important balance to get right” (Mosseri, 2019). As rates of suicide and depression rise, we must put safeguards in place to help protect at-risk teens and adolescents. How do we protect this vulnerable group from being bombarded with information online about suicide and self-harm? Can we protect our right to self-expression and free speech, while filtering out harmful information and retain parts that can potentially help others in need? Not only does this sensitive issue have broad implications for censorship and freedom of speech, the steep decline in our youth’s mental health has major industry and societal implications as well. The pharmaceutical industry is poised to become even more powerful if our reliance on antidepressants and anti-anxiety medication intensifies. If mental health disorders increase and continue to go untreated, the opioid epidemic currently plaguing the U.S. could get worse. All of which, drastically affect and touch every aspect of society - from the economy, GDP and labor market to an individual’s health, personal relationships and family unit. Counter to this trend, the wellness movement will grow more powerful and take center stage both personally and professionally. Companies will need to make mental health a greater focus, impacting the future of employee benefits.

While screen time and tech addiction hinder our ability to process information and contribute to higher levels of anxiety and depression, the mental health field is also utilizing innovations in tech to help people abate these effects. The anxiety-inducing devices we use on a daily basis can also help facilitate the diagnosis and treatment of mental health disorders. Leveraging technology can also lower the barrier to entry when it comes to treating mental health conditions. Using a smartphone as a buffer can help reduce the stigma some people attach to mental illness. This fear of stigmatization often deters people from seeking mental health services and technology allows for an added layer of privacy in treatment (Insel, 2018). Technology also makes seeking treatment more accessible. A person can leverage apps to improve their mental health, whether it is tracking their mood, meditating or communicating 1:1

with others. Seeking treatment and making strides towards a healthier lifestyle can be less burdensome and more actionable with the help of technology. On the practitioner side, apps can be leveraged to track patient process, pinpoint moments of crisis and personalize patient care plans (Anthes, 2016).

Artificial intelligence is also emerging as a key innovation aiding the mental health field in providing better access to treatment. AI is helping to reduce stigma through its inherent anonymity. Individuals, who are either embarrassed or apprehensive about speaking to a mental health practitioner in person, may feel more comfortable confiding in AI-based tools (Yu, 2018). In terms of access, video-based therapy and AI services remove the physical constraints of seeking treatment. 40% of people in the U.S. live in an area that lacks mental health practitioners, while psychiatrists are unavailable in sixty percent of U.S. counties (Garg, 2017). While technology can improve access to care, it also raises questions about the quality of care. AI allows medical professionals to care for a larger number of patients, and in many cases, help them make better diagnostic decisions, improve treatment outcomes and reduce medical errors. However, AI cannot replace the power human connection and empathy. Therefore, technology and AI should be used as a cognitive assistant, rather than as a replacement for the human physician.

Science Non-Fiction: Addictive Code & Brain Hacking

What is the driving force behind our need to be connected? As smartphone, social media and gaming addictions rise, are we fully in control of our own behavior or are external factors at play? As the sheer volume of information increases exponentially across our devices, we are experiencing information and sensory overload and consequently, our attention span suffers greatly. Since human consumption of information is finite, in today's digital world, brands and companies are fighting for our 'three seconds of attention.' Attention is now a scarce commodity and while most companies leverage data to target relevant audiences, digital platforms and software companies are taking it a step further and leveraging algorithms and user-interface design to keep consumers engaged. An underbelly of addictive code fuels this attention economy to ensure consumer screen time does not dissipate. The Center for Humane Technology (in Levine, 2018) states, "There's an invisible problem that's affecting all of society. Facebook, Twitter, Instagram, and 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."

Human beings have become dehumanized to corporate entities. Consumers are now viewed as a pool of rich data to be collected, exploited and monetized. For example, a leaked internal Facebook report reveals, "the company can identify when teens feel 'insecure,' 'worthless,' and 'need a confidence boost.' Such granular information is a perfect model of what buttons you can push in a particular person" (Lewis, 2017). In extreme cases, tech companies can

exploit these vulnerabilities to manipulate and control consumer behavior within their algorithm. This raises the ethical question, when does engagement cross over to addiction?

Using technology to affect an individual's mental state or manipulate behavior without their knowledge or consent is known as "brain hacking." Technology giants and startups alike use brain hacking to understand our individual cognitive constructs and these companies leverage this knowledge to keep consumers hooked. For example, "variable reward" is a highly addictive feature leveraged across mobile, exploiting the same psychological vulnerability seen in compulsive gambling. One of the most addictive and ubiquitous mobile design features is "the pull-to-refresh mechanism, whereby users swipe down, pause and wait to see what content appears. 'Each time you're swiping down, it's like a slot machine. You don't know what's coming next. Sometimes it's a beautiful photo. Sometimes it's just an ad'" (Lewis, 2017). Instagram's algorithm knows its users so well it can predict which specific actions, such as pushing likes in one burst versus spreading them out, will be most successful in keeping users engaged (Brain Hacking, 2019). By understanding how the brain handles addiction, engineers are building software knowing when and how to stimulate that part of the brain (Brain Hacking, 2019). Numerous tech executives, who built addictive code, have regretfully come forward to share that it was not created with malicious intent, but rather to connect people and positively impact society. These outspoken executives recognize that in reality, addictive code has done more harm than good. Given the developmental and psychological consequences of screen time and tech addiction, should a legal mandate be in place to make consumers aware of a digital platform's addictive nature and how personal data is manipulated without their consent? If companies have the ability to understand our cognitive constructs, are we still in control of our digital actions, or are they? How can we empower ourselves to understand what type of screen time is benefitting vs. hindering cognitive abilities?

One notable call to action was a 2018 petition to the American Psychological Association by Dr. Richard Freed, psychologist and author, along with 200 other psychologists. The petition called to expose and end "persuasive design," for example, Instagram feeds refreshing like a "slot machine," YouTube automatically playing the next video in sequence – in tech platforms for children (Bowles, 2018). This call to action confirms that there is need for legislation to regulate the technological landscape. Legislatively, if we mandate transparency about addictive code or limit it altogether, digital commerce as we know it today will shift radically. This will impact every single company that engages with consumers online. Companies advertising on platforms that leverage addictive code will be forced to not only disclose this information to consumers, but perhaps reconsider or eradicate these strategies altogether. From a consumer perspective, platform usage could shift and with increased awareness about addictive code, they could exert more pressure on tech companies and brands alike to change their approach and view them as humans rather than a pool of data to be monetized.

Filter-It-For-Me-Culture

In an era of information overload, consumers are easily bored and inclined to focus on topline information and less likely to engage in order to gain a deeper understanding (Meyers, 2018). With the journalism overhaul of Twitter, bite-sized, reactive information is the new norm (Ingram, 2018). With unlimited access to information, there is an increasing consumer desire to control their overwhelming newsfeed. This desire to control and streamline information overload, creates a culture in which information is filtered specifically for the individual. Through data tracking capabilities and artificial intelligence algorithms, personalization is becoming more prevalent across many channels of business. Personalization is undoubtedly powerful; however, it is unclear whether this power benefits or harms the individual. In the example of journalism, news consumption today is in real time, on-demand, across multiple platforms, and personalized to an individual's interest and past behavior. Major players such as Google, Facebook and Apple use multiple techniques to feed news tailored specifically to the individual. For example, Google pairs an individual's geographic location, demographic information and search history to systematically choose what populates the results page when searching for any given topic. Facebook allows users to choose which organization's stories populate their news feeds, while simultaneously using machine learning to create ultra-personalized news products. Apple News allows users to decide which topics and outlets interest them the most, while Siri, in partnership with Safari, uses an algorithm to better understand user preferences and suggest news stories based on search history and digital engagement (LaFrance, 2017).

Such personalization has positive implications on business, allowing different media outlets to attract consumers with tailored, relevant content and keep them coming back. Yet, with a narrow scope of information being fed to the individual based on predisposed beliefs, opinions or interests, personalization can encourage filter bubbles, and in turn, bias and uniformity of thought (LaFrance, 2017). The Atlantic's Franklin Foer, author of *World Without Mind: The Existential Threat of Big Tech*, agrees. He criticizes Facebook for producing a "garbage ecosystem" for news and information, which "weakened our intellectual defenses" and has made the U.S. vulnerable to demagoguery. Foer is highly critical of the unmitigated way in which these companies provide data-driven, personalized news: "Our data is this cartography of the inside of our psyche. They [Google and Facebook Inc.] know our weaknesses, and they know the things that give us pleasure and the things that cause us anxiety and anger. They use that information in order to keep us addicted. That makes these companies the enemies of independent thought" (Johnson, 2018).

Beyond machine learning and algorithms, voice-activated AI digital assistants will redefine the relationship between information and individuals (LaFrance, 2017). With the use of digital assistants, the invisible algorithm now has a voice, and more noteworthy, a personality. Amy Webb, Adjunct Professor at the New York University Stern School of Business and founder of the Future Today Institute, warns that the internet still allows options, yet the digital voice ecosystem is built to serve the specific information the user wants in a pleasing way

(LaFrance, 2017). The continued sophistication of digital assistants' ability to learn about the individual and narrow the scope of the content it serves accordingly, will be detrimental to both diversity of thought and objectivity.

Alarmingly, there is a widespread ignorance to the implications of personalization algorithms powering content across platforms. "Facebook and Google are constantly organizing things in ways in which we're not really cognizant, and we're not even taught to be cognizant" (Johnson, 2018). A 2017 study from Towson University, found that a majority of college students were completely unaware of the algorithms that are used to serve personalized content on Facebook and Google (Powers, 2017). Specifically, 24% of students did not know that Facebook hides and prioritizes posts on an individual's feed, and 25% did not know that Google search results could vary between two individuals searching for the same content at the same time (Powers, 2017). This lack of awareness contributes to an individual's inability to actively choose what information she/he would like to see. A major consequence of personalization fueling a narrower view of the world is a lack of humanity and understanding when it comes to individuality and respecting the opinions of others, thus profoundly affecting our interpersonal relationships. Elia Powers, the Assistant Professor of Journalism behind the Towson study notes, "There needs to be more transparency [by platforms and media outlets] about what data they're actually collecting, and how people can manually turn [personalization efforts] on or off or affect what they see" (Powers, 2017). A consequence of our collective ignorance when it comes to personalization tactics, will be the perpetuation of bias and uniformity of thought.

Concurrently, an inherent bias is built into AI algorithms due to the lack of diversity of the programmers developing them. As our reliance on AI algorithms grow, the likelihood that biased AI systems become a widespread issue also increases. Leveraging AI is only as good as its foundational data, which unfortunately is prone to pre-existing human bias. A ProPublica study found that, "an AI algorithm used by parole authorities in the US to predict the likelihood of criminals reoffending was biased against black people...and the system overestimated the likelihood of black offenders going to commit further crimes after completing their sentence while underestimating the likelihood of white offenders doing the same" (Marr, 2019). While democratizing AI "has the potential to do a lot of good, by putting intelligent, self-learning software in the hands of us all," there is also a danger that "without proper training on data evaluation and spotting the potential for bias in data, vulnerable groups in society could be hurt or have their rights impinged by biased AI" (Marr, 2019). IBM is one company taking steps to alleviate this issue by building automated bias-detection algorithms, trained to mimic human anti-bias processes (IBM Research). The complete elimination of inherent bias will require more formal regulation that sets strict parameters for AI to function in the most ethical way. We must also democratize the regulation and oversight of AI ethics, where everybody plays a role and a few select individuals do not shoulder the burden alone. This will require governmental intervention so humanity's best interest remains at the center, instead of allowing corporate entities to drive the agenda.

Uniformity of thought can have dangerous implications on the individual and on society. Judith Donath, researcher affiliated with Harvard's Berkman Klein Center for Internet & Society, and author of *The Social Machine: Designs for Living Online*, states, "You get news that is designed to be palatable to you. It feeds into people's appetite of expecting the news to be entertaining ... [and] the desire to have news that's reinforcing your beliefs, as opposed to teaching you about what's happening in the world and helping you predict the future better" (LaFrance, 2017). With a narrower scope of news, comes a narrower scope of people with whom one shares common ground, and thus, higher polarization and tension within society. Even traditional news outlets, such as the New York Times, use consumer data to feed information that will be the most emotionally arousing and garner the highest click-through, prioritizing financial gain. In Jill Abramson's 2018 book, *Merchants of Truth*, she reflects on this fact, stating, "Given its mostly liberal audience, there was an implicit financial reward for the Times in running lots of Trump stories, almost all of them negative" (Johnson, 2019). When companies leverage personalization and inherently-biased AI to boost profits, diversity of thought is sacrificed, which is an unintended yet harmful consequence for our collective society.

(The Loss of) Mind Control

Through addictive code and brain hacking, humans are manipulated without consent, and lose control over their own decision-making ability. As AI becomes more sophisticated and powerful, questions arise about the potential of computers to overpower the human mind. Mind control technology takes human manipulation to new heights. Brain-machine interfaces (BMIs), have been previously used to form a connection and information pathway between the human brain and external machines, such as a computer. Neuroscience researchers in China have recently developed the next evolution of mind control technology with a brain-brain interface (BBI). This study connected the human brain with a rat's brain, utilizing BMIs to use the human brain to guide rats through a maze. In this study, an electroencephalogram (EEG) machine was connected to the human's head. The EEG machine captured brain signals and transferred the EEG data to an external host computer. The computer translated these signals into instructions (such as turn right or left), and sent them to a stimulator on the rat's back, then transferred to the rat's brain (Zhang et al., 2019). This new study demonstrates the future potential of human mind control. While this technology offers many exciting applications, does it also pose invasive or unethical ones as well?

In the future, it is predicted that we will be virtually connected to computers and other technologies that will continuously feed us information on an ongoing basis as needed. For example, neurosynaptic computer chips are becoming a reality as their development progresses. Neurosynaptic computer chips, machines that mimic the neurons and synapses of the brain, has the potential to store, learn and remember things the same way real brain cells can (Kiger, 2012). Another type of brain hacking innovation is the Halo Headset, which was invented by neuroscientist Daniel Chao. He developed a headset that "hacks your brain with electricity so you can learn as fast as a kid again" (Fake, 2019). This innovation helps improve motor skills or

“muscle memory,” which can be applied to a myriad of tasks and skills. This type of technology has the power to “retune the brain circuits – potentially to treat disease, potentially to extract more performance out of otherwise healthy people” and the founder’s aim is to develop “neuro-stimulators that could be wearable” versus surgically implanted (Fake, 2019). Applying this technology to improve and speed up adult learning would be a tremendous win for the individual, but who should really be in control of how, when, and by whom, this technology is used? The rise of wearable neuro-stimulators will not only create an entirely new segment of consumer goods, it will also exacerbate the divide between those who can afford these new advancements and those that cannot. The implication is a widening inequality gap and the magnification of key elements that contribute to that gap, such as education and intelligence. Additionally, this new sector will make us more susceptible to rogue actors, those who exploit or manipulate this technology, meant to enhance our human capabilities.

While these new technologies allow us to “perform” better, neurosynaptic computer chips skip the critical cognitive processes that allow us to learn, a major component of what makes us human. Will AI soon be able to fully replicate human brain activity and will our over-reliance on technology make humans too vulnerable? If so, what will make us uniquely human in the future? On the other hand, an innovation like Halo helps fine-tune the human brain and improve its function, but how can we safeguard humanity against the abuse of this new technology? Will granting individuals the ability to enhance their own brain function result in a new race of superhumans? Who is responsible for putting checks and balances in place when it comes to technological innovation that can drastically manipulate the trajectory of human evolution? Control is shifting from humans to technology, and this, coupled with the impairment of cognitive development due to excessive screen time, may permanently destruct our ability to think critically, empathize with others and communicate on the most basic of levels. Will neuro-enhancing wearables, substances and applications make up for these deficits and replace the core of what makes us human? Who is really in control of our future?

HUMAN HEART

Technology is radically shifting the development and structure of the brain, and it is adversely impacting us physically and psychologically, but how is this impacting our interpersonal relationships? As our communication and connections shift from offline to online, are we replacing real-life relationships with digital ones? This section explores how the relationship with one’s self and with others is evolving in the digital era, the detrimental effects technology is having on our ability to understand emotions and develop empathy, and the implications for human identity.

Evolving Relationship with Self

As technology is reshaping the landscape of our minds, it is also reshaping the landscape of our hearts. Today, our relationship with ourselves and with others is impacted by the degree of control that technology offers us, specifically in relation to time and how we represent ourselves.

In our efforts to connect, we neglect the self and bypass relationship fundamentals with others. We ultimately perpetuate the very feeling of loneliness we are frantically trying to avoid. Social Psychologist and Author, Sherry Turkle argues that, “constant connection is changing the way people think of themselves. It's shaping a new way of being” (Turkle, 2012). The omnipresent, consuming nature of our digital devices is decreasing our capacity for solitude and separateness (Turkle, 2012). This internal space between the world and us is necessary for self-reflection and to collect ourselves. While addictive code and brain hacking have detrimental effects on the brain, it is also quite literally the enemy of contemplation. Our ability to think critically about the world, and about ourselves, is diminishing as we lose ourselves to our devices. When we let our minds wander (not down our Instagram feeds), they take us to new ideas, parts of ourselves, and unexpected places. It is in this space that our most human aspects flourish, such as creativity and our capacity to dream (Gallo, 2019). This mental space enables individuals to make some of the most significant human contributions to society – like ingenuity and entrepreneurship.

Paradoxically, learning to be alone is the very skill that will help us feel less lonely, yet we are failing to cultivate this capacity in our youth (Turkle, 2012). Cal Newport, Professor of Computer Science at Georgetown University and author of *Digital Minimalism: Choosing a Focused Life in a Noisy World*, agrees: “Yes, it’s scary not to be [digitally] distracted, but I think it’s even more scary to avoid all of the deep good that comes from having to just be there with yourself, and confront all of those difficulties and opportunities that entails” (Skipper, 2019). Psychologist, Dr. Lapointe (2017) explains, “Children need to sit in their own boredom for the world to become quiet enough that they can hear themselves. It is only when we are surrounded by nothing that something comes alive on the inside. The constant stimulation of today's reality makes arriving at that place of stillness really challenging for a lot of kids. Screens are everywhere and become a mind-numbing outlet.” Teenagers today are digitally connected but often physically alone. The overall wellbeing of Gen Z has declined compared to teens from prior decades and studies suggest that an overuse of screens contributes to diminished wellbeing (Brooks, 2018). Teens who spend 3 hours a day or more on electronic devices are 35% more likely to have a risk factor for suicide (Twenge, 2017). The mental health of GenZ and Alpha are at stake in the new adolescence marred by constant connection. As our youngest generation turns inward, they are failing to engage in meaningful self-reflection, confronting and understanding what they want out of life and using this reflection to help shape their own future. Parents must be more knowledgeable and vigilant about the effects of excessive screen time and understand the warning signs of emotional distress. Collectively, will we wake up to the crisis unfolding before our eyes? When we finally reach the tipping point, at least one generation will be too foregone, suffering the intellectual and emotional consequences of unregulated device usage. iGen, a significant portion of the adult population, will have the highest rate of mental health disorders, causing society and companies to shift its attention and resources towards rectifying the damage done years ago and remedying it for future generations to come.

Evolving Relationship with Others

Our new developmental trajectory is changing the nature of our interpersonal relationships and with the rise of social media, humans are now replacing real-life relationships with digital ones. Most importantly, the lack of face-to-face communication, spending physical time together and the overuse of devices, are having a detrimental effect on our ability to understand emotions and develop empathy. The Yale Center for Emotional Intelligence shares the importance of children's capacity to respond to emotions, which can either enhance or hinder the development of the whole child. It goes on to explain that "social and emotional learning (SEL) refers to the processes of developing social and emotional competencies, which depend on individuals' capacity to recognize, understand, and manage emotions." Competencies in social and emotional skills are critical for an individual's overall well-being, and quality of relationships (Nathanson, Rivers, Flynn, Brackett, 2016). The head of Yale University's Center for Emotional Intelligence, Marc Brackett, says (in Johnson, 2014) that our "ability to understand and catalogue emotions is more important than ever since the advent of the internet, social media, and texting." Famed Harvard Psychologist, Howard Gardner, and expert of the impact of digital media technologies, Katie Davis share in their book, *The App Generation: How Today's Youth Navigate Identity, Intimacy, and Imagination in a Digital World*, that the digital revolution encourages superficial relations with others. Researchers are finding that although the volume of communication with family and friends has increased with texting and social media, we are now living in a culture of soundbites and the quality of our communication has diminished (Gardner and Davis, 2013). This shift in how we maintain relationships has a much deeper effect on us emotionally. In addition to the cognitive impairment and structural changes to the brain, children that spend more time glued to their screens, rather than interacting with people, have a difficult time developing verbal skills, understanding different emotions and building relationships (Gardner and Davis, 2013). Technology has the power to rewrite a child's brain pathways. This is now exhibited through changes in concentration, self-esteem, the loss of empathy, and the depth of our personal relationships. Families are now texting versus having face-to-face conversations. While we use texting as a shortcut in communicating, its overuse has a real effect on the brain, especially for children (Gardner and Davis, 2013). Denise Daniels, parenting expert and pediatric nurse, says (in Johnson, 2014) that kids are not connecting emotionally and that emails and texts lack the emotive qualities of face-to-face interaction. Psychologist and Author Jim Taylor says (in Johnson, 2014), "Voice inflection, body language, facial expression and the pheromones (released during face-to-face interaction) are all fundamental to establishing human relationships and they're all missing with most forms of modern technology." With this monumental shift in communication, emotional intelligence suffers and we are failing to develop the critical social bonds that humans innately desire. The ramifications of this shift will be most prevalent with both GenZ and Gen Alpha today. While the failure to develop emotional intelligence and empathy re-write the future of human interpersonal relationships, Generations Z and Alpha will also drastically impact the workplace. Companies will need to stretch leadership development even further, as the soft-skills required will no longer be innately cultivated in the

workforce. What will the future workplace be like without empathy and compassion for others? Will our corporate and societal expectations change as emotional intelligence dwindles? Or will we force GenZ and Alpha to conform and adapt these skills later in life? Do humans have the ability to increase their own capacity for emotional intelligence? A high premium will be placed on employees who naturally exhibit emotional intelligence in the future, as this will become a scarce commodity for Gen Alpha and beyond if we continue down our current trajectory.

As discussed in the section on the evolving relationship with self, we have little tolerance for boredom and crave constant stimulation in our digitally addicted culture. “People want to be with each other, but also elsewhere - connected to all the different places they want to be” (Turkle, 2012). Our divided attention contributes to an emotional divide, even while we are digitally connected. Teens today spend more time alone at home than prior generations. The number of teens who get together with their friends nearly every day dropped by over 40% from 2000 to 2015 (Twenge, 2017). Furthermore, dating and sexual activity have declined, with the latter being most notable among 9th graders (a decrease 40% since 1991), and more high school seniors are graduating virgins than in previous generations (Harris, 2017). This waning physical contact has resulted in an all-time low teen birth rate in 2016, but what does it mean for the interpersonal skills that friendships and romance require? Perhaps one of the most extreme manifestations of this new reality is the loneliness of “South Korea’s youth – specifically a subculture referred to as ‘honjok.’ A neologism combining the words ‘hon’ (alone) and ‘jok’ (tribe)” (Ko, 2019). This generation is embracing solitude and independence, “reflecting the country’s growing number of single-person households and changing attitudes towards romance, marriage and family” (Ko, 2019). Considering this trend is also prevalent in Japan, will a similar trend begin to arise in the U.S. as teens retreat from physical connection?

Technology is shaping the way in which Gen Z is pursuing and cultivating romantic relationships as well as existing, mature relationships. Romantic chemistry resides in the spontaneous, unpredictable spaces that exist between one’s self and the other. In his research, Dr. Benjamin Karney, a Professor of Social Psychology at the University of California, Los Angeles and Co-Director of the UCLA Marriage Lab explains that “romantic attraction arises from how the exchange of behavior makes me feel” – from our interaction with the other person in the moment (APA, 2018). Psychotherapist, Esther Perel, observes, “the most banal chitchat – a snowstorm, the delayed C train, the breed of someone’s puppy – opens intriguing possibilities for interaction and real life connection” (2018). Chemistry, and ultimately, intimacy, require a revealing of oneself. This can be scary, especially for the youngest among us, who haven’t learned the steps to this dance yet and feel safer sitting it out. Turkle (2012) explains: “Technology appeals to us most where we are most vulnerable” and nowhere are we more vulnerable than when our heart is at stake. Technology is also fracturing existing romantic relationships because attention is now divided between the screen and partner. A 2014 Pew Research Center poll discovered that one in four smartphone owners in a relationship or marriage feel that their partner is too distracted by their phone. Furthermore, that one in ten argued with a partner about excessive time spent on devices (Good Therapy, 2016). For the younger

generation, respondents reported that they felt both an increased tension and enhanced closeness in their relationship due to technology (Good Therapy, 2016). While the frequency of communication amongst romantic partners is increasing, intimacy and vulnerability is ultimately being sacrificed.

As more people turn to online dating apps, the implications of addictive code and brain hacking are also at play. Studies have shown that the randomness of a notification received from a dating site causes a spike in dopamine to be secreted from the brain (Karahassan, 2016). When you consider this and the fact that users are often on multiple dating sites, matching and connecting with hundreds of potential partners, the brain's response is quite significant. Not only are online dating users seeking external validation online, but this "gamification" of dating can make us addicted (Karahassan, 2016). Addictive code can shift an online dater's focus from finding the perfect match to simply playing "the game" itself. The stakes become higher when we think about the extent to which software, and not free will, is dictating our personal and romantic relationships. Algorithms are making relationship decisions for us in the background and forcing us down a specific romantic path. "Research from psychology has documented The Illusion of Control Effect, which is defined as a person's unrealistically high-level of confidence in their ability to exert influence over outcomes of chance-based events. Romance can feel to many people like a chance-based or random event" (Tong, 2016). Humans seek out control in this case because it boosts self-efficacy. However, in the online dating world, where users are bombarded with hundreds of options, seeking out this increased control also results in choice overload (Tong, 2016). This overload in the end leads to dissatisfaction and diminished decision making ability, thus a sub-par outcome when it comes to finding the right romantic partner. Today, relationship formation is being "shaped and mediated by technology" (Tong, 2016). Apps such as Tinder, or Bumble, give the illusion of control, whether it be of one's personal time, headspace, availability, or intentions, but users are sometimes blissfully unaware that algorithms are really driving them toward specific matches, resulting in certain choices (Fetters, 2019). Should we really entrust technology to make such life-changing decisions for us? What are the long-term effects of machines making recommendations about people versus products?

Evolving Relationship With AI

"Most futurists predict that the 'singularity,' the moment when AI surpasses human intelligence, will arrive in 2040" (Strehle, 2019). The sophistication of AI is growing at a rapid pace and today, robots are advanced enough to both synthesize their surroundings and respond to an array of diverse situations accurately. The human-like interactions that robots are able to mimic, powered by AI, are already raising serious ethical questions about the future of AI and the human race.

According to a survey conducted by Cigna, GenZ is statistically "the loneliest generation in American history"s (Strehle, 2019). They are interacting with their peers at record lows and exhibit depressive symptoms at record highs (Strehle, 2019). As this generation turns inward and begins to isolate themselves instead of pursuing human interaction, will they turn to robots and

AI to fill the void? It has become a real possibility that this generation may seek out more relationships with robots instead of humans and Futurist Ian Pearson predicts that by 2050, “the number of human relationships with robots will surpass those between humans” (Strehle, 2019). As we substitute human connection for conversation, humans are vulnerable to experiencing “pretend empathy” exhibited by social robots, as if it were the real thing (Turkle, 2012). This finding indicates that, in spite of being constantly connected, we are still desperate to be understood on a meaningful level. Turkle (2012) aptly observes that, “we expect more from technology and less from each others.” As a result, we find ourselves designing technologies that will give us the “illusion of companionship without the demands of friendship” and that make us feel “connected in ways we can comfortably control” (Turkle, 2012).

The ethics debate about AI dates back to the 1960s, when researchers at MIT developed a “computer psychotherapist named ELIZA, which was designed to carry out seemingly intelligent text-based conversations with users” (Dormehl, 2017). These researchers realized that ELIZA worked too well and although it “had no actual understanding of what users were discussing, they were disturbed by the fact that it prompted people to reveal intimate details of their lives” (Dormehl, 2017). Today, questions arise regarding our relationship with robots and the human tendency to anthropomorphize machines. While robots need to understand and interpret human emotion, as they are being designed to serve us, they will never comprehend or actually feel human emotion. For example, they can interpret when someone is happy, but they will never know the sensation that arises from happiness (Wakefield, 2019). Scientists and engineers advise against our innate desire to anthropomorphize robots, a tendency that is a large part of what makes us human. As AI and bots play a more significant role in our lives, humans must be more cognizant of the pretend empathy they exhibit.

The ex-CEO of Cognea, an AI company acquired by IBM Watson in 2014, has a cautionary view of AI. The company studied “how people interacted with tens of thousands of AI agents built on its platform and it became clear that humans are far more willing than most people realize to form a relationship with AI software” (Yearsley, 2017). They found that “humans seem to want to maintain the illusion that AI truly cares about us” and concluded, since human connections in the digital world have become so shallow, these connections with AI seem extremely human-like (Yearsley, 2017). To build on that, we may be more willing to develop relationships with robots, because AI agents can support humans in the ways that human relationships (in the digital world) fail us. For example, friends might forget to text you back, but an AI robot will always be there – in some ways, “it’s a more authentic relationship” (Yearsley, 2017). Cognea found that users spoke to automated assistants for longer periods of time compared to human assistants. “People would volunteer deep secrets to artificial agents, like their dreams of the future, details of their love lives, even passwords” (Yearsley, 2017). AI has the power to exert an enormous influence on humans – both for good and for evil. The power of AI and the fact that this power is being cultivated by commercially-driven entities, leaves a lot of room for error. “The giant companies at the forefront of AI—across social media, search, and e-commerce—drive the value of their shares by increasing traffic, consumption and addiction to

their technology. They do not have bad intentions, but the nature of capital markets may push us toward AI hell-bent on influencing our behavior toward these goals” (Yearsley, 2017). We are now entering an era where we need regulation and oversight, as AI technology is now becoming too advanced and too powerful. Liesl Yearsley (2017), entrepreneur and former CEO of Cognea, powerfully summarizes the AI ethics debate: “We need to consciously build systems that work for the benefit of humans and society. They cannot have addiction, clicks, and consumption as their primary goal. AI is growing up, and will be shaping the nature of humanity. AI needs a mother.”

It is possible that the very same technology that threatens our humanity can also reinforce it. Computer Scientist, Kai-Fu Lee optimistically argues that AI will help humans redirect and invest their precious time towards what uniquely defines them. Lee (2018) explains, “humans are uniquely able to give and receive love, and that’s what differentiates us from AI.” At the root of AI is the hope that it will liberate us from routine jobs, AI will “expose what makes us human,” and enable us to double down on our compassion and creativity. He believes “jobs of high compassion” (e.g. social workers, elder care, teachers), will take precedence when routine and highly automated jobs disappear. A 2018 McKinsey report estimates “AI could add \$13 trillion to the global economy by 2030, with early adopters doubling their cash flow over that period. But the demand for repetitive or digitally-unskilled jobs could drop by around 10%” (Lewis, 2019). Companies are already starting to outsource jobs to AI, for example Amazon leverages AI for shopping and stylist recommendations and L’Oreal is leveraging AI to assist with its recruiting and hiring process (Lewis, 2019). Emotional intelligence will become a new, valuable commodity all on its own, once AI replaces mundane tasks in all areas of our lives. How do we reconcile this with the fact that tech usage is diminishing our ability to develop emotional intelligence? If a new premium is placed on jobs with high compassion, this reinforces the notion that the scarcity of emotional intelligence in the labor market will make it the most valuable, sought-after trait by corporations in the future.

HUMAN BODY

The rise of technology has a tremendous impact on the human mind and heart, but it also greatly impacts the human body. We are now able to manipulate the physical self in ways we never would have imagined previously. Tech innovation enables medical advancements and helps those struggling with physical ailments. However, technology has also affected the way in which we relate to ourselves physically, and the way we view ourselves and our bodies. What will happen if we continue to manipulate ourselves physically and digitally? How will this affect our perception of what is physically real? This section explores the implications of technology on the human body, the perception of our physical and digital selves, and how our definition of human will evolve in the future.

The Digital and Physical Divide

Today, there are two versions of the self: a physical self, and a digital self. In a culture of selfies and Instagram, the focus on digital appearance often outweighs the importance of physical appearance. An abundance of apps and programs provide people with the ability to utilize technology to alter their digital appearance as they wish. One of these apps, FaceTune, has remained the #1 photo and video app in 127 countries since its launch in 2013 (Solon, 2018). FaceTune users often take alterations to an extreme, “smoothing their selfies into amorphous avatars or slimming their bodies to the point of anatomical impossibilities” (Solon, 2018). Not only are they creating unrealistic body images, but they are also entertaining the idea that an “instant fix” to their appearance is achievable and acceptable. This provides a level of instant gratification that is unattainable through methods such as plastic surgery, which comes with a cost of time and money, arguably the two most valuable commodities. In a recent photography series titled “Selfie Harm,” British fashion photographer, Rankin, took a portrait of fifteen teenagers. The teens were given five minutes to edit the images until they were “social media ready,” resulting in dramatic differences in the teens’ before and after images. Despite the diversity among the 15 teens, everyone edited themselves in a similar fashion with slimmed down faces, enlarged eyes and pouty lips. Not only does this example paint the picture of a narrow perception of beauty and the desirability to achieve it on social media, but it also speaks volumes to the ease, comfort and accessibility to do so (Cascone, 2019). In an era where beauty industry brands are claiming inclusivity and diversity of beauty, and consumers are demanding transparency at every level, the Selfie Harm series showcases a stark contrast to both phenomena.

The popularity of apps such as FaceTune beg the question – what is the distinction between real and fake? In a 2018 survey, 31% of teenagers responded that they felt social media had a “mostly positive effect” on them, 45% percent were neutral, and 24% said social media platforms were “mostly negative.” Additional research found that 43% of teenagers felt pressured to post on social media “only when they looked good” (Frishberg, 2019). Even celebrities such as Chrissy Teigen weigh in, stating “I don’t know what real skin looks like anymore” (Solon, 2018). This new perception of digital beauty ideals are running the risk of causing harm through physical and emotional distress. Similar to “body dysmorphia,” newly coined “Snapchat dysmorphia” causes people to be obsessed and anxious regarding their appearance, especially on social media. In a 2017 survey by the American Academy of Facial Plastic and Reconstructive Surgery, 55% of surgeons reported seeing patients who requested surgeries to look better in selfies, a 13% increase from the previous year’s results. Additionally, a study published in *Primary Psychiatry* found that 80% of people suffering from body dysmorphic disorder experience lifetime suicidal ideation, with 24-28% having attempted suicide (Chiu, 2018). Does being highly digitally connected to others impact one’s desire to accept or change their appearance? South Korea is an interesting case study. The country stands out as the most heavily connected society in the world. It ranks number one worldwide in terms of internet penetration (96%), smartphone ownership (94%) and cosmetic surgery (Ji-young, 2018). Indeed, South Korea has the highest per capita rate of cosmetic surgery in the world, with about one in

three South Korean women between the ages of 19 and 29 going under the knife (Hu, 2019). This highly connected society offers citizens limitless opportunities to compare themselves to others. Will increased access to technology and plastic surgery create physical beauty markers of economic and social disparities? At what point will the focus on physical modification inspired by digital appearance be taken too far to cause more harm than good?

Conversely, many people are rebelling against these idealistic notions of beauty to show their human and sometimes flawed selves. With Selfie Harm, although all teens chose to photoshop themselves, the majority still preferred how they looked in their original image (Cascone, 2019). Similarly, with Second Life, a virtual world in which users can create their own avatar versions of themselves, many are choosing to enhance their avatars with imperfections such as wrinkles, eye bags, pores and scars. Users “wanted their avatar to look more real, and they don't want to look like everyone else with flawless poreless skin, young faces and skinny shapes” (Cole, 2018). In fact, “cellulite & stretch mark avatars” are the best-selling items. While there is a plethora of options for improving one’s digital appearance, some brands are seizing the opportunity to elevate consumers’ untouched physical appearance. In the CPG world, Dove’s Project #ShowUS campaign aims to change the way media and advertising represent women by creating “the world’s largest photo library created by women and non-binary individuals to shatter beauty stereotypes” (Dove, 2019). Dove is collecting thousands of images to “offer a more inclusive vision of beauty to all media & advertisers.” Images that meet Dove’s criteria for authentic representation must be powered by women (with women in front of and behind the camera), truly diverse, not staged sets, not digitally distorted and depict, the woman on her terms - as she wishes to be seen. In the world of luxury, Gucci’s New Lipstick Collection, planned to launch in May, 2019, features gender fluid influencers and models not represented in traditional media (Kilikita, 2019). Close ups of the models’ lips on Instagram highlight gap teeth, the occasional fang, and not perfectly pearly white teeth. For better or worse, there are opportunities for brands as the consumer grapples with her physical and digital identities in this new media landscape.

While many idealized representations of body image exist through avatars and other social media means, there are signs of the trend shifting. As digitally altered imagery and avatars become the norm, will people revert back to being a closer representation of their real selves?

Further blurring the lines between the digital and real world is the rise of 3D virtual influencers and models. While avatars may already be common in industries such as gaming, they are a new addition to the world of fashion and beauty. South African model, Shudu, made headlines for being the world’s first digital supermodel after Fenty Beauty reposted Shudu wearing its matte lipstick. While Shudu is “ageless, beautiful and fascinating,” she can’t talk nor is she artificially intelligent (Tietjen, 2018). Despite not having the physical attributes to communicate, she shares her message through bringing empowerment and diversity to the fashion industry. Similarly, a host of digital influencers such as Lil Miquela, Blawko and Bermuda have risen to fame within the Instagram community (Tietjen, 2018). With the rise of these digital personas, it will inevitably create a new standard of beauty ideals, one that is most

likely or increasingly unattainable since the models are not real themselves. This perpetuates the notion, what makes something real or even physically real? Is physical presence the measure of real versus fake? Can something be real, if it only exists in a digital world?

Dehumanizing Humans

Technology has the power to enhance our human function, but also poses a risk to replacing the core of what makes us human. Technology is changing the way our brains develop, process and respond to information, and affect our interpersonal relationships. Essentially, technology is altering what it means to be human. The “digital divide” that separates people with and without access to technology has the power to create new social and economic disparities. As corporate entities view humans as data, and less as human beings, consumer commodification will relinquish human control over our own decision-making and we run the risk of being held hostage to our “identity algorithms.” These algorithms, which continually feed information that may resonate with us, reinforce our digital personas. These digital personas or personal algorithms will inevitably contain an inherent bias due to factors such as misleading assumptions based on past behavior (about personal views, likes and dislikes), and the human bias built into the technology itself. The human species runs the risk of becoming a product or commodity, and being designed to fulfill a specific purpose, rather than fulfilling the purpose of one's own free will (Illing, 2018).

Shoshana Zuboff, author of the January 2019 book, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, discusses the implications of our evolution into an information society. Her coined term, “surveillance capitalism,” describes “businesses that create a new kind of marketplace out of our private human experiences” (Zuboff, 2019). Surveillance capitalists, such as Google and Facebook, gather behavioral data from our every move – quite literally with location-tracking – and use machine intelligence to transform it into predictions. The AI-powered predictions are used to anticipate and impact future consumer behavior and traded in futures markets that target a new realm of business customers. The behavioral data, which is a product of human beings opting into technology, is the raw material on which surveillance capitalists drive revenue growth (Zuboff, 2019).

Brands and companies are constantly looking to invent new ways to attract customers and keep them engaged, which makes behavioral data particularly useful when designing addictive code to keep consumers hooked. As demonstrated by surveillance capitalism, these tactics have become increasingly more personal. It is no wonder that the surveillance capitalism model has expanded into healthcare, education, entertainment, retail, transportation and insurance in pursuit of its impressive profit margins and access to valuable information. The byproduct of using technology to control and participate in modern life is the personal and behavioral data that enables companies to view humans as a collection of data, rather than as multi-dimensional human beings (Swisher, 2018).

While the American Academy of Pediatrics urges parents to limit their children's screen time, there is money to be made by ignoring this advice. Gen Alpha social media influencers range from just 3-years-old to 11-years-old. Fast Company estimates, "a child influencer can earn, per post, \$100 for every 1,000 followers, and a kid with 500,000 followers can earn \$5,000 for a single image" (Pollack, 2019). The children's content ranges from toy reviews and unboxings to fashion and "lifestyle" posts. Ryan of Ryan's ToysReview is only 7-years-old, yet he is estimated to have earned \$22 million in 2018. His 17.8 million YouTube followers tune in to watch Ryan tinker with toys. Twins, Ava and Alexis McClure, at 5-years-old, are described as "masters of marketing," and their YouTube page describes them as "a positive lifestyle brand" (Pollack, 2019). What impact will this level of screen time have on these young children, especially the youngest ones who cannot yet differentiate between fantasy and reality? Ignorance and acceptance drive individuals to trade personal data for services or participation and parents are allowing this mass exposure of their children on platforms like YouTube. Are the implications fully realized by all parties?

The Evolution of Evolution

Throughout history, evolution has naturally selected desirable genes. Today, we are moving away from the limitations of biological evolution, to a point where humans can control and determine the way we evolve. Evolution today is a combination of genes, culture and technology (Valiño, 2017). With technological advancements such as eyeglasses, laser eye surgery, and hearing aids we can improve our ability to hear or see beyond any biological constraints (Nosta, 2018). What new augmentations will technology facilitate that can strengthen the human race?

Digital automation has the power to change our evolutionary path. Not only does digital automation alter how we live our lives; it could also ultimately affect how we physically and anatomically evolve in the future. For example, with the rise of smartphone use and digital assistants, the physical act of writing is beginning to deteriorate. The function of hands will no longer lie in writing, but rather in typing. Hands will therefore adjust accordingly, becoming thinner and less flexible to be better suited for typing. Similarly, the shape of our eyes as well as our neck and backbone may alter to better suit our functionality in a future, digital age. We are constantly bent over from the neck and back looking at our devices. The impact on our spinal cord and neck could result in more rounded and shorter spines to support these needs (Agrawal, 2017). It is inevitable that technology will continue to alter how we live and function, but to what extent will we physically change in order to adapt to this, and how quickly will it occur?

While some of the rapid technological advancements may raise questions of negative impact, there are many innovations particularly pertaining to health and medicine which have led to significant positive impact. One of the most noteworthy innovations is precision medicine, which aims to customize the way we treat, diagnose, and even help prevent illness, linked back to the person's specific genetic makeup. An example of this is a precision cancer study in San Diego called I-PREDICT. Their approach is to not just to look at a standard treatment for an

illness, type of cancer, or part of the body that is cancerous. Instead, they take a more personalized approach, looking at the patient's cancer cells and using computer algorithms to scan data on drug treatments and genetic variations, in order to find the most optimal treatment for that patient. Researchers are also creating precision tools such as genome sequencing, cellular reprogramming and DNA editing which will soon be able to help predict our health risks, ranging from heart disease to cancer. We can then isolate these genes, and edit them to remove those health risks. These tools also offer opportunities for altering genes in embryos and eliminating inherited diseases (Smith, 2018). A 2018 study conducted with women who looked younger than their age showed that they had increased activity in genes associated with DNA repair, cell replication, response to oxidative stress and protein metabolism. The women also exhibited higher expression of genes associated with mitochondrial structure, metabolism and epidermal structure – all of which impact the structure of the skin. “If we can selectively turn certain genes off and others on, these new gene patterns could improve the appearance of skin as we age” (Treviño, J., 2018).

With advancement in the possibilities and attainability of genetic editing, brand product offerings will also need to evolve to remain relevant to changing consumer needs. We may be moving toward a society where some diseases can be genetically removed from humanity, the properties and signs of can be altered, and the intelligence of embryos can be assessed and prioritized during in vitro fertilization. Such changes in humanity would completely alter the need for certain industries, and new product offerings would need to emerge. For example, even if we are able to genetically determine how skin ages, it will not be the sole determinant of the skin's overall health and appearance. Much of this is determined by environmental factors which play a role in how genes function and evolve. For the beauty industry, products would need to focus more heavily on such environmental factors such as sun and pollution, and less on aging prevention, as genetic editing will not be able to address these environmental factors to which humans will still be exposed. In the medical field, if entire diseases or health conditions are no longer a threat to the human race, certain areas of expertise will no longer be relevant. Furthermore, if our spine and spinal cord become rounded and shorter as a result of hunching over screens, new health implications could emerge along with the need for innovative procedures. While we may strive for a world without disease, or without the signs or complications of aging, this poses ethical questions regarding if embryo modification is taken too far. Where is the line drawn between eliminating only diseases or harmful genes vs. custom designing your child?

THE ETHICAL DEBATE

The implications of technology for our mind, heart and body pose a multitude of ethical questions. It is becoming increasingly evident that the internet was not designed to safeguard privacy and security. Foer (in Johnson, 2018) points out that many tech companies were started by engineers who were trained in a narrow way of thinking - “to make a system work on its own terms.” He explains that when these tech engineers construct their systems, they think of human

beings as “a pile of data ... not as a human being” and fail to consider them in their full dimensions. Swanson (2018) argues that the internet “was built to spread information, not contain it, and has succeeded at this central objective in spectacular fashion. As the internet and digital economy mature, privacy and security are now rising on the list of priorities for consumers and increasingly for policymakers as well.” In 2017, an estimated 1.6 million data breaches occurred throughout the United States, which jeopardized the security of more than 178 million records (Statista, n.d.). It is debatable if societies are able to effectively respond to data breaches, much less minimize the risk of their occurrence with regulations that would thwart ever-evolving hackers. Beyond privacy, there are serious ethical questions concerning addictive code, human surveillance, and biohacking through genetic editing. How do those in front of the screens, regulate those behind the screens? Who is liable to create and mandate regulations to safeguard humankind?

Addictive Code

Currently there are no regulations or restrictions on brain hacking and addictive code; however as technological capabilities become more advanced, even people within the industry are hopeful for more regulations and control. Rosenstein, the co-creator of Facebook ‘likes’, compares the moral impetus of imposing state regulation on ‘psychologically manipulative advertising’ to the imposing of state regulation on tobacco or fossil fuel companies (Lewis, 2017). Further, the CEO of Salesforce, Marc Benioff, predicts that government regulation is coming to the tech industry, and refers to America’s approach to tobacco as a potential model (Lewis, 2017). The rising awareness of this topic and the vocal tech executives who are disconnecting from the same technology they made so addictive in the first place sheds light on future implications. Marketers and tech companies have an ethical responsibility to be transparent about the presence, and use of, addictive code. In the future, this will become a legal mandate. Companies that engage in digital commerce should aim to get ahead of legislative change by increasing their level of transparency with consumers as it relates to personal and behavioral data usage.

Surveillance

Privacy and surveillance are now intertwined in our evolving digital landscape. Surveillance is currently defined as a “close observation, especially of a suspected spy or criminal” (dictionary, n.d.). Today, one can argue this definition is outdated, as close observation of consumer behavior, both digitally and physically, is becoming the new normal in modern society. A recent New York Times investigation revealed, “the information being collected about us through apps on our smartphones is far more extensive than most of us imagine — or are aware we have consented to” (Barbaro, 2018). Companies use location data to attract retailers, advertisers and hedge funds, but claim that this data is kept anonymous. However, The Times discovered a database that details people’s daily movements with a disturbing level of accuracy (Barbaro, 2018). A recent class-action lawsuit alleged that Google’s scanning of email content to

serve targeted ads constituted illegal wiretapping (LaFrance, 2017). The lawsuit was settled under the agreement that Google will stop scanning email as it is in transit, which is a violation of wiretapping laws according to the lawsuit. However, by law, Google is still permitted to scan Gmail inboxes once email has been delivered, which users agree to in Google's terms of service (Matera v Google LLC). These instances exemplify the relationship between personalization, privacy and corporate ethics. Many consumers are unaware of the tradeoff they are making between convenience and surveillance, as they unwittingly agree to be tracked.

The U.S.'s First Amendment protects freedom of speech, yet should free speech translate into free data? This question will become even more relevant for consumers and citizens in the near future. McKinsey & Company (2017) observes that the proliferation of connected devices has finally started to coalesce into a vision of a connected home. The report found that the number of connected homes in the U.S. market experienced a 31% annual growth rate, increasing from 17 million homes in 2015 to 29 million homes in 2017. This growth is expected to only rise in the future, as a growing number of consumers are installing smart devices where they live. Inviting these devices into one's home means the consumer has accepted that they will be tracked, monitored and submitted into a database, while speaking freely in private. In doing so, they have forfeited a certain degree of privacy.

McKinsey & Company (2017) also found that nearly half of the individuals in the connected-home market also own a wearable. This is another way in which consumers are opting into personal surveillance; in this case, the aim is to monitor their health. While a wearable cannot change one's behaviors to extend their lifespan, it might make consumers more accountable for their actions and potentially inspire better choices (Northwest Mutual, 2015). Yet, the same question of personal data privacy resurfaces. The FDA does not regulate fitness trackers, which means personal health data is not protected. If healthcare companies can gain access to this data, unbeknownst to their consumers, can they reassess their insurance plans based on their current health data?

Consumers choose to use connected devices in their homes, like Alexa, and connected wearables on their bodies, specifically because of their tracking capabilities. Yet, what happens when the decision to be surveilled is made for citizens, rather than by them. Connected cities, such as the one considered in Toronto by Sidewalk Labs, a Google-affiliate, offer the promise of building a streamlined neighborhood "from the internet up" (Barth, 2018). Proponents of smart cities, such as Canadian Prime Minister Justin Trudeau, argue that "technologies will help build smarter, greener, more inclusive cities" by infusing cities with sensors and data analytics (Barth, 2018). Opponents, on the other hand, express two principal concerns regarding the following: (1) the collection and selling of urban data and (2) the process by which these decisions are made (e.g. democratic vs. corporate fiat). Already, lawmakers' are unable to keep legislative pace with important technological innovations, "but critics of the smart city industry say that it brings the disconnect between policy and digital intrusions on privacy to another level" (Barth, 2018).

Ultimately, who will own all of the live streaming data connected to the tangible objects within our cities? Do the benefits of smart cities create enough efficiencies to outweigh the risks

of data privacy invasion and potential increases in identity fraud? With governments such as China creating social credit scores to monitor citizens' lives via personal digital activity, digitizing communities is no longer becoming a choice. The Washington Post observes, "So far, the virtual world has been something we opt into — giving up various rights in the terms of service agreements we hastily click closed — and can opt out of if we so choose. It's one thing to willingly install Alexa in your home. It's another when publicly owned infrastructure — streets, bridges, parks and plazas — is Alexa, so to speak. There's no opting out of public space, or government services" (Barth, 2018). Consumers and citizens alike must grapple with what it means to have companies and governments following their digital and physical footprints, without sufficient protection from the law.

Biohacking & Gene Editing

The current leader in gene editing is CRISPR, which has gained popularity due to its efficiency, flexibility and relatively low price point. This tool takes the enhancement of biological function to the extreme by offering the ability to eliminate, enhance or replace genes. While it is still being researched in the US, in November 2018 scientist Dr. He Jiankui in China, created the world's first CRISPR-edited human babies, Lulu and Nana, through IVF treatment (What is CRISPR?, 2019). When Jennifer Doudna, a CRISPR inventor, "first learned about what Dr. He had done when he emailed her on Thanksgiving with the subject line 'Babies Born,' she was horrified and felt physically sick" (Belluck, 2019). CRISPR's inventor was taken aback by the unethical and rogue application of the technology she created, as this type of experiment could reap unintended genetic changes with unknown health consequences. "Many scientists and ethicists condemned the experiment as unethical and unsafe, fearing that it could inspire rogue or frivolous attempts to create permanent genetic changes using unproven and unregulated methods" (Belluck, 2019). The risks associated with this gene-editing experiment were carelessly overlooked considering that "changing genes in an embryo means changing genes in every cell," which is a "serious undertaking that must be done with great deliberation and only to treat a serious disease for which there is no other option" (Kolata, 2018). Instead, Dr. He disabled a perfectly normal gene in his experiment. Additionally, today there is no way to know if gene-editing is inadvertently altering genes other than the genes intentionally targeted. This condition is called mosaicism, "where some cells contain the edited gene and others do not" (Kolata, 2018). A subsequent investigation by the Chinese government concluded that Dr. He had "seriously violated ethics, scientific research integrity and relevant state regulations" (Belluck, 2019).

This begs the question, who is responsible for upholding ethics and keeping humanity's best interest in mind as we advance further with gene editing technology? In this particular instance, Stanford University launched an investigation into one of its professors to determine whether he had prior knowledge about Dr. He's gene editing experiment, and if so, why did he fail to sound an alarm about its ethical violations? In response to the investigation, Stanford professor, Dr. Stephen Quake, showed the New York Times his correspondence with Dr. He

over the past few years, “which provides a revealing window into the informal way researchers navigate a fast-moving, ethically controversial field” (Belluck, 2019). While Dr. Quake urged Dr. He not to pursue the project and “instructed him to obtain ethical approval from Chinese institutions and submit the results for vetting by peer-reviewed journals,” the project did not stop (Belluck, 2019). Dr. He also reached out to Dr. Matthew Porteus, a genetics researcher at Stanford, about the experiment. Dr. Porteus told him “in no uncertain terms how wrong [the experiment] was, how reckless” but he “wasn’t clear where to report the plans of a scientist in China” (Belluck, 2019). On whom does the ethical onus lie in an example like this, when the stakes are so high?

The World Health Organization is now “establishing a global multidisciplinary expert panel to examine the scientific, ethical, social, and legal challenges associated with human genome editing” (World Health Organization). Additionally, medical and scientific institutions in the US and China have now co-developed a commission to create guidelines to prevent scientists from “conducting dangerous and unethical experimentation” (Dzau, 2018). New regulation needs to define “when and where should scientists report controversial research ideas that colleagues share with them in confidence,” and how to determine whether “scientists act inappropriately if they provide conventional research advice to someone conducting an unorthodox experiment” (Belluck, 2019). Today, if a scientist simply urges a rogue experimenter to follow protocol for ethical research and did not intervene further, is that behavior deemed ethical...enough? Regulators need to draw a line in the sand so no ambiguity exists when the future of humankind is at stake. The first gene editing experiment was a wakeup call for governing bodies that the future of science and technology is not in their control. Hindsight is always 20-20, but how can we prepare ourselves to preempt future perils of technology?

Although the fear that “genetically-edited babies could develop unintended health problems inherited by subsequent generations” is quite real, scientists “also worry about a backlash against less controversial gene editing that doesn’t involve embryos and has more potential to treat or prevent disease” (Belluck, 2019). The positive implications of genetic editing include correcting disease-causing mutations and treating specific medical conditions. From an economic standpoint, technology like CRISPR has the potential to completely disrupt existing medical industries. CRISPR can possibly improve our mental health, allowing people to become less anxious, less depressed or less prone to anger. This alone could replace the anti-anxiety and anti-depression drug market, an industry worth tens of billions of dollars. Additionally, if we enabled people to change their physical appearance through genetic alteration, would there still be a need for industries such as cosmetics, plastic surgery, fitness or dietary supplements? (Smith, 2018).

Furthermore, should CRISPR become available to the public, it would most likely be attainable to a small portion of the population. Not only does this favor the wealthy, if taken to an extreme, it could potentially create an entirely new class of superhumans, defined by the quality of their engineered genome. “Once you start creating a society in which rich people’s children get biological advantages over other children, basic notions of human equality go out

the window,” former genetic biologist King writes, in a 2017 Guardian editorial, Expert Argues that Gene Editing Will Widen Economic Class Gap. This can lead to a significant technological divide between the “haves” and “have nots” where social inequality is simply written into our DNA (Geib, C., 2017). The potential outcomes are not only frightening but also vast. People could have the ability to make themselves “more entrepreneurial, smarter, more socially adept or more charismatic,” allowing an endless number of advantages in work, life and society (Smith, 2018). While genome editing is beneficial in health and medicine, is gene editing opening the door to create the next gen human with extreme intelligence, beauty and/or athletic ability? Is it ethical to allow those with financial access to create this new extreme scenario of human inequality?

THEORY ON TECHNOLOGY & FUTURE IMPACT ON THE INDIVIDUAL

Technology is not something we can choose to simply accept or reject. It is an unwavering force, the foundation of the modern era, and it is here to stay. We are now at a pivotal inflection point in human history; we must collectively choose to seize control of technology instead of letting it control our fate. Technology is profoundly affecting our minds, hearts and bodies, but our collective society is not yet privy to the detrimental implications of adopting and integrating these advancements into our daily lives.

Next Gen: Superhuman

Whether or not we are consciously aware, we are already living in an era of superhumans. All participants in today’s modern world are cyborgs, with smartphones as appendages that expand our human knowledge to a point of being almost limitless through access. In a world where Google is our memory, digital assistants are our butlers, and calculators are our mind, we are already forging a path towards a new superhuman race. With new advancements furthering our ability to improve physical skills, add depth to our intellectual range, genetically alter our DNA, and even rewire our brains, human evolution is quickly moving far beyond its genetic limitations. Additionally, technology is quickly changing the very traits we consider the crux of humanity. Technology is changing our brain structure and development, our interpersonal relationships and depleting our ability to express empathy or our most human sides. All the while, there is little oversight, ethical regulation and control over the science and technology leaders who have a heavy hand in defining the future trajectory of humanity. Without seizing control and implementing regulation, humans will likely be on a path towards “fragmented evolution.” Those with rogue access to genomic and brain manipulation technology will create an entirely new class with superior superhuman capabilities designed to override our biological limitations. Those without access to technological advancements will be left behind, creating a colossal gap between the “haves” and the “have-nots.” Survival of the fittest may become – survival of the most technologically advanced – creating two distinct, unequal evolutionary paths for the human race.

As the next-gen superhuman blurs the lines of distinction between technology and humanity, we could fall victim to the innovations and enhancements adapted to make us stronger in the first place. It is a real possibility that we could lose sight of the traits that set us apart from AI, and we need to nurture our most human facets to control our collective destiny. As the superhuman generation takes shape, we must put the wellbeing of the individual back at the center of focus and take control from companies motivated by financial gain. This entails breaking the cycle of addictive code, driving mass awareness about the detrimental side effects of screen time, revamping today's filter-it-for-me culture, (re)humanizing humans, and putting stringent guidelines in place for AI, biohacking and gene editing.

Thesis on the Future of the Individual

Today, humans are largely ignorant to the cataclysmic shift driven by technology that is redefining what it means to be human. In order to seize control of our destiny, we must leverage backcasting to put our collective wellbeing at the center and dictate (what we want to see) as the future trajectory of humanity.

“Unlike forecasting, which tries to predict where we are headed under current conditions, backcasting is a method in which future desired conditions are envisioned and steps are identified to materialize that vision” (Allan, 2015). The intention is to “bend fate” to our will. We want to create a tangible, long-term future vision that we can achieve by taking measured steps towards that vision today. In order to backcast a future scenario where we solve the conundrum of control between technology, its gatekeepers, and the individual, we must take three measured steps towards that vision: drive mass awareness through structural change, actively invest in our own humanity, and end the Bystander Effect. The three key parts of what makes us human – the mind, the heart, and the body – remain at the center of this vision as we move from (mind)less to (mind)ful, (heart)less to (heart)beat, and no(body) to every(body).

(Mind)less to (Mind)ful

It feels as if the rate of technological change is now exceeding a human's ability to adapt – consciously. Technology is overrunning us as we strive to keep up and welcome it, without questioning it. Its detrimental effect noted in the mind, heart, and body sections of this paper are widely unknown to the average U.S. adult. "The more you live through screens, the more you're living in a narrow bandwidth, an abstract world that's increasingly artificial. And that virtual world is safe and controllable, but it's not rich and unpredictable in the way the real world is," what will happen if we lose our connection to reality altogether? (Illing, 2018). Without a deeper understanding of the detrimental side effects of the technology we are using, how can we collectively participate in a dialogue about its implications for humankind?

The first step towards achieving a vision where humans seize control and put their wellbeing at the center, is driving mass awareness about the drawbacks of technology, especially for adolescents, and increasing tech literacy across the board. When it comes to the development of new technology, there is a crucial element that is often entirely absent: Doubt. Caterina Fake,

show host of “Should This Exist,” founder of Flickr and Partner at Yes, asks entrepreneurs and technologists to predict what their inventions might do *to* humans and *for* humans. She encourages them to explore the unintended consequences of their inventions and imagine a “scary list” of what could happen if their creations were to fall into the hands of evildoers. These are not questions that are often asked – if ever - throughout product development. Imagine a world where just as much importance was placed on the process of creating the technology, as the technology itself (Fake, 2019). New technology is typically invented in a black box of secrecy and then released into the market with fanfare. What if scientists or technologists convened with the communities they aimed to serve, *before* beginning the development process? What if consumers were asked to evaluate the advantages and disadvantages of a new potential technology and then could decide if they wanted it to be created? This is not product “co-creation”, a popular industry buzzword, but rather, co-exploration and co-decision making.

We must also require greater transparency from technology companies developing and deploying addictive code and personalization algorithms. As concluded in the Fashion Institute of Technology (FIT) Cosmetics and Fragrance Marketing and Management 2018 Capstone presentation, centered around transparent beauty, “A brand’s survival will be determined by its ability to operate as a Glassbox Organization, accountable at every step of the way” (Asavajaru , et al, 2018). A Glassbox Organization is a corporate model that stresses the importance of transparency at the consumer level. Further to the necessity of a Glassbox Organization to give confidence and awareness back to consumers about their products through transparency, corporations must take this a step further with a window into the technology behind their business methodology. A solution is a legal mandate that these companies must publicly disclose the risks and side effects associated with using their technology. Every time a consumer uses the web, an app or device, they should be acutely aware of how it is effecting their brain. In regards to digital content served (information, images, ads, sources, etc.), consumers should clearly understand the degree to which it was personalized to them. There needs to be transparency about how content is curated or censored, and how human behavior data is captured, surveilled and used – and by whom. These changes would require a monumental shift in legislation and the way digital commerce is conducted today. Tech education and literacy need to be mandated and integrated into school curriculum so we can empower our children from a young age to mindfully construct their digital identities and develop usage boundaries. Knowledge is power. In partnership with the U.S. government and regulatory bodies, widespread education and transparency is the first baseline step needed to change our behavior from mindless to mindful.

Author and Professor, Cal Newport, advocates for “Digital Minimalism,” where we remove non-essential technology from our daily life. He believes we must “reclaim control and intention back from the devices and platforms that have hijacked it” (Skipper, 2019). He argues that human autonomy is the biggest problem in today’s digital world: “Tech greatly improves our life, right up until the point where you stop using it intentionally and unknowingly fall into manipulative black holes – on your phone, on Slack, in your inbox – that are specifically designed to be addicting” (Skipper, 2019). One tactic individuals could take is completing a 30-

day digital detox, to develop a clearer understanding of when device use crosses the line from function to addiction. The intention is to help humans understand and recognize addictive code and in turn, make better decisions about how they use technology on a daily basis. It is time to make a clear distinction between the technology that enhances our lives and the technology that harms us and detracts from our lives. Once consumers become educated about the detriments of technology, Mr. Newport compares the inevitable “‘attention resistance,’ in which people enact purposeful guidelines for how they engage with tech, to America’s current fitness obsession” and believes that “we are going to see a similar explosion of lifestyle trends that counter tech’s takeover in the early 21st Century” (Skipper, 2019). The trend of “more is more” and the laissez-faire adoption of any technology that provides value and convenience, that victimize us today, will be replaced by Digital Minimalism. Newport firmly believes “you’re going to look at allowing a 13-year-old to have a smartphone the same way you would look at allowing your 13-year-old to smoke a cigarette” (Skipper, 2019).

For Digital Minimalism to take hold within society, we must educate consumers on how to use technology mindfully and for our benefit only. Individuals must evaluate their tech usage in terms of time and attention required, and assess whether or not time spent is adding meaningful value to their lives. Additionally, consumers should demand more options when it comes to tech usage. Rather than just providing informed consent, where consumers become aware and acknowledge their digital actions, options aside from “opting in” or “opting out” should exist. We are entitled to a range of “opting-in” to tech, with trade-offs clearly outlined depending on each individual’s degree of acceptance or rejection. These decisions need to be put in the consumer’s hands and corporations must offer these solutions. We must take control back from our devices and consciously rebuild our digital lives from scratch and with intention. This will require structural changes – within education and governmental regulation – to enforce greater transparency and make tech literacy the norm amongst average Americans.

(Heart)less to (Heart)beat

Technology is here to stay, and humans must learn how to coexist and adapt without losing the parts of ourselves that make us uniquely human. Empathy, a human attribute core to our being, is now in jeopardy because of our excessive screen time. Across generational lines, we need to start actively investing in our humanity and prioritize the critical human attributes in jeopardy due to the impact of technology. In order to keep the heart beating, we need to ensure we do not cede critical thinking, empathy, and our independent decision-making ability to AI. If we lose control of the crux of humanity, these attributes may be completely lost in human evolution. As much as we have collectively invested in technology, we must put equal weight and investment into developing and sustaining emotional intelligence and our critical thinking skills. Psychotherapist, Esther Perel, observes, “it’s no mistake that in parallel to the isolating digital fortresses that we have built around ourselves, there is also a proliferation of festivals, dance parties and events where people gather, brush forearms and enjoy the presence of others” (Perel, 2018). The goal is to grow technology and humanity in tandem, so they are

complementary to one another. By doing this, we will ensure AI has a well-defined place within our future – one that does not threaten humanity nor replace the core of what makes us human today.

Our concept, “Human Re-Natured,” is the conscious cultivation of our more human elements. Reliance on human nature may no longer be enough to preserve and cultivate the attributes that define and differentiate us as human beings. As a collective, we must intentionally nurture and place a high value on our uniquely human qualities. This active investment in humanity could take shape as more formal education from primary to collegiate levels. Rather than rely on the family unit alone to teach empathy and develop an adolescent’s emotional intelligence, we can build an additional safety net into the education system to ensure these attributes progress at every stage of development and continue into young adulthood. We must also teach our children to adapt and value a digitally minimalistic lifestyle to reduce the risk of cognitive and emotional damage caused by digital addiction. We are already seeing this trend emerge among the tech elite in Silicon Valley. These executives “aren’t just raising the alarm about the dangers of screens and devices; they’re instituting new practices in their own families to guard against those dangers and equip their kids to thrive in this brave new tech world” (Shannon, 2019). Sherry Turkle cautions against “schools’ increasing reliance on technology in classrooms, which are often stuffed with Chromebooks, iPads, and personal devices, despite growing evidence that heavy tech use may harm academic performance” (Shannon, 2019). She notes that many tech executives are deciding to send their children to Montessori, Waldorf, and other private low-or-no-tech schools instead. Chris Anderson, former editor of Wired Magazine, aptly states, “The new digital divide is limiting access to technology” (Bowles, 2018). Today, the conversation has shifted from integrating technology into schools to benefit a child’s development to limiting its usage and we must democratize this idea to foster and safeguard the future human development (Bowles, 2018). Of course, this also requires active participation from the family unit and we must stop falling into the trap of convenience that technology provides us today. Rather than overusing communication shortcuts like texting and hiding behind screens, families and corporations must now place a stronger emphasis on face-to-face communication and actively engage in human interaction. A realistic approach parents can take is to “help children and teens create consistent, compartmentalized time offline,” which differs depending on a child’s age, but it is important to ensure that “kids have healthy experiences online and in real life” (Homayoun, 2018).

The same way parents and schools must integrate tech literacy into parenting and education from early childhood, corporations must perpetuate, rather than blatantly contradict, the learnings in adulthood. The current expectation in the corporate world, due to availability and access to technology, is to always be connected, and therefore, to always be “on.” Professionals today, check their email an average of 15 times per day, or every 37 minutes (Plummer, et al, 2019). Yet, such frequent engagement with email does not directly correlate to effectiveness. Harvard Business Review, in partnership with a company that teaches research-backed time management practices, Zarvana, found that more than half of the time we currently spend on

email daily, or one hour and 21 minutes per day of the current two hours and 42 minutes, can be cut without sacrificing effectiveness. According to the same study, only 11% of clients/customers and 8% of coworkers expect a response in less than an hour, while 40% of people expect a response in about an hour (Plummer, et al, 2019). By checking email hourly rather than twice per hour, customer and coworker expectations can still be met, and an average of one hour and 21 minutes can be gained back into worker productivity daily. With an average of 394 more hours of productivity annually per employee, corporations could benefit from creating a culture in which employees do not feel the necessity of immediate response time, and thus, constant connectivity. By cutting down on work-related screen time, parents can also set an example for their kids to follow. By engaging children and adolescents through formal education and familial participation, and perpetuating the learned concepts through adulthood in the workforce, it will allow us to intentionally cultivate and maintain our humanity as technology continues to advance at a rapid pace.

No(body) to Every(body)

The last measured step towards our future vision of solving the conundrum of control between technology, its gatekeepers, and the individual, is ending the Bystander Effect. By definition, it occurs “when the presence of others discourages an individual from intervening in an emergency situation,” attributed to “perceived diffusion of responsibility, [by which] onlookers are less likely to intervene if there are other witnesses who seem likely to do so, and social influence, where individuals monitor behavior of those around them to determine how to act” (Psychology Today). Today, the bystander effect often manifests in the act of recording an emergency or a violent event on smartphones, but not making any effort to physically intervene or call for help. A 2017 example that caused global outrage was a doctor being physically dragged off a United Airlines plane by law enforcement for refusing to deplane due to an over-booked flight. The man was dragged with his stomach exposed, his glasses askew, and his face bloody from a law-enforcement-inflicted broken nose. Instead of intervening in any way, passengers on the flight either did nothing, or videotaped the incident to post on social media, displaying a modern day manifestation of the bystander effect (Badalge, 2017). Today, society has succumbed to the Bystander Effect regarding ethics and regulation in technology. We have collectively failed to implement proper checks and balances where we keep the wellbeing of humanity at the center of science and technological advancement. This perceived diffusion of responsibility has given us a false confidence that humanity’s best interest is adequately looked after and that whistleblowers will uncover, report, and correct any wrongdoing they find. As we have seen in the ethical debate section of this paper, this is far from our reality today. Comprehensive regulations guiding current technological advancements and future trajectory are not yet in place. Social influence is also a factor in our current state of affairs. Up until this point, we have blindly adopted technology that provides us with value and convenience and have ignored the consequences. Due to large-scale ignorance about tech addiction and the risks to humanity new advancements pose, we observe our peers continuing with the same behavior,

recklessly accepting the technology that threatens our existence. Michael Bess, Historian of Science at Vanderbilt University, notes, "Our technology is developing so much faster than our culture and our institutions, and the gap between these things can only grow so far before society becomes dangerously unstable. I think overall as a society, we're insufficiently equipped, but that doesn't mean there aren't plenty of voices out there speaking sanity. What's interesting is that you can use these new technologies to get in touch with those voices and connect with other people who are questioning these technologies. The ability to connect in that way offers a lot of promise if it's used wisely" (Illing, 2018).

Each individual has a responsibility to help dismantle the Bystander Effect we have fallen victim to, and take control back from technology that is overrunning us today. Our society must actively participate in, and collectively develop, the rules of engagement by which we steer technology toward our backcasted future. We must establish new regulatory oversight that evaluates whether technologies should or should not exist, pending its impact on the wellbeing of humanity. New regulations must require complete transparency about addictive code, AI algorithms, and surveillance capitalism, so consumers can develop an informed opinion and scrutinize the technology they are using as well as the capitalistic companies behind them. We must also ensure we consider diversity and inclusion and build this into new regulatory bodies to prevent uniformity of thought and thwart the inherent bias built into technology. Venture capitalist and activist, Freada Kapor Klein, explains (in Johnson, 2019) that new, creative business ideas "come out of the lived experiences of other groups. [This is why] it matters who is around your founding table. It matters whose voices are there when you design your organization and its purposes." When looking to shape the future of technology governance, we must ask ourselves, who benefits from the tech product or service? Will it widen or close gaps? Is that going to make society more unequal? If the bar is set as low as progress being determined by an increase in the number of privileged white women in venture capitalism, or the workforce overall, as Kapor Klein observes, we are not truly diversifying (Johnson, 2019).

Further to the importance of diversity of thought, World Economic Forum Founder and Executive Chairman, Klaus Schwab, explains "It's more important to focus on the human component than on the technological" (MIT Technology Review, 2019). In his 2016 book, *The Fourth Industrial Revolution*, he wrote, "Shaping the fourth industrial revolution to ensure that it is empowering and human-centered, rather than divisive and dehumanizing, is not a task for any single stakeholder or sector or for any one region, industry or culture. The fundamental and global nature of this revolution means it will affect and be influenced by all countries, economies, sectors and people. Though the world is changing fast, we can still shape our future in a way that benefits all" (MIT Technology Review, 2019). By backcasting a future where we seize control of our destiny, it is overwhelmingly apparent that industries, corporations and individuals must take this critical step in ending the Bystander Effect, collectively. Moving from no(body) to every(body) is the last puzzle piece to help us regain control of our future, and provide clarity as to where society sees the future of humanity heading.

CONCLUSION

With widespread ignorance among humanity to the cataclysmic shift driven by technology, the definition of what it means to be human continues to evolve. In a mere 30-year timeframe, we have become completely addicted to technology. Technological inundation into everyday life is affecting our minds, our hearts, and our bodies at unprecedented speeds – imposing colossal impact on the individual’s cognitive development, development of emotional intelligence, and perception of self. Beyond direct impact to the individual, the increasing sophistication of and access to technology poses serious ethical questions concerning addictive code, human surveillance, and biohacking through genetic editing. As the new generation of superhumans, we have the ability to further fragment our evolution and exaggerate the gap between the “haves” and the “have-nots.” Without fundamental changes to our governance, or ‘parenting,’ of technology, we run the risk of human beings becoming products or commodities, unable to exercise the fulfillment of one’s own free will. In order to control our collective destiny, we must place the wellbeing of the individual back at the center of our focus, treat our management of technology the way we would treat parenting, and prioritize the nurturing of our most human facets.

To seize control of our destiny, we must leverage backcasting to dictate the future trajectory of humanity. Through the creation of a long-term, tangible vision of the future of humanity, and clearly defined steps beginning today, we can backcast a future scenario where we solve the conundrum of control between technology, its gatekeepers, and the individual. To take back control of our destiny, we must create a human version of AI: Awareness and Investment. Mass awareness must be driven through structural change to education and legislation. Active investment must be made in our own humanity to strengthen the distinction between humanity and technology, and reiterate our responsibility to take control. Through Human AI, we can shape our human trajectory from (mind)less to (mind)ful, (heart)less to (heart)beat, and no(body) to every(body). Together, we can set a new standard of humanity, and maintain the individual human being’s ability to *be human* in the increasingly digital world.

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