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The Effects of Meditation on Stress in High School Students

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Abstract

Young people today face many challenges including stress from social relationships, academic pressures at school, racism, social injustice, and the pandemic. This paper examines the efficacy of using practical and accessible meditation techniques to help decrease stress in high school students. Prior research on some of the causes of stress within this age group, including the history of mindfulness, the attention economy, incorporation of techniques into classroom curricula, and teaching meditation techniques to the high school age population, is explored. Further research on the benefits of teaching meditation to high school students, including a thorough examination of the complex barriers to students of color, is warranted. This paper presents a literature review and insights gleaned from primary research to demonstrate that meditation techniques are a viable intervention for high school students in managing their stress levels.

Table of Contents

The unprecedented last three and a half years in America and in the world have presented many challenges to all human beings across the globe. New challenges are rolling our way during these times of a worldwide pandemic, social injustice, climate chaos and political upheaval. Since the beginning of the pandemic it became increasingly evident that the new and unfamiliar stressors caused by this unknown and erratic virus impacted young people in negative ways (Jones et al., 2021). Suddenly, in addition to the familiar stressors of adolescence, students had to attend school from home and were often disconnected from their friends, social circles, supportive adult educators, and traditional school milestones and activities. Amid the evolving changes in the kinds and severity of stressors, young people, more than ever need accessible and practical interventions to support their wellbeing. One such intervention is mindfulness, which has been proven to reduce stress and improve overall quality of life (Wu et al., 2019). This paper explores some of the causes and conditions that lead to stress in teenagers. Then, it suggests that meditation may function as a supportive activity to help decrease their experience of it. This paper examines key areas of research on exploring teenage mental health in a pandemic, meditation in the classroom, the physiological and psychological effects of meditation, the attention economy, and racism and students of color. It concludes with a discussion of my teaching experiences, which illustrates an attempt to integrate mindfulness into the teaching of teenagers.

The Pandemic and Teen Mental Health

Researchers in a recent study entitled: *Impact of COVID-19 on Mental Health in Adolescents: A Systematic Review,* reviewed 16 studies which were conducted between the years 2019 and 2021, and included a total participation of 40,076 young people. These results showed that: “Globally, adolescents of varying backgrounds experience higher rates of anxiety, depression,

and stress due to the pandemic" (Jones et al., 2021, para 1). Further, the researchers highlight the point that in the adolescent population during COVID-19 the psychological toll taken on them may lead to a "severe and enduring impact on mental health, which leads to poor mental health outcomes and to poor physical outcomes, such as cardiovascular disease" (Jones et al., 2021, para. 3). This evidence is startling. As the pandemic has continued to persist, adapt, and evolve, sometimes wildly beyond the expectations of scientists and medical professionals, the widening gaps in mental and physical health supports for young people revealed by this crisis is a huge challenge for any country. It is particularly important to focus resources and attention on supporting young people who have existing mental health conditions because as the researchers point out, it is likely that the pandemic exacerbated these pre-existing conditions. The so-called negative outcomes, which are associated with underlying mental health issues may include suicide, emotional distress, and behavioral problems (Jones et al., 2021).

Similarly, the Centers for Disease Control reported in a recent study that "more than a third (37%) of high school students reported they experienced poor mental health during the COVID-19 pandemic, and 44% reported they persistently felt sad or hopeless during the past year" (Centers for Disease Control, [CDC], 2022). Here again, it is important to note that a previous study conducted by the CDC found that mental health was getting worse among students of high school age, even before the pandemic hit (CDC, 2019).

It is disturbing to note that no population has been left unharmed and unchallenged. Among two-thirds of lesbian, gay, and bisexual, students, and nearly half of all female students reported unrelenting feelings of hopelessness and sadness. In the lesbian gay and bisexual populations, it is estimated that these students are four times more likely to attempt suicide than their heterosexual peers. Among other student populations, research reveals that Black students are also more

likely to have attempted suicide than their young, non-Black peers (CDC, 2019).

As discussed in one study, though there is a two-pronged challenge of the high school aged population being understudied in comparison to elderly populations, and what may be a lack of existing "psychological capabilities of resilience and coping and the physiological development in adults," (Jones et al., 2021, para. 2) there are also bright spots. There is evidence to support that being exposed to and practicing more positive coping skills may lead to mental wellness in teenagers. Teenagers can also tap into being flexible and can sometimes easily adjust to rapid changes (Jones et al., 2021).

I know I am not alone in feeling stress on some level each day. As I have progressed through my graduate program throughout the pandemic, I've experienced a natural inclination to wonder how young people are feeling these days. Increasingly, my curiosity and sense of compassion led me to ask: "How are young people handling their stress and possible anxiety due to what is happening in the world?" "How are they coping?" "Could learning meditation techniques be helpful, practical and accessible to them?" In the face of these many stressful and stress-inducing conditions within our society, and with an eye to how young people may be impacted by them, it is valuable to examine some of the existing methods that schools utilize to help students. More specifically, what follows is a brief introduction and exploration of some of the origins of meditation and how these techniques were first incorporated into curricula and classrooms all across the country.

Meditation in the Classroom

In order to examine the use of meditation with school age individuals in academic settings it is helpful to look at its history and at how these practices came to be more accepted over time. Since about the mid-2000's in this country interest in mindfulness, and its sister offshoot,

mindfulness-based interventions, or MBI's, have continued to gain traction and have become increasingly accepted into mainstream society. It is however important to note that these developments have not been without controversy. Harry Hutchinson, the senior counsel, and director of policy for the Washington-based American Center for Law and Justice begs to differ with the current support for mindfulness being accessible to all students in public schools. Hutchinson believes that teaching mindfulness to children in schools is unconstitutional. He appears to see the existence of many successful meditation programs in schools as a threat to freedom in this country. He also supports other conservative groups who contend that mindfulness is based on Buddhism and is forced on young children (presumably along with Buddhist teachings) in school curricula. Hutchinson claims that mindfulness programs have "spread like wildfire" (Manson, 2019, para. 1-2) throughout the United States. In 2019, American Center for Law and Justice started a petition in opposition to such programs and collected 82,000 signatures (Manson, 2019). Candy Gunter Brown, professor of Religious Studies at Indiana University, has written several books about religion. She was pursued as a legal expert regarding cases on the constitutionality of mindfulness in public schools. She argues that incorporating mindfulness into public education may pave the way for a transformation of unintended consequences, including legal, fundamental, historic, and religious (Trafas, 2020). Specifically, Gunter Brown discusses in her book *Debating Yoga and Mindfulness in Public Schools: Reforming Secular Education or Re-Establishing Religion?* (Brown, 2019, as cited by Trafas, 2020) that many school mindfulness programs are "both secular and religious in purpose and effects" (Trafas, 2020, para. 5). Further, she presents as a paradox that school programs offer what she considers to be religious content in teaching activities such as mindfulness, yet they hide it under a secular framework, thereby

encouraging participation by those who are unwittingly participating in and being affected by an activity without fully understanding its religious origins (Trafas, 2020, para. 5).

One particularly adaptive aspect of meditation techniques within the scope of teaching mindfulness to children and teenagers is that in one respect, it may be viewed and understood as a teachable, active behavioral process. Meditation practices are also an appealing option within a therapeutic context. Far from being presented as an abstract construct it is a readily available and accessible activity. Because practicing mindfulness and meditation are activities which people "do" it can be viewed as a skillset and therefore readily learned like any other skill. (Renshaw & Cook, 2017, pp. 5-6).

Researchers, educators and indeed practitioners of various forms of meditation began to take note, as will be described in more detail below, of the positive results that clinicians and therapists were consistently observing in their patient populations within mental health settings. Eventually, this led to work by clinicians and researchers who began to pilot mindfulness-based interventions (MBI) studies on children and teenagers in the early 2000's. Further inquiry into MBI's and how they might positively promote well-being in youth, led the way to replicating previously validated mindfulness-based stress relief techniques which were then adapted to the school environment. The first study which investigated the effects of MBI's within a school setting was conducted by Napoli, Krech, and Holley in 2004. This study was conducted on students in Grades K through 3, and consisted of a controlled trial of mindfulness training sessions. Results from this landmark study indicated that in comparison to the passive control group, the intervention group exhibited moderate improvements on measures including social skills, test anxiety, and attention (Napoli et al., 2004, as cited by Renshaw & Cook, 2017).

Mindfulness and Meditation Defined

Mindfulness and meditation are interconnected yet they are also distinct from one another. Jon Kabat-Zinn, PhD, is the founder of the Center for Mindfulness (CFM) which began in the 1970's at UMass Memorial Medical Center. Here Kabat-Zinn opened a Stress Reduction clinic which has existed for 40 years. He further developed his work at the Center into the Mindfulness-Based Stress Reduction (MBSR) program and then the Center eventually moved to make its permanent home at the University of Massachusetts Chang Medical School (UMass Memorial Health, 2022). Kabat-Zinn's popular and well-regarded definition of mindfulness is awareness that "arises through paying attention, on purpose, and non-judgmentally" (Mindful, 2017, para. 1). Meditation on the other hand, may be defined as "learning to cultivate a calm mind." Meditation is the way one trains the mind to become quiet and peaceful (Buchanan, 2017, p. 72). More specifically, mindfulness involves the particular qualities of awareness and attention that one can practice and cultivate through the activity of meditation. Historically, within the core of Buddhist teachings for instance, mindfulness is considered to be the heart of Buddhist meditation (Thera, 1962, as cited in Kabat-Zinn, 2003). The practice of mindfulness involves not trying to attain a certain goal but to increase the mind's ability to live in the present moment and to observe and attend to, non-judgmentally, whatever thoughts and feelings may be arising during any given moment. Buddhist teachings are built upon the foundation that human suffering may be decreased through the practice of meditation, and that ultimately this practice helps to refine attention and action (Kabat-Zinn, 2003, p. 146). Gently attuning one's focus to observe how one is feeling in the present moment, viewing the self and all others non-judgmentally, and being open to what may unexpectedly arise, are all active, mental processes that would enhance any educational

environment. These positive, natural explorations are open to investigation and to the curious at heart. They are organically accessible to the open-minded student and educator alike.

Daniel Siegel, noted educator, psychiatrist, author and founding co-director of the Mindful Awareness Research Center at UCLA, likes to speak about the ways (the practice of) meditation may positively change and improve the quality of one's experience of their daily lives. Through the practice of meditation, Dr. Seigel speaks about increasing the sense of opening and expanding one's awareness through focusing on the present moment. "We can engage with ourselves and with others, making a more authentic connection, with more reflection and consideration" (Siegel, 2007, as cited in Buchanan, 2017, p. 71). Though in this article Seigel speaks specifically about the educators of very young children, his teachings may apply to all school aged populations. One crucial and overarching point focuses on the idea of intentionality. Here, Seigel presents the concept of a circular and mutually beneficial process for both teacher and student. Teaching teachers how to be more mindful, and aware of how they are feeling and experiencing themselves and their surroundings moment by moment, potentially increases their own sense of contentment and relaxation. Teachers who successfully make the experience of learning more meaningful for their students do so by imbuing their teaching process with their own mindful intentions and awareness. In the best scenario students notice and receive this organic transmission of their teacher's sense of calm which then fosters a positive and pleasant learning experience for them. In full circle teachers may also then connect with and reignite their own passion for teaching (Buchanan, 2017).

Seigel points to several key points to work with during one's practice of meditation, beginning with simply becoming more aware of the five senses of smell, seeing, feeling, hearing, and tasting. For instance this may include noticing the sound of birds singing, or the wind blowing

through the leaves and trees outside, or becoming aware of the wafting smell of coffee brewing in the morning. In another example, one may also begin to focus more clearly on how the tactile sense of a shirt's material touching the skin feels. Awareness of breath is used often in teaching beginners how to meditate, and one way to become more familiar with the sense of feeling, is to focus on the air temperature and the coolness or warmth of simply breathing in and exhaling out (Buchanan, 2017).

The use of meditation techniques as a way to help people feel less stressed and to respond more healthily to their daily challenges is no longer viewed as an activity which occurs only in small groups of people who inhabit the fringe areas of our society. Bolstered greatly by the existence of thousands of peer-reviewed research studies at this point, the scientific and medical fields are taking the use of meditation seriously. Meditation is being presented to a wide range of populations and in a variety of settings as a way to help more people feel and function better.

Physiological and Psychological Effects of Meditation

There are specific physiological components involved in the normal brain development patterns of the teenage brain and they warrant further exploration. During a radio interview in 2010, a parent and pediatric neurologist named Dr. Frances relates that she found herself startled by some of the behaviors of her two teenaged sons. One son for instance, made a drastic hair color change and began wearing black clothing with metal studs. She, "watched him morph into another being, and yet I knew deep down inside it was the same Andrew." Notably her son's grades took a sharp downward trajectory which was not consistent with his previous level of academic work. "Why is this happening?" she asked herself. Dr. Francis decided to think about the changes she was witnessing within the context of her work and what she knew to be true about the teenage brain and how it develops. When confronted with and somewhat confounded

by some of her sons' new behaviors she found herself asking of them, "What were you thinking? It's a resounding mantra of parents and teachers" (Your Health, 2010, para. 1-4). One of the things Dr. Jensen learned in her own research is that in the adolescent brain the frontal lobes are not fully connected. This leads to a more sluggish response to stimuli in certain situations. The reason for this lack of connection is because there is less insulation on teenage brain nerves. This important nerve insulation is similar to the insulation that covers electrical wire and helps with conducting electricity. The insulating substance in human brains is called myelin or "white matter" and it creates a kind of fatty coating on nerve cells. In teenagers, this layer of myelin is thinner and therefore information is not transmitted as quickly as it is in older adult brains. The frontal lobes are the part of the brain that asks "Is this a good idea? What is the consequence of this action?" Dr. Jensen continues: "It's not that they don't have a frontal lobe. And they can use it. But they're going to access it more slowly" (Your Health, 2010, para. 8-11). This fascinating scientific research and information about some of the ways in which the teenage brain develops and behaves easily lends itself to further study of meditation in teenagers.

Research studies conducted with healthy male college students from the University of Oregon and Dalian University in China suggest that short-term mindfulness training induced an increase in myelin, or white matter, in the brain. Specifically, scientists believe that increased myelination can occur during mindfulness training because this specific activity appears to increase neural firing. These changes to the brain pathways are significant because they impact and improve such behaviors as self-regulation and the ability to resolve conflict. It is conceivable that one potential outcome of the process of training the mind not only helps one to focus and slow down through the practice of meditation, but may also add new and neurologically desirable white matter in the brain (Tang et al., 2012).

Stress and the Relaxation Response

Another area of my interest in this work led me to research and learn about the negative effects of ongoing stress in adolescents. One significant study looked specifically at the high level of stress and anxiety "due to academic and societal pressures" at a public high school. Researchers evaluated the "feasibility (enrollment, participation, and acceptability) and potential effectiveness (changes in perceived stress, anxiety, self-esteem, health-promoting behaviors, and locus of control) (Foret et al., 2011, pp. 1-2) by using the Relaxation Response developed by Herb Benson at The Benson-Henry Institute for Mind Body Medicine (BHI) at Massachusetts General Hospital (MGH). This effective technique specifically works to address the fight-or-flight (stress) phenomenon that occurs as a "set of bodily changes that occur in response to stress" (Cannon, 1939, as cited in Foret et al., 2011, pp. 1-2). The administration of this public high school agreed to allow the researchers to conduct their study at the school due in part to several student suicides and other tragedies that had occurred within the student body two years prior to the study being implemented. This study used an intervention group where students were "introduced to and taught a curriculum which included didactic instruction, relaxation exercises, positive psychology, and cognitive restructuring" (Foret et al., 2011, p. 1). The study and its results are of particular interest as its use and analysis of therapeutic relaxation exercises with students intersects with my investigation into teaching meditation techniques to high school students for stress relief.

According to the researchers the use of the Benson Relaxation Response technique with students addresses some of the worrisome aspects brought on by stress, such as negative hormonal and physical changes that may occur under certain conditions. Working with exercises which trigger the Relaxation Response leads to many positive outcomes such as decrease in

oxygen consumption, blood pressure, heart, and respiratory rates. Also, the "elicitation of the Relaxation Response requires two components which include: the repetition of a word, sounds, prayer, thought phrase or muscular activity, and the passive return to the repetition when everyday thoughts intrude." This study's results were very positive for the intervention group, particularly for the girls in the group. The intervention group showed "significantly greater improvements in levels of perceived stress, state anxiety, and health-promoting behaviors when compared to the wait list control" (Foret et al., 2011, p. 2).

Another notable article which relates to physiological responses to stress is called *Stress Gets Under Your Skin*, written by Rafael Heller, about developmental psychologist Emma K. Adam. Dr. Adam conducted her recent research into how stress hormones, particularly cortisol, may impact learning and sleep in adolescents. Dr. Adam was specifically interested in measuring how closely aligned stress levels during the day were with the levels of cortisol that she measured in the students in the study (Heller & Adam, 2019, p. 33). According to Dr. Adam, the hormone cortisol plays a very important role in the regulation of attention, focus and sleep. Not at all surprisingly, the research revealed that students of color, particularly Black students, experienced ongoing and chronic levels of stress due to their experience of day-today discrimination (Heller & Adam, 2019). It is notable that even prior to the pandemic when this article was written (November 2019), Dr. Adam discovered that there was a good deal of emerging evidence, including from professional associations such as the American Psychological Association which found that over a time period of 8 to 10 years leading up to 2019, experiences of depression and stress levels within the adolescent population had significantly increased (Heller & Adam, 2019, p. 33).

It would be intriguing to see what kind of results Dr. Adam's study would yield in high school students who are living through the pandemic at this stage. Dr. Adam's research revealed what she described as a negative looping cycle, where a student first experiences stress, their cortisol levels rise, that hormone then interferes with sleep, which then causes fatigue during the day and then learning is impaired. The last leg of the loop finds a student frustrated and stressed about their learning being impaired and the cycle unfortunately begins all over again (Heller & Adam, 2019). On the subject of mindfulness and meditation Dr. Adam states that most of the studies have focused more on health outcomes and not on academic outcomes as her research does. Regarding meditation and its effects on academic outcomes, one of her recent studies looked at how meditating for a total of 30 minutes each day in school; 15 minutes at the start of the day, and 15 minutes in the afternoon. Dr. Adams noted that there were some positive changes in students' blood pressure, but that they hadn't seen effects on academic performance at that time (Heller & Adam, 2019).

In a related study, researchers examined the effect of meditation on social/emotional well-being in high school students who attended a high performing high school. The specific efficacy of one form of meditation called Transcendental Meditation (TM) was highlighted. This form helped to decrease feelings of depression, anger, fatigue, and anxiety while concurrently increasing a sense of self-esteem, happiness and notably resilience (Bleasdale et al., 2019). Similar to some of the positive physiological effects noted by Adams, Bleasdale et al., found that students who practiced TM experienced a change in brain functioning. Researchers point to a process initiated by the practice which causes an "automatic transition into restful alertness" which notably has been shown to "produce integrated and balanced brain functioning." Further, they discovered the additional and important outcome that TM appears to reduce the

overstimulation of the sympathetic nervous system which thereby leads to a decrease in psychological distress. Helping high school students to calm their minds not only increases their ability to focus but helps to enhance their "self-actualizing abilities" (Bleasdale et al., 2019, p. 3-4). Similar to the findings of the Relaxation Response study discussed earlier, it seems logical to conclude that supporting all high school students with this kind of robust meditation programming is beneficial to their mental, psychological, and physical health during these foundational years.

More studies on academic achievement when incorporating meditation into the school day are warranted. It is interesting to note that Dr. Adam referred to the use of meditation and mindfulness in schools as being "hot topics" in education, and she is almost dismissive about the idea of looking seriously at the benefits of meditation techniques as an important part of each student's day. Lowering blood pressure levels is an impressive result of the students meditating twice a day (Heller & Adam, E. K., 2019, p. 35)!

The Attention Economy

A thorough examination and analysis of the attributes of mindful experiences including the practice of meditation, would be lacking without an in-depth look at the role that communication devices play in most teenagers' lives. In a broad sense, the need for human beings to communicate with one another has played a crucial role in the development of our brains throughout evolution (Carbonell, Oberst, and Beranuy, 2013). One researcher (Arbib, 2018, as cited in Carbonell et al., 2013), supports the hypothesis that the early *homo sapien* brain may have been "language ready" even before there was language. In citing a separate study (by a different researcher) he presents the theory that there was little or no brain-related changes in the early *homo sapien* genome before and during the ensuing development of language-rich cultures

over of the course of tens of millennia (Arbib, 2018). It is fascinating to imagine that the brain may have developed during this period of human evolution to the degree that it was functionally capable of creating language and increasingly complex pathways to communicate only to lie dormant and wait for a more evolved human species to activate and utilize its full potential.

Enter the cellular telephone, or cell phone. The fusion of computing and telephony, first created back in the 1970's, has evolved all these many decades later into a potent and problematic "brew" (Carbonell, Oberst, and Beranuy, 2013). One key area which influences and permeates the day-to-day experience in most teenagers' lives is the use of social media specifically via access through their cell phones. It is important to examine further some of the inner workings of the communication network landscape and the ways in which it is designed to entice and impact its teenage users. As well, it is worthwhile to examine the opposite side of teenage cell phone and other device usage, which up to this point has perhaps not received enough attention or exploration. One study which examined the phenomenon of Phubbing or "phone snubbing," revealed thought-provoking and perhaps even surprising results (Karadaĝ et al., 2015, as cited by Rizkyanti et al., 2021, p 189). Phubbing is defined as choosing to pay more attention to one's cell phone than to interacting in real time with people who are nearby, and in-person. The plethora of research which has emerged in recent years tends to highlight the negative aspects of this behavior, and indeed that phubbing by its very nature is becoming integrated into societal norms and changing how human beings of all ages communicate and interact with one another (Rizkyanti et al., 2021). Interestingly, there were two sides revealed in this research data and this in itself is thought-provoking and worth further examination. Unsurprisingly, researchers described and discussed some of the negative aspects of phubbing such as cell phone obsession and obsessive behavior, which leads to the cyclical need and

craving for more online interaction over in-person communication (Chotpitayasunondh et al., 2018, as cited by Rizkyanti et al., 2021). Looking specifically at the human trait of empathy for instance, some contradictions are identified. Empathy is defined as an affective response which arises from the understanding of another's emotional state or condition, and how one who is viewing another might they themselves respond in the same situation or experience if their roles were reversed (Decety & Meyer, 2008).

Researchers also found results at the other, less negative end of the spectrum, which indicate that online activity does not reduce one's individual capacity for empathy in the real world. In fact, they argue their findings reveal that participating in an online environment produced a similar strong sense of social support as the experience of empathy in real time and in the real world (Carrier et al., 2015, as cited by Rizkyanti et al., 2021). New research on empathy and the experience of the COVID pandemic reveals that online social support, utilized through social media applications, actually provided a strengthened experience of support and sense of belonging to a community (Qin et al., 2022). Further, other studies noted that a "buffering effect" brought on by social support helped with the appraisal of stress during difficult life events, (Brock & Lawrence, 2010, as cited in Qin et al., 2022, p. 3), and that people who feel supported by others are less likely to perceive life's stressors as demanding or frustrating (Qin et al., 2022). Equally important, feeling supported during stressful conditions mitigated such maladaptive feelings as depression (Coffman, 2021, as cited in Qin et al., 2022) and anxiety as well (Gruenewald & Seeman, 2010, as cited in Qin et al., 2022). It is noteworthy that when people are experiencing such emotional states as anxiety and depression their ability to empathize with others is understandably diminished (Felson, 1992, as cited in Qin et al., 2022). The implications of these research findings are pertinent to understanding the far-reaching and presumably long-

term effects and consequences of the COVID pandemic on teenagers and people of all ages around the world, and further research is warranted. The current research on some of the potential positive effects of cell phone use by young people is still quite limited. More research on this subject needs to be undertaken so that users may have access to new information which may emerge. As it stands currently, research appears to support the existence of many negative aspects to repetitive cell phone use by teenagers, and this issue also requires ongoing investigation into ways to mitigate harm.

One powerful and pervasive piece of this modern communication puzzle revolves around how companies aggressively vie for human attention. The term "attention economy" is defined in one example as a business concept where rather than creating a product to be utilized by a customer in order to generate a profit, companies aggressively pursue the attention of the consumer/user to monetize. Attention is the product. This non-tangible, human experience product is then sold to other businesses and advertisers for profit. And crucially, businesses intentionally create their products to hook teenagers (and adults) in and to keep them engaged with and coming back often to their phones and other devices (Bhargava & Velasquez, 2020). How exactly do corporations accomplish this? Research into social media businesses such as FaceBook and Apple reveal that some of the technologies designed and employed by social media platforms are hugely influential, intentional, and far reaching. It is troubling but not surprising to learn that the applications for these platforms are not only specifically designed to become highly addictive to their end users, but they are also created by a relatively small group of engineers who are employed by a relatively small group of companies (Bhargava & Velasquez, 2020).

Further examining the underbelly of this vast framework, researchers note that it is young, predominantly male engineers who overwhelmingly live and work in the Bay Area of California and are responsible for churning out applications (Bhargava & Velasquez, 2020) which according to technology expert and designer Tristan Harris, "will shape the thoughts and feelings of a billion people" (Youtube, 2017, 0:27). The lack of diversity among this tiny representative pool of engineers and their life experiences, thoughts, and views alone is cause for concern. For instance, how might the content choices made by a young, white, 25-year-old male software engineer eventually influence an 11 or 12-year-old girl of color in some negative way? As we will see in the following examples, social media companies appear to have made continuous, damaging choices which negatively affect end users not only by limiting who creates the content of this impactful product, but by how they design them to be so highly addictive. Three effective and addictive mechanisms utilized in designing platforms may include a term called "intermittent variable rewards" (a design which works similarly to how slot machines in casinos reward customers) (Bhargava & Velasquez, 2020, p. 327). Secondly, designers may purposefully employ features which appeal to our need for a sense of social validation and reciprocity. Lastly, engineers often incorporate a design which wears down our own "natural stopping cues" (Bhargava & Velasquez, 2020, p. 327). How do these mechanisms and technical functions play out in real time? One example of how an intermittent variable reward is generated is found when a platform purposefully alters the frequency and magnitude of a particular reward. The concept of a "variable reinforcement" is utilized extremely effectively when a platform keeps someone on a site longer by doling out rewards in a very inconsistent manner. Keeping the frequency and size of these rewards coming inconsistently hooks users on a cognitive level. In evaluating one aspect of Twitter's functionality for instance, one researcher notes that the

platform intentionally slows down the speed it takes for a particular screen to load (Bhargava & Velasquez, 2020, p. 327). Purposefully delaying the loading time in this way creates an intermittent variable reward for the end user in a way that is likely imperceptible to them. The platform Pinterest takes a different tact. When a user scrolls down towards the bottom of their screen, some of the images on the page appear to be just out of view, cut off. For a user to appease their innate sense of curiosity they must then actively continue to scroll down further in the screen which subsequently keeps them on the site longer. Once more images load onto the screen and come clearly into view, a kind of endless search or hunt for rewards is established. It is easy to imagine how one might lose hours of their day once the pull of the variable reinforcement process takes hold (Bhargava & Velasquez, 2020).

In examining some of the addictive mechanisms that are designed and vigorously utilized by these platforms it is important to explore some of the potential negative impacts they may have on teenagers. One of the factors which play a role in getting teens so connected to using their phones is the enticement of gratification. “It is accepted that the more intense the positive reinforcement between consumption and physiological response, the greater the capacity of a substance to produce addiction” (Carbonell, Oberst, and Beranuy, 2013, p. 902). Feelings as intense as euphoria may be experienced when one feels (perhaps unconsciously) loved and valued via a cell phone communication, particularly in the form of a text message. It is also interesting to note that with the ever-increasing, seemingly endless supply of newer, novel cell phones that they in fact have now replaced many intimate and perhaps even beloved items such as the watch, the camera, the radio, the diary, and the calendar book (Carbonell, Oberst, and Beranuy, 2013, p. 902).

Bhargava and Velasquez's study helps to illuminate in part what may have been occurring in the behaviors I noticed in the students in my classes. During my internship in the fall at Massachusetts County High School, where I was shadowing my supervising teacher in her wellness classes, I had expected to see cell phone use by students in the combined classes comprised of sophomores, juniors, and seniors, and I did observe this behavior. In my return to the classroom last spring, I was aware that students seemed quite connected to their phones and some seemed to want to keep them nearby, or check them often. Once when we were watching a video, I suddenly noted the irony that while students were being shown an engaging 60 Minutes video on mindfulness and meditation, many were looking down at their phones, just as it was simultaneously being presented in the video that many people are distracted and are

often not present in the moment-to-moment-experience of their daily lives (Youtube, 2018). Clearly, teenagers are not the only population who may experience the pangs of cell phone addiction. Indeed, Anderson Cooper, the correspondent in the 60 Minutes piece, lamented during a group discussion at the beginning of a silent meditation retreat how much he missed his cell phone (Youtube, 2018). Often on silent retreats it is encouraged that retreatants turn in their cell phones for the duration of the retreat.

Default Mode

One specific area of interest for educators and researchers which falls within the framework of the Attention Economy is called the Default Mode, or DM. Default Mode is defined as a type of brain function that is induced during times of rest and unfocused but conscious states of awareness. The brain is capable of toggling between active thinking and a kind of daydreaming state which is induced during periods of wakeful restfulness and mental downtime. This brain state occurs within the Default Mode network within the brain. For

example, when someone is awake but not outwardly focused on a difficult task or an activity which requires concentration, they may then slip into a state of mind wandering. Contrary to the popular association that daydreaming connotes laziness, evidence from affective and neuroscience research suggests that when Default Mode systems are activated during certain resting states, important active mental processing is actually taking place. This may include such functions as "recalling personal memories, imagining the future, and feeling social emotions with moral connotations" (Immordino-Yang et al., 2012, pp. 352-3). Educators would benefit by exploring and utilizing existing research on Default Mode as it specifically intersects with various relaxing mental states brought on by meditating. Introducing students to meditation practices and teaching them how to experientially increase their self-awareness of certain mind states may lead to decreased levels of stress and anxiety**.** In fact, there are numerous experiential educational programs which focus on the importance of quiet time and time for introspection, and teaching mindfulness practices and activities as a pathway to those mind states may be quite beneficial to students (Cohen, 2006, as cited in Immordino-Yang et al., 2012).

The researchers in this study cite findings that indicate a state they call "Looking In" and they describe some of its positive attributes (Immordino-Yang et al., 2012, p. 357). In one example of this process they describe an interview with a college age male in who takes part in a "one-on-one social emotion-induction interview" (Immordino-Yang et al., 2012, p. 357). In this interview process, the interviewee listens to a story and watches a video about a young Chinese boy who grew up in an economic depression. His father had died soon after his birth and his mother worked long hours as a laborer.

One day in the winter the mother found a coin on the ground and bought some warm cakes with it. She offered them to her son (who had been at school all day with no food to eat),

and he in turn offered his mother the last cake, even though he was still hungry. The story ends with the mother saying she had eaten previously, even though she had not. She gives the last warm cake to the little boy.

Of note in this interview is something that is reported by the interviewer about the young man in the interview. After initially sharing that he felt touched emotionally by the story, and that he experienced the physical sensation of something "like a balloon under my sternum," he eventually paused for a period of time and sat still in silence. He "appeared to briefly withdraw from the interaction with the interviewer and stare blankly into his lap. He then emerged from this stillness with a report of having spontaneously evaluated his own relationship with his parents" (Immordino-Yang et al, 2012, p. 357). This pause, and time of stillness is presented in the study as being connected to a state of Default Mode and in this case provides a spontaneous opening for the young man to be self-reflective and to perhaps become more self-aware. "By evaluating the emotional implications of another boy's situation, John learned to better appreciate his own" (Immordino-Yang et al, 2012, p. 357). The researchers present the idea that in contrast to how mind wandering might be viewed as something negative and even wasteful (of time), this evidence reveals some of the positive attributes of being in the Default Mode state.

Changing Behaviors

One area of teenage development has shifted dramatically according to one researcher and professor of psychology. This includes a distinct shift in teenage behavior away from the goal of increasing independence from their parents. In stark contrast to teenagers she has researched for over 25 years, Dr. Jean M. Twenge has named the youth she studies, "iGen" (born between 1995 and 2012), and notes that they have been "shaped by the smartphone and the concomitant rise of social media" (Twenge, 2017, p. 4). Around the year 2012, Twenge noticed

what she defines as an abrupt shift in teen behaviors and emotional states, noting that many of the "distinctive characteristics" (Twenge, 2017, pp. 3) of the Millennials who came before the iGens simply began to disappear from her data. Twenge notes that she was very familiar with finding results which showed both Baby Boomers and Millennials alike as being individualistic, noting that the Millennials are markedly so (Twenge, 2017, pp. 3-4). Surprisingly, her research indicates that this younger generation seems far less interested in pursuing and increasing their independence from their parents.

Equally compelling, a study on social media as a potential cause for depression symptoms presents the term passive social media use, of PSMU. In describing the behavior of scrolling endlessly through photographs of friends, or news feeds they cite experimental research which has shown that PSMU appears to negatively impact several important touchpoints of well-being, including life satisfaction, sense of belonging and affective well-being (Aalbers et al., 2019). Similarly, Dr. Emma K. Adam notes that the use of cell phones for up to 4-5 hours each day has also been found to be associated with depressive symptoms in teenagers. While it is easy to see why students so often use their cell phones as a main "source of social support and cohesion", which is clearly a positive result of this kind of communication, some of these behaviors may become problematic when usage displaces real and personal face-to-face interactions (Heller & Adam, 2019, p. 34).

Dr. Adam additionally points to the problem of social exclusion amongst teens as another negative aspect of excessive cell phone use. Importantly, though in Adam's research teens report that the stress caused by the pressure to succeed academically ranks as the number one cause of stress, the number two cause is social stress. Critically, though social stress appears in the second place slot, it has the greater emotional impact on teens as it is most closely linked to feelings of

depression and anxiety (Heller & Adam, 2019). Finally, in referring back to the Twenge article, she notes that in all of her research experience, some dating as far back as the 1930's, she had never seen such a drastic change in teenage behavior within a particular generation of teenagers. What was happening in and around 2012? It is not surprising that this was the time period when the proportion of Americans who owned a cell phone jumped up to 50%. Additionally, by the year 2017 5,000 American teenagers who were surveyed revealed that as many as three out of four of them owned an iPhone (Twenge, 2017, p. 3-4).

Racism, Students of Color and Meditation

With the murder of George Floyd by Minneapolis police officers on May 25, 2020, the awareness of systemic racism by Americans who are not People of Color seemed to increase substantially. With the horror of each successive death both before and after Mr. Floyd's death, due to either being pursued by or in the custody of police, the ceiling of denial and non-awareness was cracked open. The nation and the world at last seemed to be beginning to comprehend the enormity of persistent and systemic racism and violence which takes place in the United States every day. Many Americans of color have died and continue to die under similar circumstances. The existence of systemic racism and violence in this country cannot be overstated when examining any aspect of education for high school students of color and indeed all teenage students. It is important for all educators to increase their awareness about, according to plentiful research studies, the stressful load each Person of Color carries in dealing with daily slights, inequities and far worse. Young African American males in particular, and their families who care for them, bear the daily burden of wondering if they will cross paths with a police officer or officers in some quicky escalating scenario, and if they will make it back home again at the end of the day. In Breonna Taylor's tragic case, the fact that she was a young and vibrant

woman of color did not protect her from joining the many young men before her who also died at the hands of police wielding guns.

Data on this subject described in the book *The Many Costs of Racism* (Feagin & McKinney, 2003) states that most non-Black and white Americans simply continue to deny the very existence of everyday racism. They deny the emotional, economic, psychological, and physical health impact and costs of racism and the pervasive toll it takes on all African Americans in the form of far-reaching anti-Black attitudes and discriminatory practices (Feagin & McKinney, 2003, p. 10). In a previous study Feagin (Feagin & Sikes, 1994, as cited in Feagin & McKinney, 2003) quotes one African American successful entrepreneur's response to the question, "What is it like to be a Black person in white America today?" Her response? "One step from suicide! What I'm saying is--the psychological warfare games that we have to play every day to survive…We learn the rules of the games, and by the time we have mastered them…then they change the rules of the game." While the woman who was interviewed was not seriously considering suicide, her response is understandably full of anger, awareness, pain, and frustration. Her response pulls back the cover to expose the relentless effort, including psychologically, emotionally, mentally, and physical, to engage in a kind of "psychological warfare" in her work in the business world whose rules of engagement are created and sustained by white people (Feagin & McKinney, 2003, p. 6).

During my research into examining how the practice of meditation might be helpful to high school students, it became clear to me that a candid exploration of systemic racism and how it affects young students of color is imperative. For instance in student teaching high school students over the previous year, I quickly noticed that though there were many students of color in the population of about 1,200 students, I rarely saw African American students taking

advantage of the wellness classes that I was shadowing. Anecdotally, I noticed that there were Asian American students, Middle Eastern students, South Asian American students, and Latinx students represented in our classes. This troubling situation bears further attention. The lack of participation by African American students in the many mindfulness and meditation classes readily available to them warrants further exploration by the high school. It is conceivable that many African American students simply do not have access from a young age to mindfulness concepts and activities. A lack of familiarity and comfort level with these mindfulness school offerings available in their teen years may therefore not be very appealing. This is a critical issue which should be addressed more openly and candidly by school administrators, teachers, students, and parents. Identifying and exposing racist and biased behavior in everyday circumstances is essential for educators who want to better understand what teenage students of color are forced to contend with in their day to day lives. Understanding the pernicious and sometimes relentless nature of racism in our society -- and what toll it takes on all students of color -- is necessary for anyone who wants to support and educate high school students. Ongoing and open discussions between teachers, students and administrators about uncomfortable topics, experiences, and feelings about them is essential. On a positive note, in my experiences in the classroom over two quarters, some students seemed comfortable and familiar with talking about uncomfortable topics such as stress and how it negatively affects them in daily life. They were self-aware, thoughtful, and had the ability to look at complex issues with a nuanced view.

High school students could benefit by being introduced to some basic theories on biased or racist behaviors and how to better identify them. One cogent and useful paradigm for racism categorizes racist behavior and how it is harmful into three distinct areas. One is defined as a racial microaggression, or daily and brief environmental indignities which communicate

derogatory and hostile insults toward all people of color. The term microaggression is believed to have first been coined by Harvard University educator, Chester M. Pierce, who referred to the term as: “subtle, stunning, often automatic, and non-verbal exchanges, which are put downs” (Sue et al., 2007, p. 273-274).

A second and third category of biased and racist behavior are Microinvalidations and Microassaults. Microinvalidations are described as types of communications that “exclude, negate, or nullify the psychological thoughts, feelings or experiential reality of a person of color.” A Microassault is categorized by intentional verbal or nonverbal attack which is meant to hurt a victim through name-calling and purposefully discriminatory actions (Sue et al., 2007, p. 274). In-school trainings and workshops for all students on how racism is present in the daily lives of all students of color is essential to beginning to support students every day. Having an open and ongoing forum to bring racism and biased behavior to the surface is essential if high schools are to become optimally inclusive.

In a separate study, researchers examined the inequality, potential differences in a range academic and other areas of support in high school, and the perceptions of Back and White high school students of these differences (Bottiani, et al., 2016). One primary focus was to analyze how both Black students and White students perceived the support from their school in the form of strong relationships with helpful adults for instance. Research suggests that engaged and supportive relationships between students and adults may be a predictor of future social-emotional well-being, and the connection by students to their academic work. Overall, students’ awareness and perceptions of being treated differently than other students, seems to impact poor outcomes particularly for students of color (Bottiani et al., 2016). Specifically, these perceptions of discrimination have been connected to antisocial behavior, (Bogart et al., 2013, as cited by

Bottiani et al., 2016) low self-esteem, and depression (Zeiders et al., 2012 as cited by Bottiani et al., 2016).

In equally disturbing findings, Black students' perceptions include expecting to interact with people who treat them negatively and to face discriminatory situations during each day of their lives. Dr. Adam notes that in diaries and questionnaires Black students are much more likely "to describe themselves as walking around in a perpetual state of hypervigilance, and to constantly be expecting to be the subject of a microaggressions and explicit threats." Again, there is the emergence of a cycle where the emotional wear and tear and fear of threat with "just going through the day" and facing both real and anticipated threats will manifest itself in heightened cortisol levels (Heller & Adam, 2019, p. 34). Dr. Adam found that Black students conversely had higher levels of cortisol at night and overall, that the pattern tended to be "flatter, suggesting chronic stress that never let up" (Heller & Adam, 2019, p. 34). To add further injury to this cycle from a physiological perspective, upon waking in the morning, Black students were not getting an important jump start from a surge of cortisol which helps one to feel wakeful in the morning. Interestingly, in this context, a tiny shot of cortisol in the system each morning is a very good thing!

To help negate these troubling results present for students of color, it is possible that incorporating more mindfulness training and meditation techniques could be helpful in counteracting the high levels of cortisol found in students' systems. Teaching meditation to high school students is beneficial to them as it decreases their experience of stress and anxiety, yet evidence points to a gap in resources which examine the problem of systemic racism. The experience of daily racism and bias in educational settings is building a wall against students of

color who perhaps do not feel free to explore and learn about the many valuable aspects of mindfulness and mediation techniques.

Dr. Adam presents four of the most critical areas of her work that she would like to share with all teachers, school administrators and principals if she could. The first is to acknowledge and respect how much students' in-school performance is so heavily influenced by whatever is going on outside of the school. They carry real burdens with them everywhere. The second is how important it is to not underestimate the effects of racial stress and social exclusion. Social stressors have very powerful influences on adolescents' attention, emotional health, and mood. This is especially true for students of color who are essentially going through each day with their cortisol levels on simmer, and needing to be constantly on alert for any signs of discrimination, microaggressions and other threats (Heller & Adam, 2019). The third is to recognize and understand that the stress of test-taking has significant effects on scores, and this is particularly true for students who are already walking around with high levels of stress. Acknowledging the existence and impact of these three crucial factors in combination with supportive research findings should give any educator, parent, and administrator pause. Test scores do not appear to be an accurate measure of a student's knowledge and achievement. The fourth area identified includes the need for administrators and educators to acknowledge how vitally important it is to take responsibility for student mental, psychological, and physical health. They need to understand the serious ramifications of stress in teens and how important it is to provide consistent and intentional support to them whenever they begin to show signs of struggling (Heller & Adam, 2019).

Emphasizing the need to take adolescent student stress very seriously, to notice when they are struggling, and then to help them is crucial. Interestingly, Adam notes that more and

more schools are seriously investing in onsite health clinics. Some schools have even begun to require that all students be screened for depression and anxiety. While this is a crucial step towards supporting student wellness, it is still critical that researchers gather much more data on what is really going on with students. Students need a sustained investment and effort to help all of them manage and reduce the amount of stress in their daily lives (Heller & Adam, 2019).

My Teaching Experience

In spring of 2021, I began to search for a high school where I could create my internship for the Mindfulness Studies graduate program at Lesley University. After some research and investigation I approached Massachusetts County High School located in eastern Massachusetts where I met for the first time with a teacher named Amata Roland. At the request of the principal of the school, the name of the high school and Amata Roland's name are both pseudonyms. As soon as I met Amata, I was sure that I wanted to work with her. I remember she brought in a huge binder to our meeting, full of the syllabi of all the courses that are offered there. It was very impressive. Amata talked about the kinds of classes in their curriculum and one that she singled out is called "Brain Train." In this course she incorporates stress relief techniques and activities as well as teaching mindfulness in the form of leading different types of meditation sessions.

I was surprised to discover that Massachusetts County High School has a rich and deeply rooted wellness department history. The high school chose over time to slowly transition away from identifying itself as a physical education department and has since grown into a comprehensive and full range physical and emotional health department. Courses include a rigorous outdoor and indoor climbing course; with activities such as being winched up to close to the gym high ceiling and released (in full protective gear of course) to swing widely back and forth into what is called "The Flying Squirrel." Sexual education and health courses, yoga and

the “Brain Train” course are among many others offered at the school. I was fortunate enough to work closely with Amata as my teacher and mentor for both the fall quarter of 2021 and again in the spring of 2022 when I was successful in persuading her to let me return in order to shadow her for five of her Brain Train courses. I was thrilled. Amata’s Brain Train courses include videos on meditation, with mindfulness leader Jon Kabat-Zinn, the neuroscience of the brain, including a video of Robert Sapolsky, neuroendocrinology researcher, author, and Stanford University professor. I shared with Amata a few times that I thought her class was more like a college level course than a high school level one! I also shared with the students several times over the course of the first quarter, how incredibly fortunate they were to have these types of emotional, physical, and psychologically supportive wellness courses available to them. Working closely with Amata gave me an extraordinarily valuable learning experience and insights which will last for my lifetime.

When I first started to intern with Amata in her classes I was absorbing so much new information each day. This was a unique and memorable period at this time in my life, due in part to the fact that by the fall of 2021, at the beginning of my internship with Amata, I had been working at home full time for well over a year due to the pandemic. Though I lead a fairly active lifestyle with walking and biking regularly, the shift to leaving my apartment and to working (and walking around) in a huge high school of nearly 1,100 students, and staying up on my feet for hours at a time was a quite a change of pace. In addition to striving to be a good student in learning Amata’s lessons right along with all of her students, focusing on being alert and ready to assist her during different sections of her different classes, observing, taking detailed notes, checking in with myself to observe what I was feeling and if I was responding well to students and focusing on being mindful with all of the new content was sometimes exhausting. Returning

home most days, I remember I was lucky if I could take care of a few errands, or housework before collapsing into bed. It was also exhilarating and fun and I knew I was in the perfect place! On most days I couldn't think of anything I would rather be doing or who I would rather be with, and this is a special circumstance to find oneself in.

All of my work and studying for years in my graduate program was paying off. I would sometimes spontaneously step outside of myself momentarily to observe what I was thinking and doing, and it all felt so natural. Importantly, I felt that my education, particularly the focus in the curriculum to study traditional Buddhist teachings had prepared me well. I understood in those first few weeks how vitally important it is to study the foundation of Buddhist teachings, even though I was asked not to mention these teachings in the classroom, and to understand on a deep level, where and how mindfulness and meditation were born. This foundation is what makes me an effective and compassionate teacher. I felt the support of these teachings beneath me as I took my first and unfamiliar steps out into the classroom to share with many willing, curious, and accepting students. It was deeply moving for me when it came time to teach meditation to Amata's students, because I innately felt a spontaneous reverence towards and appreciation of both what I was teaching and who I was teaching.

As powerful as these positive experiences were, it is important for me to examine some of the less uplifting moments which were experienced. It is humbling to note that some of the deepest lessons learned involved coming face-to-face with the less positive aspects of my personality including when I experienced my own biases in real time and felt myself become judgmental of some of the students I was working with. Intriguingly, I have noted often that these were in fact some of the best learning experiences during that entire year. In one instance, I was passing out meditation surveys to the students in every class. In nearly all of Amata's classes

there were one to two students who were other abled, and they often had a wonderful teacher assistant to help guide them through each class by answering questions and offering support during different assignments and activities.

On one particular day, one of teacher assistants was not in class with one of the students who I had shared some brief interactions with from time to time. Here I will call him Nathan, which is not his real name. Nathan was nearly non-verbal, and as his teacher assistant had informed me, also a very talented pianist. I had noticed my own level of discomfort with trying to connect with Nathan previously, I think mostly because I felt uneasy that he didn't speak to me or look at me when I would speak to him. As I was passing out the 20-question survey I walked up to him and instantly made the calculation that he would not be able to fill out the survey alone, which I suddenly deemed to be fairly complex in nature. As it happened, fortunately, Amata was walking nearby as she often circled the large classroom space during class. She immediately saw that I seemed to be passing Nathan by for some unknown reason, and she simply made eye contact with me and said, "Give him one too." I immediately nodded and felt badly that I was preparing to completely leave him out of this exercise which was in fact part of an important project I was doing. "Wow." I thought to myself instantaneously. "What was that all about?" I caught little glimpses of Nathan as I too continued to walk around the classroom looking for students who were completing their surveys one-by-one, as I was collecting them. I noted that Nathan carefully, thoroughly (and very neatly) completed the entire survey with efficiency. At that point I felt a bit ashamed of myself and my completely inaccurate and inappropriate assumptions about Nathan. However, fortunately, as was often the case in the Brain Train classes, I was in a fairly meditative state; open, observant, and receptive, and I was able to observe the entire scenario with some neutrality too, as if I had just watched a little

section of a movie. I was able to see how very quickly my eyes and mind had surveyed the classroom and students, came upon Nathan, made a judgement, (in an instant!), started to act on it, was corrected, understood the reason for the correction, made the course correction, and moved on from it.

Another lasting lesson came in the form of awareness of my being judgmental in my thoughts of some of the students and of what I sometimes observed in their behavior. Teenagers are intriguing people. Sometimes in the classroom I noticed them being quiet and internally focused and other times they would boisterously and spontaneously jump around and laugh out loud. I realized over time that they seemed unfamiliar to me, as if I couldn't quite understand how they were perceiving the class and activities we were doing. I often didn't know how they were perceiving me. I noticed how quiet many students sometimes were when Amata asked the whole class questions when we sat together as a group. Sometimes there was a good deal of quiet space during group discussions and classroom activities and that occasionally made me uncomfortable. Sometimes, no one would answer a question, (I often found questions from Amata to be stimulating and interesting, because her material was so stimulating!) and that is when I found myself becoming judgmental of them.

It was very helpful during these instances for me to talk with Amata after class about what I observed and to hear her thoughts and experiences gleaned from her many, many years as a teacher. Over time I also became aware of the very defined guidelines of the high school. There were many things that were not acceptable to bring up in the classroom, and appropriately, I quickly learned to ask Amata about everything first. For instance, as I mentioned earlier, I couldn't mention any ideas or teachings found in Buddhism, other than to say briefly that the Buddha lived over 2,600 years ago, taught meditation, and that the practice of yoga was designed

to help practitioners to sit in meditation more comfortably. I bristled from time to time in feeling constricted by how I should act and present myself to students, but again, I think most of that has to do with my being judgmental. My increased awareness of my biases is an important learning experience and I plan to continue to check in with other teachers for support and to keep track of it. I imagine this might take the form of regular conversations, supervision, and having others observe my future classes.

During my internship and when I returned again to the classroom in the spring of 2021, I was fortunate to be given permission by the principal and Amata to conduct a course assessment in the form of surveys for her students. I administered these surveys to each of Amata's five classes both before students were introduced to the sections on mindfulness and meditation and afterwards. The meditation sessions that I led were comprised of Guided Imagery meditations and lasted for approximately 20 minutes each. I led approximately two sessions per week for each class, for approximately three to four weeks. The survey I chose to use is called the Philadelphia Mindfulness Scale (PHLMS) and was designed by researchers who did not include it in their study (Cardaciotto, et al 2008). Their survey may be found on a website called Meditation Research. Dr. Peter Malinowski is the Founder and Chief Editor of the Meditation Research website, Co-Director of the Research Centre in Brain and Behavior at Liverpool John Moores University, UK, and Director of a Meditation Research Lab. His membership website provides current and past research on meditation and other resources. The interactive areas presented on the site are divided into the following categories: Compassion, Interventions, Meditation, Mindfulness, Neuroscience, News, Physiology, Psychology, Research Methods, and Research Roundup (Meditation Research). I was attracted to the survey from this resource because I liked the way it was designed. It is comprehensive and detailed, yet it is fairly straight

forward and easy to take. The 20-question survey "measures the core constructs of mindfulness as defined by researcher Scott R. Bishop" (Bishop et al., 2004 as cited by Meditation Research), together with many researchers in their 2004 journal paper entitled: Mindfulness: A proposed operational definition. The two-component definition involves:

> The self-regulation of attention so that it is maintained on immediate experience, thereby allowing for increased recognition of mental events in the present moment. The second component involves adopting a particular orientation toward one's experiences in the present moment, an orientation that is characterized by curiosity, openness, and acceptance. (Meditation Research)

The following information on the survey data I collected is shared here anecdotally only, as I collected this information as a course assessment rather than a formally-designed research project. Although the results of these assessments may not be widely generalizable, they do give an interesting window into the mindfulness experiences of one group of teenagers. I administered surveys to a total of five classes, first at the beginning of the quarter, before they participated in meditation sessions, and then towards the end of the quarter after meditation sessions. The survey looked at levels of awareness, via ten questions posed, and then acceptance, via ten questions posed. Some of the questions in the awareness and acceptance sections included:

- I am aware of what thoughts are passing through my mind.
- When talking with other people, I am aware of their facial and body expressions.
- When I walk outside, I am aware of smells or how the air feels against my face.
- When someone asks how I am feeling, I can identify my emotions easily.
- I try to distract myself when I feel unpleasant emotions.
- I try to stay busy to keep thoughts and feelings from coming to mind.

- I tell myself that I shouldn't have certain thoughts.
- When I have a bad memory, I try to distract myself to make it go away. (Meditation Research).

In the pre-meditation classes I received surveys from three classes of 17 students, one class of 24 students and one class of 23 students. For the post-meditation surveys I received two classes of 20 students, one class of 22 students, one class of 19 students, and one class of 17 students. The total average for each class for the awareness questions in the pre- and post-meditation surveys were:

Pre-meditation Awareness		Post-meditation Awareness
Class 1	33.75/50	35.75/50
Class 2	36/50	32.50/50
Class 3	33/50	33.50/50
Class 4	35/50	33.75/50
Class 5	36.25/50	34.75/50
Pre-meditation Acceptance		Post-meditation Acceptance
Class 1	24.75/50	27/50
Class 2	23.50/50	27.75/50
Class 3	25.50/50	28.75/50
Class 4	26.25/50	26/50
Class 5	26.25/50	27.25/50

The survey states that the results numbers fall within a range of between 10-50 points, with lower numbers indicating lower levels of awareness and acceptance, and higher numbers closer to 50 indicating a higher level of these qualities (Meditation Research). The results for

both the pre- and post-meditation surveys indicate that the students experienced a higher sense of awareness when compared with their sense of acceptance. The post-meditation surveys show either similar numbers or a slight decrease in awareness with a range between a pre-meditation result of 33.75 to a post-meditation result of 35.75 and a pre-meditation result of 36 to a post-meditation result of 32.50 which situates the results solidly in the high-middle range. There was a very slight increase within the range between a pre-meditation result of 23.50 to a post-meditation result of 27.75 and a pre-meditation result of 26.25 to a post-meditation result of 27.25 in acceptance in the post-meditation surveys. Overall, the acceptance results for both pre- and post-meditation land squarely in the middle of the survey range. The higher level of sense of awareness in students is a positive sign. As noted previously in Dr. Seigel's work, one's ability to increase through the practice of meditation their awareness of touch, smell, scent, hearing, and observation, will lead to a sense of connection to others and the ability to access a deeper experience of relaxation and calm (Siegel, 2007, as cited in Buchanan, 2017, p. 71). The fact that students seemed to be able to effectively focus on a kinesthetic sense of themselves and the environment around them indicates that they have the ability to toggle between their busy cell phone engagement and a very different kind of intentional experience. These results on awareness are encouraging. The lower survey numbers in the area of acceptance seem to show that students would certainly benefit from ongoing and robust support from their high school teachers, staff members and other caring adults. Exposing students to the concept of kindness and compassion to self and others, as taught in many types of meditation practices, across the entirety of their high school experience may increase levels of acceptance. A more intensive and sustained implementation of mindfulness than the constraints of my study could allow for seems promising

for the population of high school students given the pre- and post-meditation survey results on acceptance and awareness.

How are teenagers doing right now? They need our help. They will continue to need foundational support to help them deal with issues such as stress in an increasingly stressful world. From my experiences over many months with dozens of teenagers, I have learned how extraordinarily resilient, flexible, open-minded, and adaptable they are and that is hopeful.

Discussion

Teenagers will benefit by having supportive adults surround them and introduce them to such accessible and therapeutic activities as meditation. Students understand the importance of accessing this kind of healthful experience as it supports them in feeling and functioning better in a stressful world. The guided imagery meditation sessions I led students through were given over the course of several weeks. In addition to my sessions, students were also introduced to other forms of meditation via materials or brief in-class experiences for a class or two which were led by Amata Roland, my supervising teacher. Some of these different types of meditations included mantra/word or phrase meditations, open eye/gazing meditations, breath meditations, sound/music meditations, and mindful moving meditations. The guided imagery meditations I led included a body scan, a starry sky relaxation meditation, an ocean wave meditation, and a river stone meditation. Over time, Amata and I developed a wonderful way to connect my 20–30-minute meditations to accompanying sounds and visual additions, and this created an immersive experience for the students. For the starry sky meditation we darkened the room and strung small, bright twinkling lights around the projector table, and they reflected off of the floor-to-ceiling mirrors on one side of the room. For the river stones meditation I found audio of a gurgling brook which we played for the entirety of the meditation. What this process

accomplished through meditation was helping students to focus on themselves, listen to their heart rate, notice the pace and depth of their breathing, connect peripherally to other students lying around them on the floor, notice the thoughts that were appearing in their minds and passing by, the environment in the room, and feeling the cool or warm air from the huge vents far up above swirling down softly past the skin on their faces.

All of these experiences helped students feel calm and relaxed. In some instances, this sense of relaxation can accompany the meditator for hours after the initial meditation session (Roth, 2018). Though at first glance the survey results may show a modest impact by the meditation sessions, my experience on the ground indicates otherwise. The numerous positive results elicited by meditating can be subtle and time is a friend to the experiential process. This is what I observed over and over again with the dozens and dozens of students I observed over several weeks. As the weeks progressed, I watched exuberant, sometimes excited, bouncing, energetic students begin to be able to settle into complete silence and stillness for nearly 30 minutes. This was a success!

Lastly, perhaps symbolic of the experience of other students in my classes, I will share a parting exchange I had with one student. When this student started the quarter they were one of most outgoing in the class. Slowly over time, I learned that a parent of this student was ill and was undergoing treatment. Sadly, I began to observe the student becoming quieter and quieter and withdrawn over time. In the last class in each of the classes, in honor of the smooth river rocks I spoke about in that meditation, I gave out polished black stones wrapped in paper and twine. I told each class I was grateful to them for all I had learned as they so willingly joined me on our meditation adventures together. Each student was able to pick their own stone out of a basket as I thanked every participant while I slowly walked around the room. The room always

became very quiet during this process. When I reached the student with the ill parent, they picked out one stone and thanked me. Before returning to their seat, they turned around suddenly and asked shyly if they could take a stone for their ill parent, and then for everyone in their family. It was as if the stones were imbued with something special and healing from our quiet, peaceful group meditation together. This experience is hard to capture in a scientific study. It was a deeply moving interaction I will not forget.

Conclusion

The continuing work of educators and administrators should be to ensure the support to all students in accessing mindfulness lessons and activities in the future because they help reduce stress. Importantly, more research is warranted in addressing why students of color may not be taking advantage of wellness programming in high school settings. Although this study was not able to definitively say that mindfulness had a statistically significant impact on students' awareness and sense of acceptance, my teaching experiences overall show how impactful these meditation practices could be if they were implemented within a structured, longitudinal period of time. It is my hope that students will continue to have more exposure to mindfulness and meditation in school in order to help them navigate increasingly stressful situations in their lives.

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