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**Mindfulness as a Personal Strategy to Combat the Negative Effects of the Attention  
Economy**

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**Abstract**

This paper argues the importance of a personal mindfulness practice as an antidote to the concerning effects of the attention economy. Modern technology is becoming more powerful every day and is giving individuals access to an unprecedented amount of information at the touch of a button. Many technology companies are profiting from gaining and selling the attention of their customers and are contributing to the attention economy. These very technologies have been shown to hijack the attention of consumers and keep them in an addictive feedback loop. Early research suggests mindfulness practices may be an effective strategy for strengthening attention networks and physically changing areas of the brain responsible for attention. This paper utilized prior research to generalize the viability of a personal mindfulness practice for taking control of an individual's attention and to subsequently negate the negative effects of the attention economy. Further research on specific mindfulness practices and their outcome on certain aspects of the attention economy are warranted.

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## **Mindfulness as a Personal Strategy to Combat the Negative Effects of the Attention Economy**

In 2021, we find ourselves in an economy which is capitalizing on and monetizing our attention. Technology companies engineer websites, products, and devices that hijack our ability to pay attention so that they can keep us in an addictive habit loop, continually returning to their product. The “attention economy” is defined somewhat vaguely within the literature. Jay Vidyarthi (2016), a researcher and teacher focused on the intersection of mindfulness and technology defines this economy as “a system in which human attention is the commodity being bought and sold” (para. 2). While the attention economy is not a new phenomenon, the modern impact of the attention economy is unprecedented. At no other time in history have individuals had access to so much information at the touch of a button. This unprecedented access to information through the internet and the technology that allows internet access creates an environment where attention becomes a scarce resource. Our human brains have yet to catch up with the technological advancements and we simply cannot pay attention to it all.

A potential solution to mitigate the impact of the attention economy is a personal mindfulness practice. Mindfulness is a practice that can be traced back to Buddhism as a religion and to the story of the Buddha from almost 2,500 years ago. While we do not know the history of the Buddha (whose given name was Gotama) with absolutely certainty, and the legends differ based on the tradition that endured, the general story goes that Gotama left home as a young, privileged man and went out to learn about the suffering of the world. Buddhists believe that after years of searching, Gotama found enlightenment while meditating under a Bodhi tree. He spent the rest of his life teaching others about how to achieve this spiritual state through many concepts including mindfulness. The concept of mindfulness has infiltrated the

popular culture as well, even in regions where Buddhism is not practiced as the primary religion, and this practice has sparked interest by the scientific community to study the potential benefits. Research suggests that a mindfulness practice can support attentional control, decrease the impact of counterproductive emotions, and physically change the structure and function of a brain as imaged by MRI.

This literature review will focus on five key areas of the research on attention: the history of the attention economy, the modern attention economy, the neuroscience of attention, the impact of technology on attention, and the impact of mindfulness on attention. I will explore the intersection of mindfulness and the attention economy and make an argument for the benefits of a mindfulness practice as a personal strategy to combat the (very concerning) effects of our modern economy.

### **History of the Attention Economy**

The roots of the attention economy and the business models that drive it date back to the 1830s with Benjamin Day and the Penny Press. In those days, information was not readily available, and access was reserved for wealthy individuals who could afford to purchase a newspaper like the *New York Times* and the *Wall Street Journal* for six cents. Day disrupted the newspaper industry at the time with his news outlet *The New York Sun*, which was available for one sixth the price at one cent per paper. The publication did not set a high bar for the quality of its information but instead was focused on sensational news stories and allowed Day to build his business on sales quantity rather than copy quality. At one cent a paper, the sales of the paper did not even cover the costs to print, but this was not where Day intended to make his money. The readers were not his customers; the companies who placed ads in the papers to buy the attention of the readers were (Hendricks & Vestergaard, 2018). While Day likely could not have

predicted how this business model would be translated nearly a century later, he created a model that became the basis of our modern attention economy.

While we did not have the label the 1830s, the designation of the attention economy was birthed by economist Herbert A Simon in 1970. Simon, a psychologist, economist, and Nobel Laureate, said in the often-quoted lecture from 1971:

The wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention. (Crogan & Kinsley, 2012, p. 4; Rose, 2015, p. 42)

It may seem like Simon was ahead of his time, as life looked entirely different in 1971 than it does today in 2020. Simon made his declaration almost 20 years before the World Wide Web was born and an unimaginable amount of information became available with internet connection and the press of a button (CERN, 2019). In his writings and a lecture sponsored by Johns Hopkins University, Simon made a prediction based on his observation that humans were at the precipice of an attention economy when, information will be plentiful and attention would be in a short supply. He theorized that in the future, “the value of information (the stuff being produced) would trend toward zero, while the value of attention, which is owned by consumers but can be leveraged by companies that help them allocate it, would only rise” (Rose, 2015, p. 44).

Other economists solidified Simon’s prediction and by the 1990s, there were many prominent scholars and economists studying the Attention Economy, as scholar Tiziana Terranova (2012) calls it, the “new economy” or “digital economy” (p. 1). Scholars like Michael Goldhaber, Georg Franck, and Tristan Harris all speak about how the modern-day overload of information, made readily available by the internet and technological devices, means there is a

scarcity of whatever consumes it. In the case of understanding and digesting information, attention is the resource of which humans are in short supply (Crogan & Kinsley, 2012). Many believe this is the natural economy of cyberspace, as the internet is predicated on infinite amounts of information (Crogan & Kinsley, 2012; Terranova, 2012; Rose, 2015).

Michael Goldhaber (1997) predicted we would be increasingly focused on social networks and the places they are accessed since he believed that attention as a commodity is not a momentary circumstance but something that has prolonged effects. Goldhaber stated, “obtaining attention is obtaining a kind of enduring wealth, a form of wealth that puts you in a preferred position to get anything this new economy offers” (p.15). He theorized that attention cannot be quantified in the same manner as money but that it can be quantified through esteem. Those who have our attention are very powerful. “Hollywood” celebrities, for instance, have fans that have a vast amount of their attention. Attention cannot be quantified in dollars, but a celebrity very likely has so much attention that their fans will pay money in the form of movie tickets, concerts, and merchandise or in other ways to support or emulate the celebrity. People with the attention of others, can channel it to another person, company, or product in order to monetize it (Hendricks & Vestergaard, 2018). In this way, money is not replaced in the attention economy, rather it “flows along with attention” (Goldhaber, 1997, p. 16). While social media was not around when Goldhaber was speaking on the topic, his predictions ring true as we saw the rise of Instagram, Facebook, and Twitter in the 2000s.

In 1999, Georg Franck, a doctor of economics and early thought leader with Goldhaber, proposed attention as a new kind of capital: "This new market requires specific techniques of evaluation and units of measurement (algorithms, clicks, impressions, tags, etc.)" (as cited in Terranova, 2012, p. 4). Franck has continued to be a thought leader in the field. When explaining



why attention is such an important factor in the modern economy, Franck (2019) asks the following:

What is more pleasant than the benevolent notice other people take of us, what is more agreeable than their compassionate empathy? What is more inspiring than addressing ears flushed with excitement, what is more captivating than exercising our own power of fascination? What is more thrilling than an entire auditorium of expectant eyes, what is more overwhelming than applause surging up to us? What, ultimately, equals the enchantment sparked off by the delighted attention we receive from those by whom we are ourselves enchanted? – The attention of others is the most irresistible of drugs. To receive it outshines receiving any other kind of income. This is why glory surpasses power, and why wealth is overshadowed by celebrity. (p. 8)

Just like Goldhaber theory, Franck's analysis gives some indication as to why we are in an age in which attention is tremendously valuable, perhaps more so than money. While money will always be an important factor within an economy, so is celebrity and political power, which can be considered precursors to the flow of money. Many political events of our time are likely a result of the modern attention economy.

### **The Modern Attention Economy**

The advent of the internet in 1989 (CERN, 2019) was an important factor in the growth of the attention economy, but perhaps more impactful in accelerating what was already developing as a new kind of capital was the advent of the iPhone in 2007. This invention changed the trajectory of the economy because it made technology, and thus the World Wide Web and an innumerable amount of information, available to us in an instant, thus accelerating the

attention economy with an abundance of information and a lack of the thing that consumes it: our attention.

Tristan Harris, founder of the Center for Humane Technology, is a modern thought leader on the topic of the attention economy. A former Google design ethicist, he now studies how modern technology is hijacking our attention and downgrading our humanity (Mintzer, 2012). Harris argues that technology companies are in a “race to the bottom of the brainstem” (Center for Humane Technology, 2018), which means they are reverse engineering human instinct to get consumers addicted to devoting their attention to their product. For these companies, they win if they get your attention. The companies who win at the highest level are not only getting the consumers’ attention, they are also masterful at getting the consumer addicted to getting attention themselves. That is the way they get recurring attention. An example of this is a woman on Instagram. Instagram is a free app; this woman pays nothing to use the platform. Even without the transfer of money, Instagram is successful if they can feed her content in the newsfeed to keep her attention. But they have learned through an incredible amount of data and artificial intelligence that the best way to get her attention is to incentivize her to get her own attention on the platform. In this way, this woman is not only the consumer, she becomes the consumer and the product. That will simultaneously keep her coming back and contribute to others coming to the platform as well. This model works best when she stares at her iPhone, wanting to increase her followers and likes and get feedback on her looks. A company like Instagram makes money through advertisers that invest in advertisements on Instagram because of the huge following (Center for Humane Technology, 2018). This example can be extrapolated to people of different ages, races, ethnicities, genders, marital status, incomes, education, and employment; the tactics of these companies leave no demographic behind.

In his presentation titled “A New Agenda for Tech,” Harris (2019) quoted E.O. Wilson, an American biologist: “The real problem of humanity is that we have paleolithic emotions, medieval institutions and God-like technology.” To Harris, tech companies participating in the modern attention economy are an “existential threat.” He goes as far to say that the technologies that are competing for our attention are influencing our free will. An example Harris gives is YouTube, a free online video sharing platform. At some point between 2014-2015, YouTube decided to shift their focus away from clicks on a video and decided that a better metric for success would be the amount of time someone spent on the platform, watching videos – a pure attention metric. According to their data, in 2017, people around the world were watching a billion hours of YouTube content daily (Goodrow, 2017). A billion hours a day is a staggering statistic alone, but 70% of the billion hours of YouTube a day are videos that the watchers did not search for but were recommended via the algorithm, solidifying Harris’ argument that we are outmatched by tech companies in terms of free will. For example, if a teen girl looks at a dieting video, YouTube’s algorithm would show her anorexia videos because it knows that would keep her on the platform. Harris asserts this sentiment:

Tech platforms make billions of dollars keeping us clicking, scrolling, and sharing. Just like a tree is worth more as lumber and a whale is worth more dead than alive—in the attention extraction economy a human is worth more when we are depressed, outraged, polarized, and addicted. (Center for Humane Technology, 2018)

Harris believes that modern technology is not aligned with humanity’s best interests and that it is contributing to an attention economy that threatens our well-being, relationships, democracy and shared information environment (Center for Humane Technology, 2018; Mintzer, 2012).

The tactics of technology companies in the modern attention economy are not isolated to social media platforms. In fact, many different types of services offered online are free. While they do not require the exchange of money, these companies do demand to be paid for the service they provide with your attention. One tactic is for a company to offer choice when it comes to receiving a service. A simple example of this is Spotify, a music and audio platform whose mission is “to unlock the potential of human creativity—by giving a million creative artists the opportunity to live off their art and billions of fans the opportunity to enjoy and be inspired by it” (Spotify, n.d.).

Figure 1

Spotify Free	Spotify Premium
<b>\$0.00</b> / month	<b>\$9.99</b> / month Start your 30 day free trial* Family and Student offers available
<ul style="list-style-type: none"><li>✓ Shuffle play</li><li>✓ Ad free</li><li>✓ Unlimited skips</li><li>✓ Listen offline</li><li>✓ Play any track</li><li>✓ High quality audio</li></ul>	<ul style="list-style-type: none"><li>✓ Shuffle play</li><li>✓ Ad free</li><li>✓ Unlimited skips</li><li>✓ Listen offline</li><li>✓ Play any track</li><li>✓ High quality audio</li></ul>
<b>GET FREE</b>	<b>GET PREMIUM</b>

Note. Spotify subscription models (Kane, 2019).

Spotify offers an individual choice when it comes to using their platform; the individual can choose the “free” model and effectively pay Spotify with their attention to regular advertisements, or they can subscribe for a “premium” membership and pay a monthly fee to keep control over their own attention. In the modern attention economy, companies are commoditizing the consumer’s attention (Kane, 2019).

Another thought leader concerned about the impact of the modern attention economy is Jay Vidyarthi (2016), a researcher and teacher focused on the intersection of mindfulness and technology. Vidyarthi likens the impact of the modern attention economy and the tactics of advertising to pickpocketing. He believes that digital advertising is at the root of this economy and questions why an individual’s attention is allowed to be bought and sold without the permission of that very individual:

You volunteer to watch a video, browse a website or use an app, and the next thing you know, an ad has stolen your attention and slipped a message into your head. These ads play on your triggers and you’re wired to notice. You never agreed to this exchange. Boisterous videos, promoted search results, sponsored social posts, and relentless app notifications prey on your situation and hijack your mind. You don’t have a choice. But remember, in today’s economy, your attention is worth money! Doesn’t it seem unfair that it’s being stolen from you so often without your permission? (Vidyarthi, 2016)

Vidyarthi makes the point that this pickpocketing is not only feeding the bank accounts of big business, who use psychologists and data scientists with access to countless data points to tailor advertisements most likely to influence you, it is also impacting the general health and wellbeing of individuals. He argues that this type of economy is contributing to the mental health epidemic by using unfair tactics to capture our attention.

The impact of the modern attention economy and influence on the mental health epidemic is powerfully illustrated by a (2010) study designed by two Harvard psychologists, Matthew Killingsworth and Daniel Gilbert. Killingsworth and Gilbert created a smartphone app to monitor people's thoughts, feelings, and actions and analyzed over 250,000 data points to determine how happy the people were feeling when they were engaged in different activities throughout the day. The outcome of Killingsworth and Gilbert's (2010) study pointed to the fact that when an individual is not present to whatever activity they are involved in, they are less happy. Said another way, when their attention is elsewhere, their wellbeing is worsened:

The researchers estimated that only 4.6 percent of a person's happiness in a given moment was attributable to the specific activity he or she was doing, whereas a person's mind-wandering status accounted for about 10.8 percent of his or her happiness. (p. 932)

This study suggests that the constant hijacking of our attention to technology and our devices is not only costing us our limited attentional capacity, but it is actually making us less happy.

### **Research on Technology and Attention**

As the advancement in technology and access to unlimited information continues to accelerate, researchers have begun to dig into the effects of the ever-advancing technologies. As David Levy (2016), a technologist and professor at the University of Washington Information Schools eloquently noted:

The challenge we now face boils down to this: our devices have vastly extended our attentional choices, but the human attention capacity remains unchanged. And so, we must figure out how to make wise choices and to figure out what constitutes as a wise choice so we can use our digital tools to their best advantage, and to ours. (p. 3)

To determine how these technologies may serve us, it is best to know what effect they are currently having on our attention and our world. While there are many types of technology with varying effects on our attention, for the purposes of this discussion, the research focused on will include social media, smartphones and generational differences in the effects of technology.

### **Social Media**

The literature suggests that there are several factors in digital media, specifically in social media platforms, that are leading to widespread technology addiction. These include the absence of a stop sign, fear of missing out or FoMo (“fear of missing out”), and variable rewards (Ertemel & Aydin, 2018). The absence of a stop sign points to the lack of an end to the activity of viewing digital media. Technologists design for this by utilizing the infinite scroll feature in the case of Facebook or Instagram or the automatic play feature in the case of YouTube. These features hijack one’s attention so that the individuals are unaware of time passing because there is not a natural stop point. “Fear of missing out” is a phenomenon that describes the stressful feeling that something exciting is happening somewhere else in which the person not included. Platforms like Facebook and Instagram are masterful at feeding content that makes someone feel like they are missing out. Finally, variable rewards refer to the type of stimulation known to drive addictive behavior in the brain. More so than consistent rewards, variable rewards administered at different intervals and without consistency make individuals curious and hypothesize on how to get more rewards. In social media, these rewards are administered as likes, shares, and comments (Ertemel & Aydin, 2018).

The design of social media also contributes to a phenomenon called “The Vortex.” This phenomenon is part of the reason why individuals are so compelled to spend increasing amounts of time on social media:

[The Vortex is] a user-behavior pattern that begins with a single intentional interaction followed by a series of unplanned interactions. This unplanned chain of interactions creates a sense of being “pulled” deeper into the digital space, making the user feel out of control. (Moran & Salazar, 2018, para. 2)

The Neilson Nelson Group, a firm focused on research-based user experience, conducted a series of international studies called the Life Online Project to study how people use the web. They determined a number of factors that contribute to the feeling of getting sucked into the Vortex. One of these is notifications, specifically social media notifications. They found that 25 % of multitasking and task-switching entries (where users moved back and forth between various activities) involved at least one social media channel. This suggests that people task switch to social media sites resulting from a notification when they are doing other tasks (Moran & Salazar, 2018).

Another tactic of social media platforms that is designed to keep our attention on the platform for longer is called the “hide-the-milk” tactic (Moran & Salazar, 2018). This tactic is named for the strategy grocery stores use to entice customers to purchase more by positioning the milk at the back of the store. They know that many customers go to the store to quickly buy a gallon of milk so by store management placing it at the back of the store, the customer is exposed to many other products along the way. Technologists and social media designers do something similar when they invite the user to follow up on a notification. Instead of allowing the user to click on the notification to bring them to that exact interaction, the platform drops them in the newsfeed, leaving them to click around to find their notification. This ensures they are exposed to their feed before accomplishing the specific task of viewing a notification. Social



media is designed to maximize the time they are on the free platform thus causing them to “pay” with their attention (Moran & Salazar, 2018).

Types of social media use matter when looking at its impact on mental health and attention. The literature suggests that passive social media use (PSMU) is associated with higher levels of interest loss, concentration problems, and fatigue, and loneliness as compared to active social media use (ASMU) (Aalbers et al., 2019). PSMU is assessed by the time an individual spends scrolling on social media outlets without posting, liking, or commenting. ASMU is the time spent engaging with likes, posts, and comments (Aalbers et al., 2019).

### **Smartphone**

While the literature is still in its infancy, smartphone use is a focus of the research regarding the effects of technology. Smartphones are becoming ubiquitous around the world but particularly in the US. In 2019, 81% of adults in the U.S. owned a smartphone. This is up from just 35% in 2011, less than a decade ago (Pew Research Center, 2019). Literature suggests that different types of smartphone use may be impacting our ability to pay attention in everyday life. To expand on previous research that suggests smartphone use may be negatively influencing cognition, Marty-Dugas et al. (2018) designed a study utilizing two questionnaires for participants to self-report their general smartphone usage and their absent-minded smartphone use. They then utilized four scales for all participants that assessed attention lapses, attention-related errors, spontaneous mind wandering, and deliberate mind wandering. Their research suggests everyday smartphone use is likely not inherently bad, but that absent-minded use of smartphones increases the likelihood of experiencing other inattention episodes in day-to-day life. This study suggests strong positive correlations between the smartphone use questionnaires and the measures of inattention (Marty-Dugas et al., 2018).

Thorton et al. (2014) designed a study to identify the impact of the presence of a smart phone on attention and task performance. Researchers recruited college students to perform two different tests with and without smartphones nearby. These included the Trail Making Test (TMT) and Digit Cancellation Task. The Trail Making Test is a test used in neuropsychological evaluation and requires attentional control, mental flexibility, and motor function as it requires the individual to draw a line to connect a large number of sequentially labeled circles in random order. The Digit Cancellation Task is a task used to assess attention, cognitive capacity, and executive functioning by asking the individual to identify and cross out or add certain digits. Both tests had different levels of difficulty. At the start of the experiment, the experimenter “accidentally” left either her cell phone or a notebook (control group) on the participant’s desk. While not a large study, and focused on college students, this research found that the individuals performed worse on the attention tasks when a cell phone was present. This was especially evident as the tasks increased in difficulty and required greater attentional and cognitive demands. The study suggests that regardless of use, the mere presence of a phone is influencing one’s ability to pay attention (Thorton et al., 2014). A similar study conducted by University of Texas researcher Adrian Ward (2017) yielded the same results, and even identified the phone’s status had no bearing on the result of the study:

It didn’t matter whether a person’s smartphone was turned on or off, or whether it was lying face up or face down on a desk. Having a smartphone within sight or within easy reach reduces a person’s ability to focus and perform tasks because part of their brain is actively working to not pick up or use the phone. (Ward et al., 2017)

More research is necessary to understand the full impact of smartphone proximity, but early studies suggest that there is an impact regardless of active use.

While the research is limited as to the long-term impact of smartphone use on attentional capabilities, there is early evidence to suggest that there is an impact. Lee et al., (2015) designed a study to determine if there was a connection between an individual's degree of "addiction" to a smart phone and the ability to achieve "flow." Flow is a concept coined by Mikhail Csikszentmihalyi (2008) that refers to "a state of concentration so focused that it amounts to absolute absorption in an activity" (p. 4). The study included Korean college students and utilized questionnaires to measure three things: smartphone addiction, tendency for self-regulated learning, and capacity for learning "flow." Lee et al. (2015) found that individuals who scored highest on smartphone addiction scored lower on the learning and flow scales. While the study design could not differentiate correlation from causation, it does suggest that those who are addicted to their smartphone also struggle to achieve flow.

### **Generational Differences**

The American Psychological Association did an online survey within the US in August 2016 with over 3,500 adult respondents. This report showed that 86 % of adults are constantly or often checking their email, texts, and social media accounts. This survey was primarily focused on stress in America and found that those who are constantly checking their devices are more stressed on average than those who are not. Utilizing a 10-point scale, the average stress for constant checkers is 5.3, while the average stress level for those who do not frequently check notifications is 4.4. This is especially profound for Americans who are employed and check their email on days they do not work, which leads to a stress level of 6.0. The survey highlighted three areas of note: stress level of constant checkers, the struggle parents have in managing their children's use of technology, and the effects of social media (Bethune & Lewan, 2017).

Almost half of the respondents say that regulating their children's screen time is a constant battle and more than half report feeling that their children are attached to their phones. Forty-two percent of constant checkers report concern about the negative effects of social media on physical and mental health. Profoundly, 65% of Americans in the study agree that periodically unplugging is important to their mental health, but much fewer are willing to do it – just a mere 28% (Bethune & Lewan, 2017).

The literature on the impact of technology is especially profound in adolescents. Data utilized from nationally representative surveys of US Adolescents Monitoring the Future (MtF) and the Youth Risk Behavior Surveillance System (YRBSS), data on suicide deaths found that adolescents aged 13-18 who spent more time on social media were more likely to report mental health issues as compared to adolescents who spent more time on non-screen activities (Twenge et al., 2010). This is not unsurprising as prior research suggests in person social interaction provides more emotional closeness than electronic social interaction. Depressive symptoms, suicide-related outcomes, and suicide deaths among adolescents all rose during the 2010s. These increases follow a period when mental health issues were declining or stabilizing, and the increase was driven primarily by females. Overall, the results show a clear pattern linking screen activities with higher levels of depressive symptoms and suicide-related outcomes as compared to non-screen activities. All activities associated with higher depressive symptoms or suicide-related outcomes involved screens, and all activities associated with lower depressive symptoms or suicide-related outcomes did not involve screens (Twenge et al., 2010).

The I-gen generation (born between 1995 and 2012) is spending so much time on their phones that it is negatively affecting their lives in many ways. Research shows they spend less time away from the house, are dating less, having less sex, in less of a rush to drive, and not

hanging out with their friends as much as prior generations. In doing less of these activities, they are spending more time on their phones, which means they are more likely to be depressed (Twenge, 2017). According to Twenge (2017):

Psychologically, however, they are more vulnerable than Millennials were: Rates of teen depression and suicide have skyrocketed since 2011. It is not an exaggeration to describe iGen as being on the brink of the worst mental-health crisis in decades. Much of this deterioration can be traced to their phones" (Para. 4).

While it does appear that there are generational differences when it comes to the impact of technology on attention, more research is required to determine exactly how different the generational experience is.

### **Neuroscience of Attention**

The human brain is an incredible display of evolution and has become the ultimate tool for the modern person. The brain is constantly receiving inputs from the environment. Sometimes these inputs from the environment are relevant and sometimes they are not. For example, the keyboard and computer I am looking at are relevant for my task of writing this paper, but the wind blowing the tree outside my window in my periphery is not. If my brain were focused on the inputs from outside my window, I would never get any writing done. Within the brain exists a set of processes that help sort and filter the inputs that are coming in and these processes are called "attention" (Vecera & Luck, 2002).

In order to understand the neuroscience of attention, one needs to recognize the different types of attention. There are various types of attention, including attention in which stimuli are received by the senses – visual, auditory, touch, etc. – and attention associated with behavioral tasks and the coordination of tasks. One way to classify these types of attention is as overt

attention and covert attention. Overt attention is the attention that happens when someone directs their eyes toward something. Covert attention is when someone pays attention without moving their eyes (Ordikhani-Seyedlar, 2017). A simple example of the coordination of these two types of attention is driving. When driving, one is directing their gaze forward toward the road, which is an example of overt attention. Covert attention is also happening because this person is taking in information from the periphery at the same time; as humans, we do many things all at once. Attention is involved in selecting current behavior and then switching to other behaviors seemingly at the same time (Vecera & Luck, 2002). Attention can also be classified as passive and effortless versus active and voluntary. The literature references for this distinction as “bottom up” and “top down” (Bisley & Goldberg, 2018).

Attention is necessary for eliminating sensory inputs or behavioral tasks that are irrelevant at a specified time. There are likely many areas of the brain that are involved in the different types of attention, but research shows that there are two key regions of the brain associated with attention: the parietal lobe (Vecera & Luck, 2002; Bisley & Goldberg, 2013; Marchand, 2014) and the prefrontal cortex (Bichot et al., 2019; Marchand, 2014; Ordikhani-Seyedlar, 2017).

The parietal lobe is associated with attention as well as sophisticated motor planning since this area processes information from the body’s senses. The somatosensory cortex, which resides within the parietal lobe, is essential for processing sensory information from different areas of the body. The somatosensory cortex is organized in a way that links different spatial relationships. For example, the part of this cortex that processes information from the lips is next to the area that processes information from the jaw. The parietal lobe associates somatosensory, visual, and auditory activity and transmits spatial information to the motor system. This region is

important in attentional processes because it selects important stimuli from the environment (Goldberg, 2001; Vecera & Luck, 2002). It is because of the parietal lobe that I can keep my eyes focused on my computer screen and not the windblown tree outside my window while writing this paper. Research also suggests that the parietal lobe acts as a “priority map” for behavioral activity. This means that the parietal lobe processes both bottom-up information and top-down information to determine what behavior should be generated and when (Bisley & Goldberg, 2013).

The prefrontal cortex is located within the frontal lobe and it is important for higher-level cognitive functioning or executive function. Executive functions are things like decision making, self-control and acting with a long-term plan in mind. It controls the beginning-to-end process of sequential acts toward a goal (Fuster, 2001; Morecraft & Yeterian, 2002). Some say that if humans did not have the prefrontal cortex, we would be ruled by our desires and impulses without regard to consequences (Dingman, 2019). Attention is a complex process that involves selecting stimuli and running it through a filter to determine if it will be of service to the individual based on long-term choice, and the prefrontal cortex is the area that supports this complex process.

### **Mindfulness Research**

In the past several years there has been an explosion of scientific research as it relates to mindfulness and meditation. One of the most important factors in mindfulness research is the definition of mindfulness used. While there is not one perfect definition of mindfulness, most research in this area acknowledges and utilizes a version of Jon Kabat Zinn’s mindfulness definition: “mindfulness is awareness that arises through paying attention, on purpose, in the present moment, non-judgmentally” (Kabat-Zinn, 2005; as cited in Raffone et al., 2010; as cited

in Sedlmeier et al., 2012). Meditation, similarly, has many varieties. For simplicity and based on the literature, meditation can be classified into concentrative meditation and mindfulness meditation (Sedlmeier et al., 2012). For the purposes of this paper, a mindfulness meditation practice in a western context is used.

### **Mindfulness and Attention**

Lutz et al. (2008) found that meditation that focuses on keeping attention on an object may train the skill of sustained attention. As a byproduct, the skill of awareness can also be cultivated since it requires the recognition of distractions, disengagement from those distractions, and redirection to the object of focus. The researchers found that ongoing practice of focused attention leads to improvement in concentration and selective attention tasks (Lutz et al., 2008). Similarly, researchers found that meditators can relearn automatic behavior by directing their attention to the information contained within each moment. This research suggests that the shift in perspective of meditators enables them to become flexible and less automatic when responding to the environment (Sedlmeier, et al., 2012). When thinking about this within the context of neuroscience, it is likely that these researchers observed a change in the prefrontal cortex.

There is a main question that arises in the literature: How is mindfulness meditation different from relaxation practices? Sedlmeier et al. (2012) concluded that meditation is not simply a relaxation technique, and there are differences in outcomes when comparing meditation to relaxation techniques as a result of a meta-analysis analyzing the psychological effects of meditation. The first of these, they found, is effective on cognitive processes, likely due to the reduction of counterproductive emotions and feelings. While it is important not to overstate the findings, this large meta-analysis does find meditation has a strong effect in reducing negative



personality traits, reducing stress, and improving attention and mindfulness (Sedlmeier et al., 2012).

When looking at mindfulness meditation on a broad level, research suggests that this type of training improves attention. However, what is sometimes not clear in the literature is the type and amount of time practiced required to see results. Across two unique study designs, Norris et al. (2018) sought to understand what effect, if any, a small dose of mindfulness meditation had on attention in novice meditators. One study design utilized the Flanker Task to evaluate attention, and the other used the Attention Network Test (ANT), two reputable tests measuring attention. These studies suggested that a brief, 10-minute mindfulness meditation protocol (like the beginning of Jon Kabat Zinn's Mindfulness Based Stress Reduction training) in novice meditators leads to a better ability to focus and respond correctly than those in the control group. This leads us to believe that brief mindfulness meditation may improve executive attention. The authors of these studies make note that a careful delineation of task requirements may be required to truly understand the complex relationship between mindfulness and attention (Norris et al., 2018).

Another way to determine the effects of mindfulness is to look at functional neuroimaging studies. Marchand (2014) found that there are several regions in the brain that are impacted by mindfulness practice. It is important, again, to note that there is a variability in mindfulness practices and methods used in studies, which is a weakness of the analysis. Even with that note, however, there is consistency among the literature in neuroimaging of mindfulness practitioners in whatever form they may be practicing. Based on Marchand's analysis, there is strong evidence to suggest that mindfulness impacts the attention networks, including parietal cortical regions and temporal cortex. The literature suggests the training

modifies the neural processes in all the regions of the brain where neuroscientists believe attention is improved (Marchand, 2014).

Similarly, Hölzel et al. (2011) were interested in understanding the neural mechanisms associated with the mindfulness meditation trainings that have become very popular. One of these mindfulness meditation trainings is Mindfulness-Based Stress Reduction (MBSR), which has yielded positive effects on psychological well-being. Hölzel et al. designed a controlled longitudinal study to understand if the MBSR program produced changes in brain gray matter concentration. It was long accepted that neural systems were developed and fixed and did not modify much as an individual aged. A growing body of literature illustrates the contrary and that neural structure can change as a result of training, even in adults.

This study included participants that were enrolled in MBSR courses held at the University of Massachusetts Medical School who were seeking stress reduction. Participants reported if they were physically and psychologically healthy and not taking any medications; if they self-reported positively to the above and had not taken any meditation classes in the past six months, were 25 to 55 years old, and had no contraindications for MRI scanning, they were included in the study.

After completion of the eight-week intervention, MBSR participants reported spending an average of 22.6 hours engaged in practice as it relates to MBSR. At the time of the first brain scan, there was no difference in gray matter concentration between the MBSR group and the wait-list control group. After the intervention period, there were significant increases in several brain regions including the left hippocampus, temporoparietal junction, posterior cingulate cortex, cerebellum, and brainstem nuclei in the MBSR group, which suggests that structural changes occurred likely as a result of participation in the mindfulness training program. These

regions of the brain are associated with emotional regulation, self-embodiment, self-relevance, arousal, and memory. In the control group, no significant changes were realized in the gray matter concentration. This was a very small study design and included a mostly Caucasian participant group with a high level of education (Hölzel et al., 2011). There was also a self-reported component of the program. Individuals reported on the number of hours they spent in practice, which allowed room for over and underestimating. The study will certainly need to be replicated and enlarged before the findings can be substantiated.

Lazar et al. (2005) hypothesized that meditation practice might be associated with changes in the brain's physical structure. This hypothesis came after reviewing previous research that shows long-term meditation produces changes in mental state as well as resting brain patterns that continue beyond the duration of meditation practice. The question was if these resting brain patterns were revealed in long-term physical changes in the brain, likely in areas responsible for somatosensory, auditory, visual, and interoceptive processing.

This study recruited 20 individuals with significant insight meditation practice to participate in the study. These individuals were not monks, but rather individuals who led typical western lives and incorporated meditation practice into their daily routine. They were required to have participated in at least one week-long insight meditation retreat. The control group matched the meditation group in terms of sex, age, race, and years of education but had no meditation or yoga experience. The thickness of the cerebral cortex was measured using a well-validated computation approach and was estimated from two magnetization-prepared rapid gradient echo structural images collected from each participant.

The results of this study do indeed suggest that regular meditation practice is associated with increased thickness in part of the cortical regions of the brain associated with auditory,

visual, and interoceptive somatosensory functions. While not a primary focus of the study, the results also suggest that regular meditation practice may slow age-related thinning of the frontal cortex after identifying the cortical thickness of some of the older participants. Potential limitations of the study include the very small size – only 20 individuals in the meditation and 15 in the control group – and the fact that the study did not control for the variable effects of aging on frontal cortex (although it did match for age in the meditation and control groups). The design of this study was also cross-sectional, so the findings are correlational, and it is not possible to infer a causal relationship between the cortical thickness and meditation. That would require a long, longitudinal study design.

Chin et al. (2020) conducted a theoretically driven, randomized controlled trial to test the mechanisms of mindfulness training that likely drive improvements in attentional control. Participants were randomly assigned to one of three conditions: the first was monitor and accept (MA) training, a standard eight-week mindfulness-based stress reduction (MBSR) intervention that included cultivation of both monitoring and acceptance skills; the second was monitor only (MO) training, a well-matched modified eight-week MBSR-adapted intervention that focused on monitoring skills only; or the third, control, which was no treatment (NT). Each group completed a baseline and post intervention self-report that evaluated trait attentional control along with a listening task at baseline and postintervention. The findings suggest that present focused monitoring skills drives improvements in momentary attention control related to the mindfulness training and fosters greater trait attentional control (Chin et al., 2020).

Researchers Moore et al. (2012) aimed to address an important question: What is the minimum effective dose of mindfulness practice that may achieve greater attentional control for the practicing individual? This is a very relevant question, as it helpful to understand the lower

boundary of a mindfulness practice since the barrier to entry for the lay person subjected to the modern attention economy is likely time. For the researcher's study, participants in the mindfulness group were asked to engage in a mindful breathing exercise for 10-15 minutes a day for a period of 16 weeks. In order to approximate attentional control, Moore et al. used the Stroop Test. The Stroop task involves a reading of words in various colors. For example, "RED" presented in the color blue. The design of this test is thought to show cognitive, as good performance would indicate low automaticity of one's responses. (Moore et al., 2012).

While individuals engaged in the Stroop test, their physiological indicators were recorded through an EEG, which aimed to measure indicators of neuronal processes. Compared to those on the non-active waitlist, the study participants experienced improved neural functioning that is indicative of enhanced focused attentional processing and less resource intensive object recognition processes. These results suggest improvements of neural processing related to attentional core processes with only 10 minutes of mindful breathing exercise performed every day for a period of 16 weeks. It is important to note that this was a very small study, with only 40 participants in the active group and with a very specific type of mindfulness exercise. It does, however, give some hope to those who are considering engaging in a short, daily mindfulness practice as a means to support attentional processes (Moore, et al., 2012).

### **Mindfulness and Technology**

While research is still in its nascent stages, there are early studies that identify the relationship between mindfulness practices and technology. One of these, conducted by Lan et al. (2018) studied the impact of a mindfulness intervention on Chinese college students who, based on the Mobile Phone Internet Addiction Scale (MPIAS), were addicted to smartphones. The students were split into two groups: the mindfulness instruction group and the control group,

which was given a lecture on the effect of smartphone addiction. The mindfulness group received a series of training that included meditation and relaxation training and was given homework to practice these techniques daily. Compared with the control group, after eight weeks the mindfulness group had significantly less smartphone use time and significantly lower MPIAS scores. While this was relatively small study and only included Chinese college students, this type of study suggests that mindfulness could be a useful intervention for individuals dealing with various technology addiction (Lan et al., 2018).

### **Challenges and Limitations of Mindfulness Research**

Mindfulness research has its challenges, and the current literature should be viewed with a critical eye. The body of mindfulness literature has grown exponentially since the early 2000s and with this explosion came some misinformation and poor methodology (Van Dam et al., 2018). One challenge in the literature stems from the definition of “mindfulness.” There is no consensus among the research on the definition, some use the word to explain a mental skill of conscious awareness and others refer to the formal practice of attending to the breath or another object of attention. It is important that the reader have a good understanding of the definition used for each study (Van Dam et al., 2018).

There is also some concern over the methods used when studying mindfulness and the inherent difficulty in operationalizing and measuring mindfulness. While much of the literature utilizes objective measurements like brain scans, some use only self-reported measures. Self-reported measurements have inherent flaws and have the potential for demand characteristics:

One who has practiced mindfulness meditation may understand and value items differently than someone who has not practiced) – a potential conflation of desire to be

‘mindful’ with actually being ‘mindful’... Moreover, mindfulness questionnaires do not always correlate with mindfulness meditation practice and the underlying latent variable influencing item response on certain scales may be reflective of some general feature such as inattentiveness. (Van Dam et al., 2018)

While these concerns with the current mindfulness research should not be a reason to throw out all the studies and begin again, there should be an ongoing focus on replicating the studies, utilizing biological efficacy measures and utilizing a common definition of mindfulness. There should also be caution taken when portraying mindfulness as a “cure-all” as there are important populations and circumstances where mindfulness practices are contraindicated (Shonin et al., 2014).

### **Mindlessness**

Ellen Langer was an important early thinker in the academic study of mindfulness. As a social psychology researcher, she focused on mindless behavior, or behavior that becomes nonconscious over time. Back in 1978, Langer observed that much of contemporary psychological research assumed that people are consciously processing information to understand their world and act on those understandings. In some of her seminal research on mindlessness and automatic behavior, Langer theorized that, while many tasks are completed mindlessly, there is an opportunity to move them to conscious behavior with some effort (Rosenburg, 2004), essentially, moving from mindlessness to mindfulness. Many have noted since then that an individual’s ability to exercise complete, intentional control is limited and that much of an individual’s psychological life is lived based on nonconscious means unless practiced (Bargh & Chartrand, 1999).

This, of course, is helpful. If all action required very deliberate thought, it would take herculean effort to do certain tasks. A personally relevant example of this was my experience as a soccer player and athlete. While I was learning to kick a soccer ball, it took a tremendous amount of effort and focus to think of all the actions, muscles, and techniques to effectively do those things. Luckily, over time, as I practiced nearly every day, I was able to automate this behavior so that kicking a soccer ball felt just as natural to me as walking. It benefits us that we can automate certain behaviors. This is not a new concept as philosopher A. L. Whitehead stated a century ago:

It is a profoundly erroneous truism, repeated by all copy-books and by eminent people making speeches, that we should cultivate the habit of thinking of what we are doing. The precise opposite is the case. Civilization advances by extending the number of operations which we can perform without thinking about them. Operations of thought are like cavalry charges in a battle—they are strictly limited in number, they require fresh horses, and must only be made at decisive moments. (as cited in Bargh & Chartrand, 1999, p. 464)

While Whitehead's sentiments ring true and we all have felt the benefit of automation, Langer argued that people automatize too quickly and that it is likely not in our best interest to behave automatically all of the time and that doing so makes us susceptible to effects of cognitive bias and other outside forces (Rosenburg, 2004).

It is not a far stretch to relate this type of mindlessness to the predicament of the attention economy. Our tendency to behave automatically predisposes us to manipulation by the tools and technologies of the modern economy. In essence, we may be outmatched.



### **Mindfulness and Attention Economy Discussion**

Ideally, we would not live in a world where the dominant economy is predicated on hijacking our attention. But in 2021 we find ourselves in this exact predicament. And while much of the impact of the attention economy seems grim, mindfulness has emerged as a personal solution. The technologists for social media platforms, smartphone apps, and other technology companies are preying on us and using our attention as a commodity to be sold. So, what can we do about it? We must find a way to take our attention back if we are to live consciously:

If we desire a future that avoids the enslavement of the propaganda state as well as the narcosis of the consumer and celebrity culture, we must first acknowledge the preciousness of our attention and resolve not to part with it as cheaply or unthinkingly as we so often have. And then we must act, individually and collectively, to make our attention our own again, and so reclaim ownership of the very experience of living. (Wu, 2016, p. 353)

Research has shown that mindfulness may support attentional capabilities, but it is unlikely we will be able to simply resolve to be more intentional. For greater control over our own attention, we need to practice. Thought leaders in this budding field are thinking through strategies for more mindful use of technology, how we may use our attention as activism and how we may utilize current technological advancements to be more mindful. This work is not without critics, some of them believe that using mindfulness as a way to cope with an unhealthy society is not an ethical use of the Buddhist derived practice.

## Mindful Technology

David Levy in his (2016) aptly named book *Mindful Tech*, made the argument for individuals engaging in exercises to hone their “digital craft” through practice and training (p.39). Levy realized that, short of a wholesale rebirth of our technology and economy, we would need to learn healthy ways to engage with the increasing access to information and the advancement of strategies keeping us addicted to our technologies. In order to learn these strategies, Levy suggests individuals embark on exercises and experiments to strengthen two skills: task focus and self-observation/awareness (p. 41).

As the primary place to start with task focus training, Levy suggests a mindful breathing exercise. This exercise is not unlike those taught in a variety of settings including yoga and the common mindfulness training program, Mindfulness Based Stress Reduction (Chin et al., 2020). In this exercise, individuals pay attention to the sensations of the body when breathing in and out, which can allow them to receive feedback from both physical and emotional states. Levy introduces the exercise as a simple four step process:

1. Adopt a posture that is both relaxed and alert. Example: sitting upright in a chair with feet firmly on the ground.
2. Begin attending to the sensations of your breathing. Identify a place in your body (your belly, chest or nostrils) where you can feel the physical sensations that arise as you breathe in and out.
3. Notice when your mind wanders away from the sensations of the breath. Inevitably, you will lose touch with the breath. When this happens, briefly notice where your attention has gone (to future planning, a memory of an event from years ago, etc.).

4. Bring your attention back to the breath. Once you've noticed that your mind has wandered, return to sensations of the breath. However many times your mind wanders away, just keep bringing it back (p.186)

This exercise is relatively simple, but it is not easy. Even in its simplicity, it is one of the best exercises an individual can do to strengthen attention. In learning this exercise, many people discover how often their attention is pulled away from the breath seemingly without their permission. This experience is translatable to what is happening to us when our attention is drifting toward our devices, social media, and other technologies without our conscious intention to do so. Even 10 minutes a day of practices like this may have a measurable impact on our ability to pay attention (Moore et al., 2012).

Other exercises recommended by Levy expand upon the foundation of a regular mindful breathing practice and include those focused on self-awareness while engaging with different types of technology. Some of these exercises include "Observing Email" and "Focused Multitasking," whereby individuals consciously engage in certain behaviors, like engaging with their email inbox, and observe and record what they are thinking, feeling, and doing. In the case of email, the most common realization is that strong emotions cause the individuals to check their email more than is likely useful or healthy (Levy, 2016). In the multitasking exercise, many individuals notice they are "haphazard" in their multitasking and many times attention is not focused on what they believe they should be doing and is more likely to be pulled away. Some individuals noticed they were likely to multitask when they were feeling boredom, anxiety and restlessness (Levy, 2016).

Developing self-awareness and observing the way we engage with technology, and thus the attention economy, is important. As Howard Rheingold aptly asks, "Are you captain or

captive of your attention muscles?” (as cited in Levy, 2016, p.194). Without this awareness, it is likely that we do not even know how often our attention is captured and when we are or are not in control of this valuable resource.

### **Attention Activism**

Jay Vidyarthi (2016) coined the term “attention activist” in order to inspire others to combat the negative effects of the attention economy, activism being vigorous action to achieve political, social or economic goals. At first blush, attention may not seem to be of importance in a political, social, or economic agenda, hopefully this paper has made the case that the attention economy is and should be a concern of all of the above. Therefore, attention activism is an effort to subvert the systems that disrupt our right to a freedom of attention (Vidyarthi, 2016). And, like Levy, Vidyarthi believes we need to actively practice or stand up against the companies and the system that threatens our well-being for profit. In order to stand up, we should practice mindfulness, which emerges as a technique which, helps us to choose what we pay attention to and why.

Vidyarthi (2016) is inspiring not only individuals to engage in mindfulness practices to take back their own attention, he is inspiring technologists to become attention activists and to develop tools which, help us to reclaim choice. In some ways, there is irony associated with the idea of creating technology to deal with technology. But along with Harris and the Center for Humane Tech (2018), Vidyarthi (2016) and others believe we need organizations to focus on the problems of our attention economy in addition to individuals. And ideally, we have regulations focused on addressing the business strategies, but until then attention activists need to fill the gap. Some examples of tools developed by attention activists are AdBlock, a browser extension to block advertisements online (Vidyarthi, 2016), Freedom, StayFocused, or Limit, all focused

on blocking certain websites to help with productivity and focus (Dempsey, 2018). These tools automatize our choice to stay away from attention-sucking platforms without leaving it up to our own devices. Of course, some of these tools require paid subscriptions, which then means we are paying money in order to not contribute to the attention economy. That becomes its own type of economy altogether. Ultimately, we can employ techniques to take back control of our attention; these techniques do not need to cost money (mindfulness can help us discover when to disconnect), but they can.

### **Mindfulness Apps and McMindfulness**

The ongoing irony of utilizing technology to combat technology is no better depicted than in the exploding mindfulness app industry. To me, it seems like a great idea. Since we are already spending inordinate amounts of time on our devices, we might as well use them to learn the practice of mindfulness! It is true that mindfulness apps are bringing this practice to many more people than would likely have found the practice other ways. The mindfulness app business has turned into a competitive market likely worth nearly two billion dollars by 2022 (LaRosa, 2019). My quick Apple App Store search resulted in over 1000 applications when searching the term “mindfulness.” Based on their research and conversations with meditation experts, *The New York Times* came out with a 2021 article declaring Headspace and Calm as the top two mindfulness applications (Arpaia, 2018). The price tag for Headspace comes in at \$70 per year and gives users structured “packs” or courses that focus on different types of meditations for specific goals like Balance, Coping with Cravings, Depression, or Grieving. Calm is a similar price point at around \$70 per year and offers guided individual exercises, flexible meditation timers, and different types of ambient music. Some believe Calm is a good application for more experienced meditators who do not need structured courses (Arapaia, 2018).

With so many different mindfulness applications, there are varying degrees of efficacy. While ideally anything that hits the market would include significant research: both clinical trials and studies – we can see by the speed with which they are coming to market – many do not. Judson Brewer is an addiction psychiatrist and the brain behind two apps focused on smoking cessation and mindful eating worries about this phenomenon:

We've seen companies make all sorts of claims – I won't name any in particular but they have to do with apps and mindfulness training and subscription services to their apps – they say 'based in science' and to my knowledge there's at least one company that hasn't published any data on their apps but they're citing scientific research about mindfulness in general. (as cited in: Tlalka, 2016, para. 33).

Because mindfulness has the potential to help people, we may want to sell the practice to audiences far and wide. This is very easily scalable through self-guided apps. But is it the right practice for all people? It turns out mindfulness practices are contraindicated for certain populations, and in some instances, even a simple meditation practice may result in adverse experiences for certain populations (Van Dam et al., 2017). The Headspace course on depression, as an example, could be dangerous for those who are on the higher acuity side of depression and could benefit from more intensive therapy. While Headspace does not sell itself as a solution for individuals who are clinically depressed, it might entice someone to forgo more intense levels of treatment for the self-guided app. The availability and promotion of mindfulness as a cure-all is perhaps not just false; it could also be dangerous. This is one of the major concerns over the popularization of mindfulness apps; for some they could be doing more harm than good.

Mindfulness divorced from its Buddhist roots and applied with a specific purpose in modern economy has its critics. The term McM mindfulness, refers to “a commercialized, sanitized and white-washed version of the practice” (Gelles, 2016, p. 204). The idea of “McMindfulness” is what makes the practice of mindfulness palatable for a corporation or the general public and divorces the practice from its Buddhist roots. Many believe that rather than applying mindfulness as a means to awaken individuals and organizations from the undesirable roots of greed, ill will, and delusion, it is now being pitched as a band-aid – therapeutic self-help technique that can actually reinforce those roots. Ironically, the very corporations who are playing within the attention economy are implementing practices to help their employees be more productive and thus padding their bottom line:

Simply using mindfulness as a technique to improve performance and make more money, the argument goes, is more about building up the ego than it is about breaking down the self. It’s a fear stoked by comments like the ones made by Arianna Huffington, who has been unabashed in her belief that mindfulness is an enormously practical tool. “There’s nothing touchy-feely about increased profits,” she said. “This is a tough economy. Stress reduction and mindfulness don’t just make us happier and healthier, they’re a proven competitive advantage for any business that wants one.” True as that may be, her comments are catnip for critics assailing the mingling of capitalism and contemplation. And for traditionalists, those are fighting words. (Gelles, 2016, p. 23)

So then this is confusing as it relates to a personal strategy. Are we able to use the same technique that companies are using to train their employees to become more effective at handling the deleterious effects of stress and impact the company bottom line by creating superhuman producers? Is it odd that the same person who is coming up with strategies to continually

capture our attention and sell it for profit may also be a practitioner of mindfulness and is utilizing the practice to become better at their job and make more money?

Oddly enough, some of the tech companies that are contributing the most to our attention economy are also the most interested in mindfulness strategies for a more productive workforce. An example of this type of employee mindfulness program in the tech world is program, Search Inside Yourself. The goal of the program was to help employees develop mindfulness and overall emotional intelligence skills to create the conditions for individual and collective thriving (Tan, 2012). The thought was if employees could develop these skills, they may be more likely to succeed in work and life, and therefore, the business' bottom line may benefit. The program focused on attention training, self-mastery, and creating useful mental habits (Tan, 2012). While a very successful program at Google and is now delivered as a curriculum to companies worldwide, I do wonder if mindfulness skill development by tech companies may be contributing to the attention economy by making a more productive and focused workforce.

### **My Experience of Opting Out of the Attention Economy**

As a personal experiment for this thesis, I embarked on a four-week journey to become mindful of the effects of the attention economy. As an exercise in Mindful Tech, Levy (2016) recommends "Mindful unplugging" (p. 131). In this relatively self-explanatory exercise, individuals choose to abstain from certain technologies for a defined period of time. The activities and duration are determined by the individual. While there are many aspects of the modern attention economy, I found that my attention was being captured most by my smartphone and even more specifically, the social media applications of Facebook and Instagram, so I decided to abstain from these. The business models of Facebook and Instagram (both owned by Facebook) are attention based. When reading the mission statement:



Facebook's mission is to give people the power to build community and bring the world closer together. People use Facebook to stay connected with friends and family, to discover what's going on in the world, and to share and express what matters to them.

(Facebook, 2019)

However, Facebook does not make money simply by allowing individuals to build community, as it is a free platform. They utilize community to capture the attention of Facebook users. In other words, the community and social connectedness is what keeps people coming back to the platform day after day (minute after minute). While attention is an important factor of the business model, that is not where Facebook makes money on advertisements. They make 98 % of their revenue through advertisements personalized to the individual's newsfeed (Cuofano, 2018). In my case, the more time I spend on the Facebook or Instagram platforms, the more I am worth to Facebook, as they charge advertisers for my attention.

As an experienced mindfulness practitioner, I felt I could apply some of the techniques I have practiced through a regular mindfulness practice and observe when I was being automatically drawn to my smartphone and social media apps. As the Lan et al., (2018) study suggests, mindfulness can be a useful intervention for individuals dealing with various technology addiction. While I do not know if my smartphone and social media use would be categorized as addiction, I do know that I was spending more time on these technologies than was productive. The first week of my experiment, I noticed hundreds of times throughout the day when I felt the urge to pick up my phone and scroll through Facebook and Instagram. There were another handful of times when I did not notice the urge but found myself automatically in the middle of zoning out on my social media apps. I realized that these behaviors had become habitual for me and based on the statistics from my iPhone, during the first week I had 123

“pickups” per day. While I was not engaging in social media every time I picked up my phone, I observed the vast majority of the time I was. This mindless and habitual behavior is exactly what Ellen Langer noticed in her research. She noticed the tendency for many daily tasks to be done mindlessly but, with a little effort, these same tasks could move to conscious behaviors (Rosenburg, 2004). Without my awareness, my attention was hijacked by my technologies more often than I would have liked and it would take conscious, intentional control to get it back.

After the first week, I recognized that in order to combat the attention economy, I was not only going to have to continue to be mindful, but I was going to have to put some guidelines in place to ensure that I was not continuing to automatically participate in this economy. In other words, I needed systems in order to take back my own attention. Since my experiment was focused on Facebook and Instagram, I felt the most appropriate intervention would be to simply delete those applications from my phone entirely.

This intervention was effective immediately, but the effects became more profound over time. In the second week of my experiment, my pickups were down 10% to an average of 111 per day. I would have predicted a larger decrease considering that most of my pickups were in order to utilize my social media apps and this was no longer an option. But this week I noticed many times that I was automatically picking up my phone to look at social media only to open my home screen and remember that I no longer had access to the applications. I also became aware that I was missing the time I spent looking at my social media. As my husband would continue to utilize these platforms, he mentioned a friend who had posted something thoughtful, a current event I had not heard about, or even a restaurant that had an interesting takeout menu for the week. I realized that I was missing out on some of the updates I was accustomed to.

The change in pickups became more significant over time. In week three, my pickups were down to an average of 93 per day and week four down again to 84 per day. It appeared that, after a few weeks, I was less compelled to use my smartphone as frequently. While I was still missing the updates the social media applications provided, I started to communicate with friends and family more outside of these channels. I found that I called my sister more instead of just seeing the photo updates of her kids. I asked my husband about current events instead of consuming and keeping them to myself, and asking led to interesting discussions we may otherwise not have had. I also realized that, instead of seeing a takeout menu online and ordering as a result, I could check in with myself to see what kind of food I was interested in eating that day. It seemed as if this experiment helped to make me more intentional and mindful, even though I was already a mindfulness practitioner.

My experience was not unlike the subjects in Levy's work. One participant, Nina, observed how the experience allowed her to reconnect with nature:

After I got to work, I was waiting for the crosswalk to turn white and reached into my pocket to find my phone again. I realized that my phone usually fills those small spaces in the day during which I am waiting to do something else. Because I couldn't play with my phone while waiting for the crosswalk, I looked up at the sky, which I realized I rarely do. This felt good. Normally I am so engaged with my phone that I don't even process my surroundings. Sometimes this even causes me to feel nauseous. It was refreshing to take in the city and smell the fresh air. (p.143)

While this may seem like a relatively small win, when we compound this change in behavior over days, weeks, and months, we realize the extent to which we are engaging more with life and our senses. There are so many compelling aspects about the technologies and devices within our

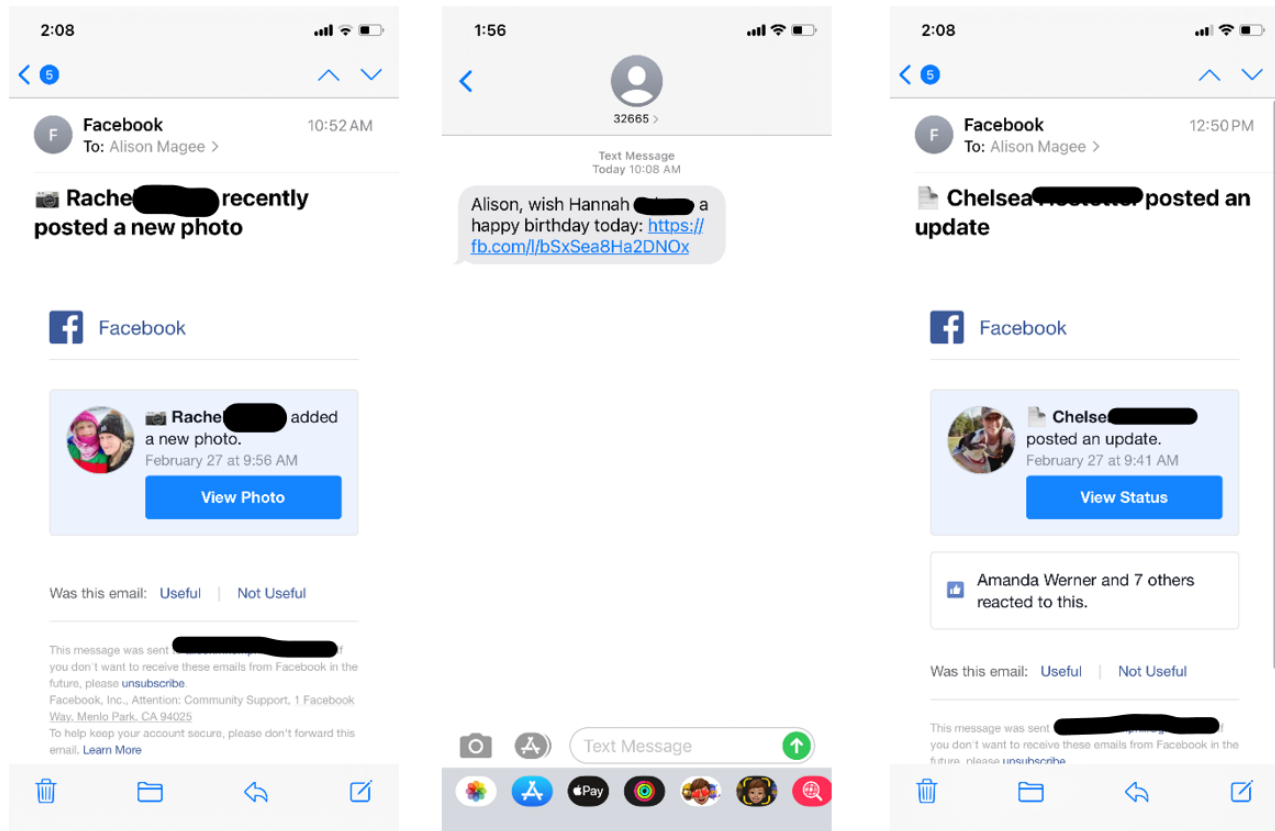
pockets but there appears to be a cost to living our lives compelled to engaging with a screen and allowing our attention to be taken by the economy that profits from it.

A major learning from this experiment was the concept of needing to be mindful of our actions before we can change our behavior. Studies suggest a consistent mindfulness practice can improve executive attention (Norris et al., 2018), cultivate the skill of awareness (Lutz et al., 2008) and help practitioners to become flexible and less automatic when responding to their environment (Sedlmeier, et al., 2012). The awareness was critical for this experiment as I never would have embarked on such an exercise if I did not realize the automaticity of my relationship to my smartphone and social media. My consistent, formal mindfulness practice likely contributed to my awareness. But, in my case, awareness was not enough. It took awareness coupled with an intentional effort to opt-out of the technologies I was compelled to engage with. Levy (2016) shares many other exercises in his book, and these can likely help with the change in behavior for an intentional relationship with technology. My experiment reminded me, I want to be a user of technology, I do not want it to use me.

Another interesting takeaway from this experiment were the tactics Facebook used to bring me back to the platform. As a result of my research for this paper, I knew that companies were using data to find ways to further capture the attention of their audience. I learned that, if a company noticed an individual was spending less time on their platform, they would try different tactics to bring them back. As Facebook recognized my lack of attention, they started to reach out. After not being on the platform for two days, I received an email, telling me that one of my friends posted a new photo and provided me with a link to bring me back to Facebook. Ever mindful, I did not click the link. I began to receive an email a day sharing updates from various friends who, likely based on the Facebook data, I would be likely to engage with. This tactic

went on for a week and much to my surprise, culminated in one day when I received two emails and a text message, all within three hours, sharing updates to get me back to the platform (see Figure 2).

Figure 2



Note. Examples of emails and text messages sent from Facebook to me during this experiment.

It felt like a last-ditch effort from Facebook to re-engage me and take my attention back. This felt like further confirmation to me that we need to be aware of the tactics of companies that are thriving within the attention economy and employ personal strategies to mitigate. It will take both intention and awareness, two skills that may be cultivated as a result of a regular mindfulness practice.

### **Direction for Further Study**

Whether we like it or not, we are all embarking on a big experiment as the global economy prioritizes capturing the attention of people all over the world. It is likely that, over time, we will have a better understanding of the impact this economy has and what types of products and services are created as a result. In the meantime, we should seek to understand how mindfulness and personal strategies may contribute to wellbeing and personal control. While the field of mindfulness research is growing, many studies to date are small or lack diversity in demographics. While the published results pointing to attentional outcomes are promising, many of the studies referenced in this paper include less than 100 and mostly Caucasian participants. The definition of mindfulness is not consistent throughout the literature that exists today so generalizing results becomes challenging. In order to further understand the relationship between the attention economy and mindfulness practices, a wide array of mindfulness practices, large and diverse cohort must be used.

Technology companies are growing in size and scale every day and their access to data and insights are growing exponentially. This results in companies that are becoming better at understanding human behavior and this information enables them to engineer products that capitalize on our attention. As the technology changes, the research needs to be developed. For example, the advent of social media was a major contributor to the attention economy and something the literature is starting to emerge on. As different technology becomes available to consumers and takes up the mindshare of its users, the literature should follow and show the impact. Much of the technology research referenced in this paper was done utilizing college students. While this is an important population to study as they are often early adopters of new technology, their experience may differ from other age groups and generations.

Another area for further study is the impact of specific mindfulness techniques and practices on the actual dollars contributed to the economy by the actions of the practitioner. While attention in the modern economy can be viewed as a type of currency, the literature shows that attention is also a mechanism for which money is acquired. For example, when a consumer decides to use the “free” subscription model for their Spotify account, Spotify is making money on the advertisements the individual is subjected to. It would be an interesting area of study to quantify those dollars that this individual is inadvertently contributing to the economy by way of their attention. This research could be important to the field because it could catalyze action. If I knew how much money I was contributing to the bottom line of Facebook or Instagram, I may think again about opening up that application on my smartphone.

### **Conclusion**

Most modern economists and ethical technologists agree that the negative effects of the modern attention economy are becoming one of the most important problems of our time. There is compelling evidence to suggest that the addictive nature of our technology, specifically smartphones, social media and the overwhelming information available to us at any given second, is contributing to humans’ struggle to pay attention, symptoms of depression and anxiety at growing rates, and belief in false information. This is a global problem, and one that will likely need to be addressed at a policy level in order to influence technology companies to evolve their business models. However, based on the research, I believe that individuals cannot and should not wait until the problem is addressed on a global scale. There are strategies one can utilize to reclaim control of their attention and combat the impact of the attention economy on a preventive basis.

Mindfulness practices have been shown to influence attentional control and stimulate the area of the brain responsible for executive processing and higher-level thinking and awareness. If the goal of the attention economy is to hijack attention and keep consumers in an addictive feedback loop without awareness, mindfulness can be viewed as the opposite. As Vidyarthi (2016) aptly states:

Meditators who train the skill of attention are well positioned to catalyze societal action.

As our awareness becomes more nuanced, we clearly see the battle of attention taking place in the modern world. (para. 17)

Research on the effects of mindfulness practice is relatively new and ongoing. Much of the literature to date is compelling but is limited in that mindfulness practice does not have a standard definition. While many researchers utilize the oft-quoted Kabat Zinn definition of mindfulness, there is not one way to operationalize the practice. This makes generalizations related to all mindfulness practice difficult.

Based on the tremendous concern of the downgrading of humanity via the attention economy and the addictive nature of technology, there is an opportunity for further study on how a mindfulness practice may serve as a personal mitigation strategy while we look to address the problem at a global level.



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