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### An Unexpected Growth Journey: A Review and Self-Study of Health Habits & Why It Matters Today

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An Unexpected Growth Journey:

A Review and Self-Study of Health Habits & Why It Matters Today

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DePauw University - Honor Scholar Program

Class of 2021



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My interest in learning about health habits, specifically like meditation, came about early in my college career. Meditation has sparked my curiosity, from hearing about its benefits in psychology classes to discussing with friends about their own experiences with it. So, thank you Professor Roberts for that cognitive psychology research project my freshman year where I began to review the empirical benefits of meditation. Also, thank you to friends, like Ray, who further fueled my interest and willingness to meditate as you passionately shared your experiences (also, thanks for getting me that subscription to the Aware meditation app that one summer, without it I wouldn't have started meditating)!

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## The Thesis Journey

Midway through the fall semester of my senior year, I got hit by a car while skateboarding to work. Before that moment, my goal for this Honor Scholar senior thesis was to review and implement health habits that enhance one's ability to focus, manage stress, and be overall more productive. After that moment, the aim and use of these habits had a whole new meaning for me: learning to appreciate what I have and be present and cherish the moments with my loved ones. To be blunt, I shifted from stressing about what my future will look like to being humbled by the universe with a huge slap to the face (or, literally, car to the body), leading me to be grateful for what I have now. Honestly, though, I needed it.

As I started my senior year of college, I had a whole game plan: write my Psychology major and Honor Scholar theses, finish off the classes I needed to graduate, work part-time at this digital marketing startup, apply and interview to companies, practice the weekly health habit (i.e., meditate) an hour or so a day, maintain a workout schedule, and have fun with friends. Of course, our plans never go as planned (i.e., COVID-2020). As a result, my time and energy were all over the place, I was stressing about a million things, did not feel like I was progressing in any of my goals, and was so preoccupied with what I was going to do post-grad that even when I was hanging out with friends, I was never really present. Then came that Wednesday on October 14th, 2020.

8:30 AM: \*ring ring\* (alarm goes off); I startle, get out of bed, and turn off the alarm an hour before my 9:30 AM work meeting. I do my morning routine: brush my teeth, pour cold water on my face, eat a small breakfast, drink some H<sub>2</sub>O, and pray.

9:00 AM: I change, prep my lunch, put my laptop and other belongings in my backpack, grab the longboard and head out the door.

9:15 AM: Skateboard to work.

9:24(?) AM: Literally half a block away from work. BAM. As a driver rolls a stop sign, he hits me while I'm crossing the road on my longboard.

9:28 AM: (exact time of police report). Police, EMS, and Firefighters arrive at the scene. They start doing their regular routine when someone is in an accident: interview folks, make sure the injured (me) is stabilized, etc.

As you can probably guess, I ended up missing that 9:30 AM work meeting. To be honest, I am fortunate that it was only a minor accident. It could have turned out much worse than what it was, but thank God I ended up on the car's hood after impact and then rolled off after the driver stopped. Luckily, he was only going about 15 MPH as he rolled through the stop sign. Thankfully, I had no head injury; only the left side of my body, especially my left leg and knee, were in pain.

After the first-responders made sure I was all good and had no emergency issues in need of attention, they put me up on the stretcher and took me to the ambulance. By then, the adrenaline was kicking in, and the pain of my knee became bearable. I then called my boss, told him that I wouldn't be coming in because that was me in the ambulance (he was wondering what was going on outside his office window). To be honest, my stress skyrocketed during that first hour. That day, I had work meetings, classes, assignments due, work projects I had to work on, etc. My first thought was, "ugh, how am I going to get all of this done now?" But then, I also realized that I literally just got hit by a car and that this was a valid reason to have work and school expectations postponed. So, of course, I communicated with my professors and boss that I would be getting situated with the injury and get back to school/work when I could.

The school/work stress and anxiety that bogged down my mind was now put on the back burner, and instead, I had to deal with this injury. At the ER, after I was cared for and everything, I called my parents and told them what had happened. Initially, I confused my mom because she thought that I was in my car when a car hit me but then when my pops called her to talk about the incident and then clarified it, she called me back right away. We laughed off the misunderstanding, and then she told me they were coming down ASAP. By then, I was at the hospital, waiting to be discharged; I was stressing on “okay, now, how am I going to get home?” (mind you, the EMS guys took me to a hospital about 40 minutes outside the county I was hit in). I ended up texting like five friends asking if they were free, and the quickest one to respond said she would come scoop me up. So yay, I had that figured out.

Now, whenever someone goes out of their way to do something for me I feel embarrassingly bad. Like whenever someone asks “hey do you want this or that” I usually say no, because I don’t want to be a burden. Similarly, when my friends picked me up I kept on saying “oh, thank you so much... I appreciate you...”. During that entire car-ride, my friends were so caring and compassionate, they took me straight to McDonalds to get some grub because they knew I didn’t eat, one friend had me talk to her mom who is a nurse and told me what was best for recovery, and then my friends stopped by Walgreens, bought me an icy-hot pack and some pain-killers, and drove us all the way back to school. They even helped me up the stairs to my apartment, picked up my bags and all the other stuff, helped me get situated, pulled up a chair for my leg to be raised, and all. They really took care of me. A part of me felt bad because they were doing all of these things for me, and I usually do not like when people go out of their way for me, but also there was another part of me that felt lots of love and appreciation. Like wow, thank you, God, for such amazing friends. Then, they left to get back to their classes and

meetings and all. About an hour or so later, my parents showed up. They brought me dinner, checked out how I was doing, and helped me pack to head back home so I can have proper care, see a specialist, and eventually start physical therapy. As days went on, extended family called to see how I was doing, gave me their well-wishes and prayers, and all that good stuff.

During that time, the importance of love, family, and friends reawakened within me. My stress over school and work drifted away and the true-fulfilling values of life came rushing to me. It was as if, I was chasing after some sort of fulfillment that would never come (ie. school/work) then all of a sudden God turned my life upside-down and showed me straight to my face that the fulfillment/joy/happiness that I was seeking was all right there in front of me. I was just too blind to see it as I stressed and grinded on getting things done. But it was that moment of disruption that brought me to peace. The happiness and fulfilling joy was always there, only if I recognized and appreciated it. Except, I was in a mental rat-race seeking more and more, thinking money and a sense of esteem for feeling accomplished would bring me to fulfillment and joy. But it wasn't that, I realized it's the relationships of love and support that brings warming happiness. Ever since the accident, I have made it a priority to bring myself back to that reflective/appreciative state for this life and loved ones. However, I do struggle with always prioritizing relationships and the love I share in relationships. Nonetheless, it is something that I will always continue to work on, especially since one's quality of relationships has been found to be the most important aspect in the longest study on happiness (Waldinger et al., 2016).

Recent updates on Harvard's longest study of happiness has found that it is the quality of our relationships that significantly predicts life happiness and longevity (Waldinger et al., 2021; Waldinger, 2016). The Harvard Study of Development began surveying Harvard students in 1938 and have continued to survey them until their deaths (Waldinger et al., 2021). A 2017 Harvard

popular press article reviewed the intriguing findings and interviewed some of the major contributors to the study, like the present director of the study program: Robert Waldinger (Mineo, 2017). Waldinger was quoted stating that those participants “who were the most satisfied in their relationships at age 50 were the healthiest at age 80,” showing a correlation of health and longevity in connection with the quality of one’s relationships (Mineo, 2017). Evenmore, those participants who were satisfied with their marriage at age 80 felt less emotional and physical pain as compared to those who reported unhappy marriages (Mineo, 2017). Not only have healthy-happy relationships been found to significantly positively correlate with one’s happiness but also with the health of our cognitive functioning, as memory function was found to be better in partners who are happy in their relationships as compared to those couples who fight a lot (Mineo, 2017).

One of the most alarming findings from the Harvard longitudinal study is that loneliness kills, and is particularly alarming as we are in a global pandemic (Mineo, 2017). During this time of social isolation and distancing, we are, of course, protecting ourselves and others from spreading COVID-19 by staying isolated, but the isolation has made many lonely. A picture of that loneliness can be understood through the alarming rates of mental health issues found during the COVID-19 pandemic; so alarming that even the CDC called out for prevention and intervention efforts to reduce the rates (Czeisler et al., 2020). Some of the mental health variables measured found significant rates of substance use, depression, anxiety, job loss, and suicidal ideation throughout COVID (Czeisler et al., 2020). A reason these mental health rates may be so high is because of the virus, loss of a job, instability, but a major factor may have been due to the loneliness of social isolation. The Harvard longitudinal study on happiness can shed some light on these alarming mental health rates, as it may suggest that without normal social connection

and as a result of weakened quality in relationships, mental health rates have plummeted. Luckily, though, as I finalize this thesis in April 2021, vaccines are now being distributed and people are more social. I hope we can all internalize the importance of having high-quality/love-filled relationships as we exit this pandemic, so we can all live long and happy lives!

The main takeaway for me from Harvard's extensive study on happiness is how it relates to my thesis journey. The finding that close relationships were significantly associated with happiness throughout life, more so than money and fame, speaks directly to what I experienced before and after getting hit by a car (Mineo, 2017). At first, I was utilizing these health habits as a way to improve in school and work, be less stressed, and be more focused on goals that would lead me to "success." Initially, I thought it was money and esteemed accomplishments that would bring me fulfillment and happiness. But, no. After the accident, my perspective of life and practicing health habits led me to recognize how important it is for us to cherish our loved ones and build quality relationships. That moment of disruption led me to realize the fulfillment I was seeking was in front of me, always, through my loved ones, not some far-off socialized construct that puts value into some paper. Overall, this Harvard longitudinal study cements this revelation I came to due to the accident, which is that the most important thing for a happy and long life is the quality of our relationships (Waldinger et al., 2021).

In the spirit of helping folks improve their relationships and, most importantly, effectively address the CDC's call-to-action to improve mental health rates, this thesis will review health habits and discuss how its use in school and work settings should be enhanced to nourish mental health and improve relationships on a mass scale. In a sense, I have internalized the CDC's call to action since I, myself, have experienced some depressive dips in mental health. Thus, I am

looking for solutions to help myself so that I may be able to help others. Therefore, this self-study thesis is a journey to grow from my personal experiences and an opportunity to share the wisdom I have learned to help others, hopefully globally. In regards to the health habits reviewed to do so, I specifically emphasize two forms of meditation, heart coherence, and self-compassion, that improves one's quality of relationships by building up appreciation and gratitude to be more present and loving around loved-ones. I also review yoga and mindfulness meditation, which also improves mental health constructs but is not intentionally directed at improving relationships. I will discuss how I use these practices, from the ones that assisted me in improving my focus for productive purposes and the ones that assisted me in improving my love and appreciation for others and myself.

My first approach with these health habits I had been reviewing and practicing (listed later as the main part of this thesis) were being done in the mindset of: "how can I be as productive as possible, focus and manage stress better?" My main focus was on mindfulness meditation and yoga, with trying to enhance my attention and resilience skills by counting breaths or holding body postures so that I can better focus and persevere on my studies and work. But once the accident occurred and I began to realize the real important things in life, at least in my perspective, I began to reorient my approach to these health habits. Instead of simply trying to improve my focus, I began sitting in these meditations thanking God that I am alive and sharing gratitude for my loving friends and family. I came to appreciate the meditation practices of heart coherence and self-compassion, as I would sit in conscious gratitude for my loved ones and the many things they have done for me. Through these practices, with conscious cultivation of love and appreciation during meditations, I would generally feel more joyous, more happy, more connected, and more present with my loved ones. Instead of being preoccupied with what I

had to do when spending time with friends and family, I was more present, more communicative, laughing and enjoying the time more. It helped me make a clear distinction between work-life and family-life. But, it is still hard to keep that balance till this day, and this thesis has evolved as I grapple with the balance.

### Thesis Overview

Before we jump in, it is important to make clear to the reader what this thesis will do and what it will not do. First, I will review the empirical evidence behind the main health habits that I decided to start and implement. Then, I will detail how I practiced these habits on myself, how I assessed any change for certain health constructs, and review my experience of this self-study. Most importantly, I will describe why practicing health habits, like meditation, is crucially important in our present moment as a result of the mental health crisis being exacerbated by COVID-19. In doing so, the use of mindfulness through programs and apps in school and work will be discussed then I will provide suggestions to further the practice and instill a mindful culture to effectively address the mental health crisis.

What this thesis will *not* do is critically assess why there is a mental health crisis. I do, however, recognize its importance in deconstructing why our society is suffering from poor mental health, whether that has to do with our neoliberal-capitalist society that prioritizes profits and consumption over our basic human needs and health or even extreme forms of isolation (not just because of a pandemic, but maybe due to the socialized motive to work tirelessly in order to achieve riches or fame). The critical analysis of the alarming mental health rates being viewed as a symptom of a much larger societal issue would be my natural second-step in wrestling with these ideas. However, to keep my sanity and not bite off more than I can chew for this thesis, I will discuss methods to help oneself in this broken system we live in. How these methods may be

a stepping stone to help fix the broken system will be a question I will continue to wrestle with beyond this project.

## **Health Habits**

My goal was to review and practice different health habits that are not as commonly known as, say, sleep, exercise, or diet. In particular, I reviewed health effects for yoga and three different types of meditation: mindfulness, heart coherence, and self-compassion meditation styles. The growing popularity of meditation, both in empirical research and across social media, has led to mass-market appeal. In fact, apps like Calm and Headspace had more than 150 million downloads, together, as of 2020 (Curry, 2021). With this large number of users, it is important to know exactly what the benefits of meditation are, across the different styles. Yoga is similarly growing in popularity. In fact, surveys conducted in 2012 and 2016 found a 50% increase in Americans practicing yoga (Wei, 2016).

Overall, my aim was to review the mental, physical, and cognitive health benefits of these habits. Mental health constitutes our psychological, emotional, and social well-being and concerns certain mental health illnesses such as chronic stress, anxiety, depression, suicide, and more (CDC, 2018). In regards to physical health, I discuss the effects of these habits on the body's immune system, stress responses from the sympathetic nervous system, and relaxation responses from the parasympathetic nervous system. In regards to cognitive function, I discuss effects on the mind's attention and processing speeds, executive function, and memory. For each health habit below, I introduce the habit, and then summarize the empirical evidence supporting its use via three kinds of sources: an extensive empirical review, meta-analyses, and empirical studies.

## Yoga

Ancient Eastern religious traditions have created techniques to create a “radical transformation of existence” (Koller, 2006, p.163). Indian traditions such as Buddhism, Jainism, and Upanishadic Hinduism (and even all Abrahamic religions for this matter) all share the same belief that life is contaminated with suffering. Whether one is the poorest of the poor or the richest of the rich, pain and hardship seem inevitable at any point in life. Ancient Eastern theological philosophy prescribed techniques that aim at ‘liberating’ the self of pain by ‘joining’ oneself with the higher Self, understood as God or Atman (Koller, 2006). To overcome life plagued with misery, one must undergo extreme self-discipline for the purposes of liberation. These techniques of liberation are called yoga.

Yoga has a stereotypical understanding in the West as simply stretch-like exercise but has a much deeper meaning rooted in Ancient Upanishadic Hinduism. John M. Koller, the author of *The Indian Way*, describes yoga as “the control of deeper powers of existence for the sake of transformation and liberation” (Koller, 2006, p. 170). Koller (2006) goes on to describe how through extreme self-discipline and self-control we can ‘unveil’ the deeper powers within us. There are 8 yogic techniques of self-discipline that help to create this radical transformation of self: 1.moral restraints (yama) 2.disciplines (niyama), 3.bodily postures (asanas), 4.regulation of the breath energy (pranayama), 5.sense withdrawal (pratyahara), 6.concentration (dharana), 7.Meditation (dhyana), and lastly, 8.deep absorption, described as the pure witnessing of consciousness where the true Self shines through, which essentially means enlightenment (samdhi) (Koller, 2006, p.174-177).

The third yogic technique, asanas, or bodily postures, is the stereotypical understanding of yoga in the West. It was this yogic technique I originally became introduced to as the concept

of yoga, and it will be the focus of my yoga-related efforts for this section. According to Koller (2006), yoga asanas aim to “bring the body under the control of consciousness instead of allowing it to control consciousness” (Koller, 2006, p. 176). Essentially, one uses their will-power to bring the body under control within a stretch/extended movement, where the “postures must be practiced until they become totally effortless” (Koller, 2006, p.176). The idea behind yoga bodily postures is so “the body can become a vehicle of liberation rather than bondage” (bondage ~ suffering); as opposed to having one’s body limit oneself, the goal is to have one’s body bring one into freedom, “freedom from the physical support system” (Koller, 2006, p.176).

There is a multitude of scientific evidence for the mental and physical health benefits of yoga asanas outside of the religious-esoteric framework. In fact, yoga is categorized within the National Institute of Health (NIH) under the National Center for Complementary and Integrative Health (NCCIH) (NIH, 2019). Since the bodily posture form of yoga is commonly used in the West, both generally by everyday folks like me (Wei, 2016) and as a complementary health treatment for those with medical conditions (NIH, 2019), I will be reviewing the empirical evidence on the benefits that support its use.

First, a review of more than 20 empirical studies outlined benefits of yoga for both the physical body and the mental subjective experience of life (Woodyard, 2011). Some of the most notable findings were that yoga lessens depression, increases levels of serotonin (happy neurotransmitter), improves flexibility, reduces body aches and pains, like lower back pain, neck pain, etc., helps to reduce arthritis pain, increases blood flow, hemoglobin levels, and red blood cell production to enhance oxygen circulation in the body (Woodyard, 2011). Yoga also helps to thin blood for those with high-risk comorbidities and generally improves the body’s function,

improves sleep and subjective quality of sleep, improves subjective quality of life, increases energy, promotes healing, reduces stress, and helps to decrease adverse treatment effects in cancer patients, as well as helping to weaken addictions, such as eating disorders, and much more (Woodyard, 2011). All in all, empirical evidence supports that yoga helps improve mental and physical health. In fact, many of these benefits of yoga stem from the deactivation of the sympathetic nervous system, which stimulates fight-or-flight responses, and instead the activation of the parasympathetic nervous system, which is the body's natural relaxation and healing response (Woodyard, 2011). With the activation of the parasympathetic nervous system, the body reboots by relaxing and repairing itself, therefore lowering heart rate, respiratory rate, blood pressure, and anxiety (Woodyard, 2011). When the body is not given sufficient time to relax in the parasympathetic state, the body can overreact in the sympathetic state by too much stress and thus cause a multitude of diseases when the sympathetic, flight-or-flight response is too active. Other researchers note how stress stimulates bodily responses, such as high blood pressure, inflammation (suppression of the immune system), high blood clotting, higher heart rate, etc. that lead to diseases such as obesity, diabetes, cancer, etc. (Ross & Thomas, 2010).

Ross and Thomas reviewed 12 empirical studies that compared the respective effects of yoga and exercise on mental and physical health. The researchers noted that yoga and exercise are the largest comparison studies involving the effects of yoga, which is what motivated them to focus on these differences. Furthermore, the researchers looked for "yoga" studies that led to 183 articles since 1970 and only included the studies if they were deemed "quality research" which entails original work, satisfactory amount of participants, reasonable design, and minimum bias, which offers confidence to believe they are representative studies (Ross & Thomas, 2010, p. 4). However, it is important to note that the exercise variables within most of the studies reviewed

have been walking, running, dancing, and stationary biking alongside some stretches (Ross & Thomas, 2010). Within their summary, they found that for yoga and exercise intervention durations ranging from 5 weeks to 6 months, yoga is more beneficial than exercise in most outcomes, such as balance, fatigue, mood (both negative & positive affect), quality of life, sleep, social and occupational functioning, strength, stress, etc. (Ross & Thomas, 2010). Ross and Thomas suggest that yoga is an effective tool for treating disease and describes how yoga can be positively impactful in both physical and mental health.

To look at yoga's effect more critically, we will now review meta-analyses that focused on analyzing yoga's effect size across different variables. The most cited yoga meta-analysis focused on yoga's effects on depression and concluded that yoga does indeed help improve mental health and therefore should be considered a supportive treatment option (Cramer et al., 2013). The meta-analysis analyzed 12 randomized controlled trial studies with more than 600 participants who were diagnosed with a depressive disorder or signaled elevated levels of depression (Cramer et al., 2013). Overall, the meta-analysis found moderate effect sizes for short-term effects of yoga being better than usual care for depression, meaning the studies examining yoga's effects on depressive participants were found to be more effective in improving their mental health as opposed to regular treatments (Cramer et al., 2013). I reviewed a couple of other meta-analyses and they concluded that yoga practice has significant effects for other major outcomes. Specifically, Cabral et al. (2011) conducted a meta-analysis on ten randomized-control trial studies looking at yoga as a complementary treatment for other psychiatric disorders, such as schizophrenia, depression, anxiety, and PTSD (Cabral et al., 2011). Cabral et al. (2011) found a statistically significant effect size showing yoga is effective as a complementary treatment for major psychiatric disorders. Pascoe et al. (2017) conducted a

meta-analysis on 42 randomized-control trial yoga studies looking at the effects on physiological measures. Pascoe et al. (2017) concluded that yoga “appears” to be correlated with improved regulation for the sympathetic nervous system, with preliminary studies showing a decrease of physiological stress (Pascoe et al., 2017). Furthermore, another Cramer et al. (2013) study conducted a meta-analysis on ten randomized control trial yoga studies and concluded that yoga relieves chronic lower back pain, with strong evidence for relief in the short-term and moderate evidence for the long-term (Cramer et al., 2013). All in all, these meta-analyses support the point that yoga does help to boost mental and physical health. Not only that, but studies have found that yoga helps with cognition too, making us smarter (Gothe & McAuley, 2015).

Gothe and McAuley (2015) analyzed 15 randomized control-trial studies and 7 acute exposure studies to investigate the effects of yoga on cognition. In particular, they differentiated their analysis of yoga studies by examining chronic effects from extended yoga interventions (randomized control trials) as compared to acute immediate effects right after a singular yoga practice (acute exposure studies). Their main measures of cognition consisted of attention and processing speeds, executive function, and working memory. Their main results concluded that yoga, for chronic long-term effects, as found through intervention programs, has a moderate effect on overall cognition ( $g = 0.33$ ), with the most influential effect on attention and processing speed, which can be understood as one’s steady focused concentration and rapid information processing ( $g = 0.29$ ), a moderate effect on executive function, which is our cognitive skill-set that is “responsible for planning, initiation, sequencing, and monitoring of complex, goal-directed behavior, [and our] working memory (ie. short-term storage and manipulation of information)” ( $g = 0.27$ ) and a marginally significant effect on memory, which is the mind’s ability to absorb, recall, and recognize “previously encountered information” ( $g = 0.18$ ) (Gothe

& McAuley, 2015, p. 5-6). In regards to acute immediate-effects of a single yoga session, it was found to have the largest and strongest effect for yoga on cognition ( $g = .56$ ), with the strongest effect for memory ( $g = 0.78$ ) and still significant moderate to large effects for attention and processing speeds ( $g = 0.49$ ) and executive function ( $g = 0.39$ ) (Gothe & McAuley, 2015). Participants were all measured on their variables before the interventions began but post-treatment measures differed for randomized control trials and acute studies. Participants in the long-term interventions were measured some time after the weeks to months-long yoga programs while participants in the acute yoga practice studies were measured immediately after their single practice, which probably explains the much larger effect sizes for acute exposure studies as compared to the repeated exposure studies. In other words, a consistent long-term yoga practice generally and moderately improves cognition, but right after a single yoga practice, one's cognitive abilities show large enhancements. All in all, these effect sizes suggest that yoga is a great practice to improve one's cognitive function. However, it is important to note the limitations of this meta-analysis since some of the studies included had small sample sizes, different types of yoga interventions, and smaller amounts of acute studies as compared to long-term intervention studies. Nonetheless, the findings of the combined studies support the notion that yoga helps to improve cognition, allowing us to be smarter!

The yoga-intervention reviews and meta-analyses have arrived at the same conclusion: there is scientific support that yoga improves mental, physical, and cognitive well-being. These researchers would all suggest that communities can utilize yoga to improve lives, whether for clinical patients or even the everyday-Joe. In fact, yoga has been used by companies to help their employees improve their physical and mental health so that the entire organization, as a whole, can be healthier and prosper.

In one study, occupational medicine researchers tested yoga's ability to reduce perceived stress and lower back pain with full-time government workers (Hartfiel et al., 2012). This study focused specifically on stress and lower-back pain because it contributes greatly to workplace absence and has thereby been found to cost the British industry about \$17 billion a year (Hartfiel et al., 2012). Within the study, 82 employees from the British local government authority partook in the study and were randomly assigned to an experimental yoga group or the controlled no-change group. Each week, the yoga group had one 50 minute in-person instructor yoga session at work either at lunch or after work and were given a 20-minute pre-recorded guided yoga CD in which participants were asked to practice twice more at home. A yoga-mindfulness based intervention was used, in particular Dru Yoga, which is "characterized by graceful movements, directed breathing and relaxation techniques" (Hartfiel et al., 2012, p. 607). The researchers used multiple surveys to identify and measure chronic back pain and a perceived stress scale that measured stress during the last month (Hartfiel et al., 2012). Their main findings showed significant improvements in psychological well-being and significant reductions in perceived stress and lower back pain in the yoga experimental group; however, the control group did not show any significant changes (Hartfiel et al., 2012). The researchers conclude their study with a suggestion for workplaces to integrate yoga at work to provide a time and cost-effective solution for cutting the expensive effects of stress and back pain (Hartfiel et al., 2012).

Not only can yoga-mindfulness interventions help corporations, but it also shows benefits in schools. Harris et al. (2015) set out to measure whether a yoga-based mindfulness intervention would assist with the stressful reality of being a teacher. Sixty-four educators across two schools enrolled in a wait-listed controlled study where one school received the yoga-based intervention and then the other (Harris et al., 2015). A yoga instructor led the educators in a 20-minute

yoga-mindfulness session four days a week before school for 16 weeks. Specifically, the yoga-mindfulness session contained asana postures, a meditation on the breath, and stillness. Participants completed many surveys that measured mindfulness and emotional functioning, teaching efficacy, stress, burnout, and wellbeing (Harris et al., 2015). Participants in the yoga condition scored notably higher in mindful observation and distress tolerance, classroom management efficacy, and positive emotional wellbeing as compared to control participants. Additionally, the experimental group improved on work-related stress indicators much more than the control group. However, the researchers note that these differences were only observed with a small to medium effect size, so it is not curing anything but definitely is effective in helping educators across a variety of measures. Furthermore, the educators in the yoga-based intervention greatly enjoyed the program and experienced improvements in classroom management. All in all, yoga helped educators improve their teaching skills, effectively helping students as well.

All in all, yoga has been found to improve one's life, whether that be personal mental health, physical pain, cognitive abilities, and even improved work-stressors for teachers and other full-time workers, like government officials. Perhaps more workplaces and schools should advocate yoga practice, and maybe even host sessions. I suppose the scientific evidence behind yoga supports the Ancient religious theosophical understanding of yoga: that indeed, yoga is a vehicle for transformation of the self. The mental, physical, and cognitive health benefits of yoga can perhaps stimulate a dramatic change in the self if practiced for long periods of time. Just as Gothe and McAuley (2015) showed, a single yoga session can dramatically enhance one's cognitive abilities right after a practice, alongside general improvements with long-term practice, but even with mental health improvements, one can possibly grow closer to their goals by

training their minds and bodies through yoga. Given the scientific evidence surrounding yoga's ability to improve mental and physical well-being, I believed yoga was a promising practice to incorporate in my self-study to help manage stress, improve focus, and become more productive. I predicted a possible domino effect, in which if yoga improves my parasympathetic nervous system to calm my body and initiate the body's self-healing process, I would also see an improvement in my sense of tranquility and mindfulness.

### **Mindfulness Meditation**

I know there is a lot of research being discussed so let's take a minute to rejuvenate our focus by being mindful: 4 seconds breathing in, 4 second breath-hold, and breathe out for as long as you can, and repeat. Consciously follow the breath as it comes in and out, filling and leaving your lungs, sensing the rise and fall of your stomach and chest. Keep it going, feel the tension being held in your body release as your jaw loosens, shoulders drop from your ears, and forehead relaxes.

Practicing mindfulness through meditation brings many benefits. Mindfulness can be defined as an "awareness of one's moment-to-moment experience nonjudgmentally and with acceptance" and is scientifically supported to increase one's focus, personal well-being, quality of life, enhance behavioral, attentional, and emotional regulation, and reduce psychological stressors such as anxiety, depression, and negative thoughts (Keng et al., 2011, p. 1-2).

Throughout the past few decades, mindfulness meditation practice has become increasingly applied in both clinical and non-clinical settings to nourish psychological health.

Mindfulness has become especially popular in modern scientific research, with mass studies supporting its physical and mental health benefits. Originally, mindfulness practice derived from Buddhist religious-spiritual traditions where it is taught that mindfulness

meditation and ethical living standards led to liberation from suffering and achievement of tranquility and peace of nirvana, or enlightenment (Koller, 2016). This Eastern religious practice of meditation made its way over to the West as Zen Buddhism was popularized in the 1950s and 1960s with literary works (Keng et al., 2011). Psychological interest in mindfulness did not start until the 1960s and empirical research boomed ever since the 1970s, with psychological, neurological, and biological scientific studies (Keng et al., 2011).

In a recent review of the empirical evidence of the effects of mindfulness on mental health, Keng et al. (2011) reviewed self-reported correlational studies, randomized controlled studies, and controlled laboratory-styled studies which all support mindfulness's ability to improve psychological health. Their main conclusions discuss how mindfulness stimulates positive psychological effects such as improved well-being, reduced psychological negative symptoms such as anxiety, lessened emotional reactivity, and improved behavioral regulation (Keng et al., 2011). Keng referenced how mindfulness as a characteristic mediates the relationship between meditation experience and psychological well-being, meaning that one's mindful ability as built through meditation experience stimulates psychological well-being (Keng et al., 2011). Not only is one's psychological well-being improved through mindfulness but also one's cognitive abilities for memory, attention regulation, focus, and other cognitive functions (Keng et al., 2011). Keng et al. outline clinical based mindfulness interventions, such as mindfulness-based stress reduction (MBSR) or acceptance and compassion therapy (ACT), and discuss associated empirical findings in being able to decrease harmful habits, such as addiction, and improve mental well-being (Keng et al., 2011). Perhaps one of the most surprising research findings of mindfulness meditation is that there are immediate benefits of the practice (Keng et al., 2011). After a brief training session, one can achieve a more accepting attitude, lessen one's

emotional reactivity to negative psychological stimuli, and improve one's positive emotional responsiveness (Keng et al., 2011). So, even if you only have 5 minutes to spare for mindfulness meditation, you can still nourish your mental health!

A more recent systematic review of the empirical findings on mindfulness concluded similar findings of improvements in mental health, in addition with cognitive functioning (Tomlinson et al., 2018). In fact, Tomlinson et al. (2018) reviewed 93 studies and concluded three main findings for mindfulness: a significant negative relationship to mental health issues like depression, a significant positive correlation to flexible cognitive functions like less proneness to distraction, and a significant positive correlation to improved emotional regulation and processing (Tomlinson et al., 2018). In other words, mindfulness has been found to not only significantly improve mental health but also cognition.

Another systematic review examined mindfulness' effects on physical health, but evidence was not as strong. In fact, Ngô stated that mindfulness "seems" to improve immune functions, decrease inflammation, lower the body's stress response, and increase serotonin, the body's feel-good chemical; seemingly so because evidence is not the strongest (Ngô, 2013). All in all, though, the studies from Keng et al. (2011), Tomlinson et al. (2018), and Ngô (2013) suggest mindfulness helps to moderately improve mental health and cognitive function, with weak-evidence for improvement in physical health.

The benefits of mindfulness meditation may seem 'too-good-to-be-true' and even knowledgeable empirical researchers on mindfulness may lack confidence in its benefits as a result of poor research designs and small effect sizes in some studies. To help list the benefits of mindfulness, the Berkeley's *Greater Good Magazine* article *The State of Mindfulness Science* lists what empirical science does and does not know about mindfulness meditation (Smith et al.,

2017). The article references empirical studies that describe what mindfulness can benefit. For example, there are empirical studies concluding that mindfulness ‘sharpens’ our attention regulation and focusing ability alongside reducing mind-wandering and our proneness to be distracted. Consistent long-term meditators have been found to have significant resilience to stress as it weakens the stress-inflammatory response of the nervous system (or sympathetic nervous system) and creates a more ‘sustainable’ approach to handling stress. Furthermore, empirical studies note that mindfulness meditation improves one’s sense of compassion for oneself and others while also improving the quality of relationships, including romantic and even parent-child relationships. Additionally, mindfulness has been found to reduce mental biases, such as racism, ageism, and bias against the homeless, and even reduces personal biased tendencies which focus on negativity.

Even though mindfulness meditation may improve mental well-being, such as reduction in anxiety and depression, empirical researchers who conducted meta-analyses note that meditation programs are not as statistically significant, but nonetheless may be better than prescription drugs (Smith et al., 2017; Goyal et al., 2014). As a result, researchers state that mindfulness meditation should not replace medical treatments but rather be a highly-considered addition to treatment for those with mental disorders. Although there has been a lot of empirical studies showing mindfulness meditation’s ability to improve one’s ability to focus, reduce stress, improve stress-management, improve mental well-being, increase feelings of compassion, and even reduce mental biases, there was only a small to moderate effect size founded by a meta-analysis of 47 randomized control trial mindfulness studies (Smith et al., 2017; Goyal et al., 2014). The discrepancy in research may be due to publication biases, perhaps the researchers are strong supporters or opponents of mindfulness due to personal reasons or maybe they are funded

to find certain kinds of findings. Nonetheless, it is important to keep a balanced understanding of the research. In regards to Goyal et al.'s (2014) meta-analysis, they specifically found small to moderate improvements in anxiety, depression, and pain; whereas they found “low” evidence of improved stress and quality of life (Goyal et al., 2014). More surprisingly, they found low to no, or insufficient, evidence of meditation affecting positive mood, attention, substance use, eating habits, sleep, and weight (Goyal et al., 2014). It seems mindfulness meditation's benefits are much smaller than presumed. Despite small to moderate improvements in anxiety, depression, and pain, the researchers note that meditation is “comparable with what would be expected from the use of an antidepressant in a primary care population but without the associated toxicities” (Goyal et al., 2014, p. 6). Specifically, Goyal references larger effect sizes from mindfulness programs, ranging from .22 to .38 and .23 to .30 for anxiety and depression, respectively, whereas antidepressants had an effect size of .11 to .17 for mild-moderate depression and severe depression, respectively (Goyal et al., 2014). Therefore, these results suggest that mindfulness meditation is still better than having to take medication and risk side-effects. To clarify what counts as meditation, most studies had mindfulness-based stress reduction programs that averaged about 20 to 27.5 hours of meditation throughout 8 weeks, essentially averaging 3 hours of meditation a week which could be broken up into 1 hr sessions or 30 minute sessions (Goyal et al., 2014).

In both clinical and non-clinical populations, mindfulness meditation has been found to improve psychological well-being. Hofmann et al. (2010) conducted a meta-analysis review on 39 studies to analyze mindfulness interventions' effects on depression and anxiety for 1,140 clinical patients who were receiving mindfulness therapy for their conditions, whether cancer, generalized anxiety disorder, depression, and other psychiatric or medical conditions. They

found that mindfulness-based therapies were statistically and largely effective in improving anxiety and depressive symptoms for clinically diagnosed anxiety and depressed populations, with large 0.97 and 0.95 effect sizes, respectively (Hofmann et al. 2010). Furthermore, significant effects were found for mindfulness interventions on anxiety symptoms for those with anxiety disorders, cancer, and pain disorders but not clinically depressed patients. In regards to mindfulness on decreasing depression, significant effects were found for those with clinical depression, anxiety disorder, pain, and cancer. Similarly, mindfulness meditation has also been found to improve psychological well-being in non-clinical patients as summarized in Eberth and Sedlmeier's meta-analysis review on 39 mindfulness studies (2012).

Eberth and Sedlmeier (2012) examined mindfulness' effects on non-clinical populations, differentiating from those who practiced in mindfulness-based stress reduction (MBSR) intervention programs and "pure" meditation practice. On one hand, MBSR intervention programs are often course-style programs with inexperienced meditators guided by an experienced instructor and can be understood as a mix of mindfulness practice with education on mindfulness and its importance in different contexts. On the other hand, pure meditation can be understood as the sole practice of mindfulness meditation, such as meditators at a meditation center. Eberth and Sedlmeier distinguished these two different contexts since MBSR correlated with higher rates of psychological well-being whereas "pure" mindfulness correlated with higher rates of the mindfulness trait (Eberth & Sedlmeier, 2012, p. 174). Eberth and Sedlmeier suggest that it is the "psychoeducation" piece within the MBSR programs that may increase improvements as a result of learning, discussing, and rationalizing the application of mindfulness in one's life (Eberth & Sedlmeier, 2012, p. 185). Also, it may be the participants' expectations since MBSR is advertised to reduce stress whereas those meditating at centers may be aiming to

achieve wisdom or higher mental states, leading to different results (Eberth & Sedlmeier, 2012). I speculate that the education piece in rationalizing to oneself the importance of mindfulness is where it helps an individual to apply the practice efficiently, which leads to more profound psychological benefits.

Nevertheless, Eberth & Sedlmeier distinguished how MBSR programs were more effective than “pure” meditation in increasing overall psychological well-being in a non-clinical population. To be specific, the overall weighted mean effect size of the 17 MBSR studies reviewed was an  $r = 0.31$  whereas for the 25 pure meditation studies was  $r = 0.25$  across a multitude of variables, such as wellbeing, cognition, stress, mindfulness, positive emotions, attention, etc. (Eberth & Sedlmeier, 2012). Regardless, they found a moderate statistical correlation ( $r = .27$ ) between mindfulness and overall psychological health improvements, meaning the more one is mindful, by meditating, the better their mental well-being is likely to be, in any practice context (Eberth & Sedlmeier, 2012). Across all studies and mindfulness practice type, there were moderate to strong effect sizes ranging from .3 to .4 correlation rates on major variables such as improvements on negative personality characteristics, stress reduction, self-attributed mindfulness, intelligence, wellbeing, and attention (Eberth & Sedlmeier, 2012). All in all, Eberth & Sedlmeier found significant effect-sizes of meditation on a multitude of psychological health variables across both guided and non-guided mindfulness practice.

With all of these mental improvements being found as a result of mindfulness meditation, one should ask how well mindfulness may help in the workplace. A recent 2020 mindfulness research has found significant correlations between individual mindfulness levels with high levels of work engagement, which inherently positively influences employee performance (Liu et al., 2020). After skimming through this article the first time, my initial thought was, “Hmm,

mindfulness must improve our work efforts, gotta meditate so I can actually finish this thesis!”

The study measured mindfulness levels, team mindfulness levels, work engagement and recovery level. Recovery level is the ability to control one-self and recover from stress and boredom and was sought as the mediating role for work engagement in the workplace (Liu et al., 2020). As summarized by Liu et al., high levels of recovery have been found to increase work engagement, enhance one’s mental energies, both cognitive and emotional, for the workplace, and have the ability to relax more easily, therefore having better stress and energy level management (Liu et al., 2020). Team mindfulness was investigated because workers often work together in groups and, more importantly, the cohesive focused attention of a team on the matters at hand and the awareness of each others' needs is considered an integral piece to the flow and productivity of work (Liu et al., 2020). These measures were obtained and analyzed for 350 employees from 89 teams at three service companies in China. The survey was administered 3 different times within a year then statistical analyses were run to look for correlations. Significant positive correlations were found amongst all variables: individual mindfulness with work engagement and recovery level, recovery level with work engagement, team mindfulness with individual mindfulness and recovery level (Liu et al., 2020, p. 5).

In conclusion, the researchers found that mindfulness enhances work engagement via its positive effects on recovery levels (Liu et al., 2020). In other words, yes mindfulness does improve our work efforts, specifically through the mediating factor of an improved ability to recover from unproductive emotions, distractions, or disruptions of work. Now, if we want to improve our work, let’s meditate! This study’s results have important implications for implementing mindfulness in the workplace and should be used to motivate corporations, big and small, to adopt mindfulness practices.

Despite the mix of results in confidence of effects as described from the reviews and meta-analyses, mindfulness meditation still seems to be worth practicing. All in all, the debate on how strong the effects of mindfulness truly are does not sway me from being convinced mindfulness can help. I would like to believe that the habit of mindfulness meditation still offers significant improvements, such as improving our work ethic and lessening anxiety and depression levels. Despite hesitancy, I still ran with it for this self-study. I predicted increased mindfulness, of course, decreased stress, or at least better management of stress, and decreased anxiety as I continued to practice.

### **Self-Compassion**

Imagine a close friend or family member who comes to you and expresses how they have been feeling down lately. What would you do? You would probably do what any good friend would do, be supportive and compassionate while actively listening to your friend or family and help them know that they are not alone and that you are there for them. Now, how often do we do this for ourselves when we feel down or experience feelings of failure, inadequacy, or stress? As important as it is to be present and supportive for our friends and family, it is just as important to be our own supportive best friend who actively listens, acknowledges, and shares support and compassion. This can be defined as self-compassion, which has years of psychological research supporting its beneficial impact.

Self-compassion has three main elements, as the leading expert Dr. Kristin Neff operationally defines on her website (Neff, 2021). First, instead of being harsh self-critics who negatively judge ourselves for our failures, self-compassion calls us to be “warm and understanding to ourselves when we suffer, fail, or feel inadequate” (Neff, 2021). Second, self-compassion calls us to recognize the common humanity we all share, especially as suffering

and feelings of inadequacy are all part of the human experience (Neff, 2021). Despite those common feelings of isolation when we are down in the dumps, we must remind ourselves that we are not alone. Third, self-compassion calls us to be mindful when we experience negative feelings and emotions (Neff, 2021). Dr. Neff reminds us that mindfulness is a “non-judgmental, receptive mind state in which one observes thoughts and feelings as they are, without trying to suppress or deny them,” and is an important piece to being self-compassionate (Neff, 2021). Dr. Neff describes how mindfulness is key to being self-compassionate especially with regards to acknowledging and processing negative thoughts and emotions in order to overcome them. For example, instead of suppressing negativity, like ignoring the emotion of inadequacy when around person x, or overly identifying with negativity, like identifying with inadequacy such as “I am inadequate,” mindfulness allows us to acknowledge and process negativity, perhaps even detaching us from the negative belief, and then self-compassion allows us to overcome that negativity with positivity.

Many empirical studies have validated self-compassion as a signal of mental well-being. A recent 2015 meta-analysis of the connections between self-compassion and well-being found that self-compassion significantly correlates with mental well-being (Zessin et al., 2015). There are different concepts to well-being, but it could be cohesively understood as the way people evaluate their life, both emotionally and cognitively, including measures of the pleasant and positive effects one experiences and even the degree to which one is fulfilled in their human potential with the sense of satisfaction of their life (Zessin et al., 2015). Specifically, the meta-analysis screened 1,433 empirical studies and found 79 data samples consisting of 16,416 participants to run analyses. Overall, the researchers found that self-compassion and well-being have a strong ( $r = .47$ ) correlation. The researchers concluded that this correlation coefficient can

be understood as a medium to large effect size (Zessin et al., 2015). Furthermore, the researchers reviewed self-compassion interventions (i.e. self-compassion program) to test the causal relationship between self-compassion and well-being. Zessin et al. (2015) found a statistically significant small to moderate causal effect size ( $g = .36$ ) in which self-compassion training interventions lead to better well-being. All in all, empirical evidence from Zessin et al.'s (2015) meta-analysis validates how the more one is self-compassionate, the more one has a healthier sense of well-being.

It is important to note that self-compassion is not only positively correlated with good mental health, like a high sense of well-being and life satisfaction, but is also negatively correlated with psychopathology, particularly like symptoms of depression (Macbeth & Gumley, 2012). In fact, there was a 2012 meta-analysis that examined the relationship between self-compassion and psychopathology factors. In this study, researchers Macbeth and Gumley (2012) analyzed 20 sample sets from 14 studies that examined the association of psychopathological factors and self-compassion. The meta-analysis was not focused on interventions or causal changes, but the researchers nonetheless found statistically significant negative correlations between self-compassion and different psychopathological measures, such as depression ( $r = -.52$ ), anxiety ( $r = -.51$ ), and stress ( $r = -.54$ ) (Macbeth & Gumley, 2012). Overall, they reported a large significant effect size for the negative correlation relationship between self-compassion and negative mental-health states ( $r = -.54$ ) (Macbeth & Gumley, 2012). As a result, this meta-analysis shows that self-compassionate individuals tend to be less depressed, anxious, and stressed. This research goes to show how important it is to show oneself kindness, recognize that we are not alone in our failures, and be mindful, especially as depression, anxiety, and chronic stress are so common.

Self-compassion has also been found to have significant correlations with physical health. In particular, Phillips and Hine (2019) reviewed and conducted a meta-analysis on 94 peer-reviewed articles and found significant positive correlations with self-compassion levels and practices with physical health ( $r = .18$ ) and healthy behavior ( $r = .26$ ). Specifically, their analyses found the strongest effects of self-compassion correlations to overall physical health, immune health, combined health behavior, sleep, and the avoidance of danger (Phillips & Hine, 2019). In other words, self-compassionate individuals tend to be physically healthier, like better immune systems, and have healthier habits, like healthy levels of sleep, according to Phillips & Hine's (2019) study. Despite smaller correlation effect sizes compared to the mental health measures above, the researchers conclude that self-compassion is still associated with stronger physical health (Phillips & Hine, 2019).

Touching back on Zessin et. al's (2015) finding that self-compassion has a causal effect on well-being, I'd like to specifically define self-compassion interventions that were found to lead to health improvements. First, the most popular self-compassion intervention was created by Dr. Neff and her colleague, Dr. Germer, and is called the Mindful Self-Compassion (MSC) program (Neff & Germer, 2012). The MSC program lasts 8 weeks with a 2-hour meeting each week alongside a retreat at the end. The entire program is designed to increase participants' self-compassion. More specifically, the MSC program teaches self-compassion skills that aim to be applied both formally, like sitting meditation, and informally, such as daily-life moments habits, to a group being led by both a clinician and self-compassion instructor. Some of the main formal practices taught and encouraged to practice outside of the intervention were different forms of self-compassion meditations such as loving-kindness meditation and affectionate breathing, both practices that focus on cultivating positive feelings of compassion, love, and

kindness for the self while mindfully breathing in and out (with an extra tip to create a half-smile). Some of the main informal practices taught were to put one's hands on one's heart in times of stress or repeating a set of self-compassion phrases, like “may I be calm” or “may I accept myself,” for use in daily life. Each week of the MSC program discusses something different, such as mindfulness, application of self-compassion, inner self-compassionate voice, living in accordance with values, dealing with interpersonal challenges, and more all while also promoting self-compassion practices (Neff & Germer, 2012).

The MSC program was first piloted in 2012 by Neff and Germer and led to statistically significant improvements in self-compassion, mindfulness, and different measures of well-being, such as happiness, life satisfaction, and connectedness. There were two studies completed in the pilot testing, that measured participants' negative and positive mental states before, during, and after the study. The first consisted of 23 participants in the MSC program and resulted in significant increases in self-compassion, mindfulness, life satisfaction, and happiness, alongside decreases in depression, anxiety, and stress from measurements directly before and after the program (Neff & Germer, 2012). Six months after the study, researchers measured some of the participants again and found that the gains in self-compassion and mindfulness were maintained since the intervention. In their second study, Neff and Germer completed a randomized controlled trial with 25 participants in the treatment group that went through a similar MSC program and 27 in the waitlist control group. Similar results were found, with the intervention group improving in all measures directly after the program, including increases in self-compassion, mindfulness, and well-being measures with decreases in depression, stress, and anxiety (Neff & Germer, 2012). Even after six months and after a year, self-compassion levels were maintained since the intervention in this study. It is important to note that the increase in

self-compassion was significantly and positively related to the number of days participants meditated and the number of times per day participants informally practiced self-compassion (Neff & Germer, 2012). Therefore, the more one practiced self-compassion meditations or informal practices, the more one saw improvements in their self-compassion levels, and as a result, the more one saw improvements in their well-being. All in all, the mindful self-compassion intervention program is empirically validated to improve mental well-being.

Furthermore, self-compassion interventions have been found to help students improve their overall well-being and increase their resilience in the face of adversity (Smeets et al., 2014). In a sample of 52 female college students, 27 were placed into a self-compassion intervention experimental group and 25 were placed into a time-management control group. Both groups contained three weeks of informational sessions and take-home assignments for their respective groups. The self-compassion intervention was a Neff MSC program that educated students on the different facets of self-compassion. It also had students keep a self-compassion journal and practice self-compassion meditations. The time-management control group met as well but to discuss the importance of managing one's time and how to do so efficiently alongside with related take-home assignments. Variables for mindfulness, life satisfaction, connectedness, optimism, self-compassion, self-efficacy, positive and negative affect, rumination, and worry were measured before and after the interventions. Post-interventions, both groups felt more connected and a higher life satisfaction but the self-compassion group had significantly higher gains in self-compassion, mindfulness, optimism, and self-efficacy alongside a significantly larger decrease in rumination as compared to the time-management control group. This large decrease in rumination signaled better resiliency levels during times of stress, since the less one worryingly reflects on something the better. No between group differences were found for the other

measures. All in all, Smeets et al. 's (2014) findings conclude that self-compassion interventions can improve students' overall well-being and their resilience to hardships.

In regards to a work context, full-time workers' measurements of self-compassion correlated with important organizational outcomes, such as job performance (Reizer, 2019). In fact, a sample of 202 service-sector employees were surveyed on their level of self-compassion, intentions to turnover and leave the company, job performance, organizational citizenship behavior (essentially being a good citizen around the workplace - ie. help others when it is not your responsibility), and emotional exhaustion as variables important to the workplace.

Attachment insecurity was also measured but will not be reviewed here. Those who scored as highly self-compassionate were significantly negatively correlated with turnover intentions and emotional exhaustion and significantly positively correlated with job performance and organizational citizenship behavior. In other words, this study showed that highly self-compassionate individuals are much more likely to have better job performance, be a better "citizen" at work by being more likely to help others when it is not required, and be less likely to want to leave their job and be emotionally exhausted (Reizer, 2019). However, it must be noted that this was just a correlational study of self-compassion scores, not an induced intervention. Regardless, though, it is interesting to see that highly self-compassionate individuals are correlated with better work performance.

Since there is a lot of empirical evidence supporting self-compassion's ability to improve well-being, I decided self-compassion practices would also be ideal to use in my self-study. In particular, I implemented the formal practices of self-compassion meditations and some informal exercises as guided and described by Dr. Kristin Neff on her website:

<https://self-compassion.org/category/exercises/#guided-meditations>. (Neff, 2021). Specifically, sometimes when I would sit down to meditate, I would throw on one of her guided meditations like the “self-compassion/loving-kindness”, “affectionate breathing,” or even the “giving and receiving compassion” meditations (Neff, 2021). Again, these are all meditations that focus on cultivating positive emotions to share with oneself and to “send” to others, like friends or family, in a form of prayerful good-intentions. Additionally, with the meditations, I would mix in the “supportive touch” exercise, like putting my hand on my heart, which honestly has helped me to feel more at ease much quicker during my meditations. Dr. Neff actually describes the “supportive touch” as a way to activate the parasympathetic nervous system “to help us calm down and feel safe,” which I was skeptical of at first but definitely have come to realize its self-soothing ability (Neff, 2021). Especially with 2 hands over the heart, it's like a semi-self hug! But more seriously, it has also helped me to practice being mindful when meditating, especially as the awareness of my heartbeat grows when the drumming-beats are felt by my palms.

Overall, self-compassion has been found to improve mental well-being and is significantly positively associated with better physical health. However, no studies have examined self-compassion and cognitive function. Self-compassion can be practiced through a regular meditation practice just by following Dr. Neff’s guided meditations. As a result, I decided to implement this health habit in my self-study.

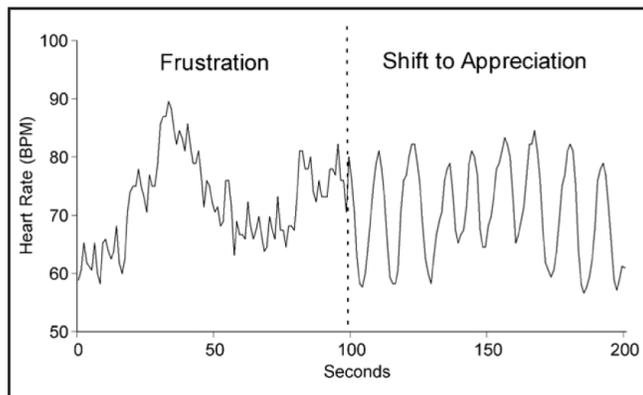
### **Heart Coherence**

Whereas mindfulness meditation explicitly focuses on the fluctuations of the present moment, like the rise and fall of our breath, another technique, heart coherence, focuses on consciously cultivating positive emotions and meditating on them, similar to self-compassion.

The HeartMath Institute, one of the leading research centers on heart coherence, defines heart coherence as “the state when the heart, mind, and emotions are in energetic alignment and cooperation” (HeartMath Institute, 2012). Typically, coherence is understood as consistent connectedness in which the whole is greater than the sum of its parts. In that same spirit, it has been found that the heart, as measured through heart-rate variability (HRV) biofeedback, can become coherent through balanced variations of the heart-beat and that such coherence has positive physical and mental effects. Therefore, with a coherent-healthy heart, one’s mind and body can also become coherent and healthy.

According to empirical science, the primary method to measure personal heart rate coherence is heart-rate variability (McCraty, 2005; McCraty, 2017). Medical devices can measure the heart’s beating impact, defined as the power spectrums, often shown as the highs and lows on heart-beat monitors, which then defines the HRV during the measured time. The defining characteristic of a coherent heart, as measured by HRV in beats-per-minute, is the harmonically-ordered sine-like waves as shown in the “shift to appreciation” part of the referenced figure below (McCraty, 2005). To clarify the figure, it has been found that HRV patterns reflect emotional states with more consistent/coherent HRV rhythms correlating with positive emotions while incoherent/inconsistent HRV rhythms correlating to negative emotions (McCraty et al., 1998). Furthermore, HRV is associated with one’s ability to self-regulate responses, like stress or other emotionally-arousing emotions (Shearer et al., 2016). In fact, HRV’s ability to regulate is measured through high HRV scores, in which higher HRV are understood as more adaptive (Shearer et al., 2016). It may seem contradictory, but higher HRV does not necessarily mean negative healthiness, since it has been found that those with healthy rates of regulation often have higher HRV, have better stress-regulation capabilities thus bringing

down HRV quicker when one does become aroused (Shearer et al., 2016). All in all, our hearts have the capacity to gauge personal coherence, resemble our emotional states, regulate stress better, and even bring us back into emotional healthy-alignment.



**Figure 1.** Shift to coherence. Real-time heart rate variability pattern of an individual using a HeartMath positive emotion refocusing technique (at the dotted line) to shift from a state of frustration to a feeling of appreciation, which is associated with psychophysiological coherence.

(McCraty, 2005)

As HRV can reflect one's emotional state, it is understood that coherent heart states that are represented by positive emotions like appreciation are healthier (McCraty, 2005; McCraty, 2017). A disordered HRV, represented by emotional states like anger or frustration, is associated with other physiological measures that are commonly associated with unhealthiness, such as increased cortisol-stress levels. Similarly, coherent HRV levels displaying positive emotions will show a lack of unhealthy physiological measures, such as cortisol (McCraty et al., 1998). These differences will be displayed in the following studies that are reviewed.

Empirical studies show that heart coherence provides many benefits to our bodies and minds. In fact, researchers found an average 23% reduction of the stress-chemical cortisol on 30 experimental participants who practiced heart coherence techniques (McCraty et al., 1998). Furthermore, a meta-analysis review of 58 heart coherence studies concluded that there is a statistically significant small to moderate effect size ( $g = .4$ ) in physical and mental health improvements, with the largest effect sizes for anxiety, depression, and anger (Lehrer et al.,

2020). Even more, another meta analysis of 24 studies with a total of 484 participants who practiced heart coherence found a significantly large reduction in self-reported stress and anxiety (Goessl et al., 2017). Furthermore, Lehrer et al. (2020) reviewed some studies with cognitive performance and its relationship to heart coherence and suggests there may be an effect, although not as significant with physical and mental health variables. Nonetheless, heart coherent practices and states have been found to improve physical and mental health! As a result, researchers suggest HRV biofeedback practice can work well as a complementary treatment to adverse health problems (ie. Lehrer et al., 2020).

Interestingly, self-compassion, mixed with mindfulness, converges when heart rate variability (HRV) is measured, and thus shows similar heart coherent effects. In fact, a group of highly self-compassionate individuals showed higher HRV levels at rest, compared to individuals with low levels of self-compassion (Luo et al., 2018). When both groups, low and high self-compassion, were given a stress-test, the highly self-compassionate group reported significantly lower negative affect and had significantly higher levels of HRV in response to the stress test as compared to those who were low on the self-compassion scale (Luo et al., 2018). The higher HRV levels in the self-compassion group during the stress test surprised the researchers (Luo et al., 2018). However, it makes sense since highly self-compassionate and mindful people are more connected to their internal state and, in a sense, feel their emotions more. Another study showed similar results, with more complex assessments of HRV, self-compassion, and stress.

A study that conducted brief self-compassion training was found to moderate HRV levels during a stressful speech task, with those in the self-compassion group showing more stabilized HRV levels as compared to a control group and a no condition group (Arch et al., 2014). In fact on the first day of the study, a group of 105 women were broken into 3 groups, a self-compassion

group that listened to recorded self-compassion meditations for 3 days (similar to the ones listed on Dr. Neff's website), an attention (placebo) control group which listened to recorded readings of a psychology textbook for 3 days, and a no intervention control group. After 3 days away from the lab and listening to the meditations, recordings, or nothing, participants returned to the lab for the stressful speech task. Each group was told that the next part of the study would be challenging. As a result, the self-compassion group was guided to listen to another self-compassion recording right before the speech task as well as the attention placebo control group that listened to another psychology textbook recording, the no intervention group was simply told it was going to be challenging.. Before the study, baseline levels of self-compassion, sympathetic nervous system reactivity, and HRV (alongside other variables) were measured. After the stressful mock speech task was conducted, the surveys and physiological recordings were measured again. With regards to between groups significant differences, the major results showed that the self-compassion group had significantly higher self-compassion levels, significantly lower sympathetic nervous system reactivity, and significantly more stable HRV levels as compared to the control groups. In fact, in preparation for the speech task the self-compassion group had a more stabilized HRV level but while giving the speech all groups did not differ in HRV. However, during recovery after the speech task, the self-compassion group showed stable HRV levels while the control groups HRV levels significantly decreased. All in all, Luo et al. (2018) and Arch et al. (2014) are good examples of how heart rate variability physiological feedback can display healthy levels of being, such as self-compassionate individuals having more stabilized HRV levels.

In an academic context, HRV levels have also been found to correlate with school burnout (May et al., 2018). In fact, a 2018 study analyzed the relationship between school

burnout and different physiological measures, one being HRV, in 88 female undergraduate students. After participants took a school burnout survey, physiological measures were taken. The major findings showed that highly rated school burnout responses significantly correlated to low and “very-low” frequencies of HRV. As a result, burnout from school, which is a negative thing, has been shown to be correlated with the negative health measure of a low frequency HRV measure. The researchers of this study conclude that these findings of school burnout associated with heightened negative physiological measures may indirectly convey the evolution of early high-blood pressure and early heart disease (May et al., 2018). This implication is alarming, since I myself sometimes feel burnt out from school; nonetheless, these findings give me more reason to practice these healthy habits, like heart coherence.

Now, you must be asking how does one intentionally get into a heart coherent state? In my understanding, it is very similar to mindfulness meditation and self-compassion, except you add the power of positive thinking while focusing on the area of the heart. Essentially, it is a specific meditation with intentional breathing but with a focus on loving-positive feelings. To reference one heart coherent method, let’s review Heart Math’s “quick coherence technique:” (HeartMath, 2020)

Step 1: Focus your attention in the area of the heart. Imagine your breath is flowing in and out of your heart or chest area, breathing a little slower and deeper than usual. Suggestion: Inhale 5 seconds, exhale 5 seconds (or whatever rhythm is comfortable.)

Step 2: Make a sincere attempt to experience a regenerative feeling such as appreciation or care for someone or something in your life. Suggestion: Try to re-experience the feeling you

have for someone you love, a pet, a special place, an accomplishment, etc. or focus on a feeling of calm or ease (HeartMath, 2020).

This technique is suggested for use when one begins to feel “a draining emotion” such as stress, discouragement, frustration, anxiety, or even anger so that one can apply heart coherent methods right at the moment of incoherent feelings or thoughts (HeartMath, 2020). This is a great way to use this technique, but one can also simply practice this technique as a form of meditation. For however long one desires, which is often 15-20 minutes for me, sit down and meditate by using this technique of intentional breathing with a focus on the heart area and by consciously creating feelings of love, care, appreciation, or whatever positive feeling.

To be honest, when I began using this technique during my meditations I had an existential reflective moment when I asked myself “what moments in my life have I felt deep love?” in an attempt to consciously regenerate that moment to practice heart coherence. That meditation was more of a walk down memory lane, in which I first struggled to identify moments of deep love but then was filled with memories of such appreciative moments. Honestly, every time I meditate I prefer this style of meditation: a heart coherence meditation. Afterward, I always feel much more joyous, much more present, much more connected to myself and others.

### **Overview of Health Habits**

The reviews on yoga and the three different styles of meditation (mindfulness, self-compassion, & heart coherence) summarize the empirical research concluding significant effects in improving mental and physical health. In regards to cognitive functioning, there has been notable empirical research concluding significant improvements like on memory and executive function for yoga and mindful meditation. Key findings are listed below.

Listed here is a summary of some of the mental health improvements for the differing practices. Yoga has been found to help improve depression and anxiety in both clinical and non-clinical populations, improve symptoms of schizophrenia and PTSD, reduce perceived stress, weaken addictions, reduce fatigue and negative affect, increase positive affect and subjective quality of life, and help improve mindfulness, ability to tolerate distress, and positive emotional wellbeing (Woodyard, 2011; Ross & Thomas, 2010; Cramer et al., 2013; Cabral et al., 2011; Pascoe et al., 2017; Hartfiel et al., 2012; Harris et al., 2015). Mindfulness meditation helps to improve, of course, mindfulness, but also subjective well-being, reduce anxiety and depression in clinical and non-clinical populations, lessen emotional reactivity, improve behavioral regulation and positive emotional responsiveness, increase one's accepting attitude and self-compassion, improve mental health issues like depression, better emotional regulation and processing, improve the quality of relationships with others, reduce mental biases and stress, and improve work engagement by increasing recovery level (Keng et al., 2011; Tomlinson et al., 2018; Smith et al., 2017; Jazaieri, 2017; Goya et al., 2014; Hofmann et al., 2010; Eberth & Sedlmeier, 2012; Liu et al., 2020). Self-compassion meditation has been found to improve and correlate highly with one's level of self-compassion, overall well-being, life satisfaction, happiness, mindfulness, connectedness, increased resilience, self-improvement motivation, high job performance, and organizational citizenship behavior, and is also negatively correlated with depression, anxiety, and stress (Zessin et al., 2015; Macbeth & Gumley, 2012; Neff & Germer, 2012; Smeets et al., 2014; Reizer, 2019; Breines & Chen, 2012). Heart coherence meditation has been found to correlate with a healthy heart rate variability (HRV) which is signified in studies as a coherent HRV or even heightened HRV levels; healthy HRV levels have been found to correlate with improved stress management, self-compassion levels, negative affect, anxiety,

depression, and anger (McCraty et al., 1998; Goessel et al., 2017; Luo et al., 2018; Arch et al., 2014; Lehrer et al., 2020).

Listed here is a summary of the physical health improvements for the differing practices. Yoga helps to alleviate lower back pain, neck pain, helps against arthritis, improves sleep, strengthens muscle, lessens the body's stress-response of the sympathetic nervous system which leads to reducing blood pressure, heart rate, cholesterol, and other physiological measures associated with common comorbidities, and reduces cortisol (Woodyard, 2011; Ross & Thomas, 2010; Cramer et al., 2013; Pascoe et al., 2017; Hartfiel et al., 2012). There is some evidence that mindfulness helps to decrease the body's stress response, improve immune function, lower inflammation, and increase serotonin, the happiness hormone (Ngo, 2013). Self-compassion meditation has been found to improve one's level of self-compassion, and high levels of self-compassion correlated significantly to healthier behavior in general (Phillips & Hine, 2021). Heart coherence meditation, often correlated to healthy heart rate variability, has been found to reduce cortisol and sympathetic nervous system activity (McCraty et al., 1998; Arch et al., 2014).

Listed here is a summary of the cognitive health improvements for yoga and mindfulness meditation; the other habits are not included since I was unable to find any cognitive studies for the two other meditation styles. Practicing yoga long-term helps to improve attention and processing speeds and enhances executive function, like planning, initiating, ordering, and observing elaborate and goal-directed behavior (Gothe & McAuley, 2015). Immediately after practicing yoga, cognitive functions, like memory, attention and processing speeds, and executive function, have been found to significantly improve (Gothe & McAuley, 2015). Mindfulness has been found to improve executive functions like response to stress, attention

regulation, ability to focus, and even reduces distractive mind-wandering (Smith et al., 2017; Eberth & Sedlmeier, 2012).

All in all, the mental, physical, and cognitive health benefits of yoga and meditation give reason as to why one should practice them. At least for me, reviewing these health practices and their benefits has motivated me to actively practice them.

### Self-Study

I wanted to see how implementing these health practices in my daily life would affect my own sense of anxiety, stress, and mindfulness (and later, self-compassion). Before even beginning the research and writing of this thesis, I was already using mindfulness meditation throughout my life, since I somewhat knew about its health benefits. However, I did not start taking it seriously with different styles of meditations until this thesis. So, I tried to take it seriously and “empirically assess” any changes in personal stress, anxiety, and mindfulness (and later, self-compassion) with the different styles of meditation and yoga. However, I must note that in the first semester of this thesis project, I originally planned to practice some similar and different health habits.

In the fall semester, I initially chose 5 habits, some that were reviewed in this thesis and some that were not. They specifically were Wim Hof breathing, mindfulness meditation, yoga, heart coherence meditation, and nature therapy. All of these have some empirical studies validating its benefits on health (Appendix A). Some have already been reviewed in this thesis but for those that were not, a list of resources summarizing its benefits can be found in Appendix A. To be clear, I initially chose those 5 habits to practice throughout the year, since I already heard about some of their benefits. I planned to implement them in “waves,” where the first “wave” consisted of 5 weeks, with 1 habit a week (ie. mindfulness during week 1, yoga during

week 2, etc.). I completed the first wave of implementing the habits alongside taking survey measures to assess some mental health variables (which will be explained shortly). I initially planned that there would be 3 waves of implementation in total but as I tried to start the second wave late in the first semester I realized it was too much to handle with work and school things piling up. So, I decided to wait until the semester was over. Winter break commenced and so I tried to start with a three-week plan to do all five habits every day. That plan failed, so I tried to lessen the habits. I did successfully lessen the health habits I would practice, specifically into the ones that were reviewed in this thesis. I thought it was best if I kept the habits simple by making them all similar. So, a mix of yoga and meditation it was.

Yoga, heart coherence meditation, and mindfulness meditation were chosen for the list, but self-compassion was something added last minute. One day, while listening to a podcast, I heard of Dr. Neff and her self-compassion research and how it relates to meditation. I decided to look more deeply into her research, visited her website, loved what I read, practiced one of her meditations from the site, and then was determined on adding it to the thesis. Despite the fact self-compassion meditations are similar to heart coherence meditations, because of the conscious cultivation of positive emotions, I was committed to keeping them both in the thesis because of the effective results of experienced joy, love, and appreciation I would feel during and after those practices. All in all, the second wave of implementing health habits consisted of 3 weeks every day practicing the three different types of meditation and yoga practice.

In regards to the structure of implementing these habits for both waves, my aim was to originally practice them for an hour but then changed to at least 20 minutes a day. For example, in the first wave of implementation, the week's habit, like nature therapy, I would go out and walk at the park for 20 minutes or if the week was yoga, I would practice yoga for at least 20

minutes. In the second wave of implementation, I would practice each habit for 20 minutes a day, for a total of an hour and 20 minutes a day with an hour of meditating and 20 minutes of yoga. However, I remember slipping up some days and missing some practices, but I know I made myself practice at least one meditation for 20 minutes a day. Nonetheless, the implementation of the habits was inconsistent, but I did try!

To further detail how I understood and practiced the habits, here are brief summaries. For mindfulness meditation, I would set a 20-minute alarm and focus on the rise and fall of my breath, or focus on the beating of my heart (sometimes with increased focus by putting my finger tips together and feeling the extent of the pulsating there too), or focus on some physical object; essentially I would describe it as an open-monitoring practice of my senses, and when thoughts would arise I would gently bring my attention back to the focus of attention. With heart coherence, I would set a 20-minute alarm and focus, again, on the in-and-out breath near the heart area with the main practice of consciously cultivating positive feelings of appreciation, love, joy, gratitude, etc. (often by remembering moments I felt deep positive feelings - ie. remembering the time my grandma and I hugged and embraced each other on her birthday, felt grand feelings of joy and love and helps to remember since my mom took pictures of that moment). In regards to self-compassion, I would put one of Dr. Neff's guided meditations on, which usually lasts around 20 minutes, guiding oneself to be compassionate and appreciative of oneself and meditatively sharing those feelings with others. Same with yoga, I would often put a guided yoga video from Youtube ranging from 15-20 minutes, and other times I would just put an alarm on and flow through yoga positions for like a minute each, or at least tried. With the two other habits from the first semester, I would put the same 10-minute guided wim hof

breathing session from youtube, which ranked up about 21 million views thus far (Wim Hof, 2019), and go out for a walk at a nearby park for nature therapy.

I hypothesized that my mindfulness would increase while my anxiety and stress levels would decrease as a result of practicing these different health habits for both semesters. In regards to the second semester, I also hypothesized that my self-compassion levels would increase. To “assess” any potential changes, I used the mindfulness awareness attention scale (MAAS), state and trait anxiety inventory (STAI), and the perceived stress scale (PSS) for both waves of health habit implementations. I also added the self-compassion scale (SCS) for the second wave of implementation, which I describe below. Throughout both waves of implementation, I took the surveys once, right before I started a wave, then would take the surveys a week directly after that day. During the first and second waves, I took the surveys on a Sunday before I started the habits then took the surveys again every week on a Sunday. After a wave of implementing the habits was completed, I then took another survey on a Sunday signaling post-treatment measures. My main plan was to examine the differences in scores from before I practiced the habits to after, but it was also useful for me to analyze my scores throughout the intervention.

### **Survey Measurements**

The Mindfulness Awareness Attention Scale (MAAS) is a self-report scale measuring mindfulness. As a reminder, mindfulness or being mindful is a mental state of non-judgemental awareness that simply perceives what is going on in the present moment. Mindfulness and its benefits on psychological well-being is the reason why I am utilizing this practice and survey (e.g. Eberth & Sedlmeier, 2012; see review). The MAAS survey scale has been empirically

validated amongst many groups such as cancer patients and in the Brazilian culture, making it a generalizable survey (Carlson & Brown, 2005; Barros et al., 2015). I used the MAAS scale to assess any changes in my state of non-judgemental present awareness as I practice the health habits, specifically as I predicted an improvement in mindfulness.

The State-Trait Anxiety Inventory (STAI) is a self-report scale measuring anxiety, both in its state and trait forms. Specifically, state anxiety represents temporary anxiety experienced in specific moments whereas trait anxiety is understood as the long-standing characteristic of a person (Spielberger et al., 1983). The STAI survey is often used in clinical practice to distinguish between anxiety and depression symptoms (APA, 2011). Furthermore, the STAI scale has been empirically validated and is reliable in use within American college students, Malaysian urology patients, and many more groups (Metzger, 1976; Quek et al., 2004). I used the STAI scale to assess fluctuations in my anxiety as I practice the health habits, in which I hypothesized a decrease in anxiety for both my state and trait anxiety. I took one measure of my trait/long-standing character anxiety before the first wave of implementation then took them consistently every week during and once after the second wave of implementation. In regards to state anxiety, I took those surveys weekly during the waves of implementation.

The Perceived Stress Scale (PSS) is a self-report tool measuring perceived stress. The questions ask how “unpredictable, uncontrollable, and overloaded respondents find their lives” in accordance with the characteristic of stress (Cohen et al., 2014; Cohen, 1983). Specifically, questions are gaged on stress for the last month within the PSS. However, I answered the PSS survey for perceived stress throughout the last week when I took them during the waves. There is empirical evidence justifying the PSS’s validity and reliability in many groups; for example, undergraduates from the United States and China (Cohen, 1983; Lu et al., 2017). In fact, high

perceived stress scores have been found to correlate with failure to quit smoking, failure among diabetics to control blood sugar levels, greater vulnerability to stressful life events which elicited depressive symptoms, and more colds; all of which shows a clear relationship with stress and unhealthiness (Cohen, 1983). I used the PSS to analyze my perceived stress throughout the waves of implementation, in which I hypothesized a decrease in perceived stress.

The Self-Compassion Scale (SCS) is a self-report measure that analyzes self-compassion (Neff, 2003). The questions prompt one's level of self-compassion, which, to remind us, involves a loving-accepting attitude with one's self-talk, especially when negative emotions rise up, understanding that we are not alone in our experiences, remembering that all humans feel similar ways, both good and bad, and to be mindful of negative thoughts as opposed to suppressing or overly-identifying with them (Neff, 2021). There are many empirical studies using the SCS, in English and even many other languages for different cultures, therefore justifying its validity, reliability, and generalizability (Neff, 2021). Dr. Neff notes how high self-compassion levels correlate with positive mental health, like an enhanced quality of life or even life satisfaction, and negatively correlates with depression, anxiety, and the like (Neff, 2012). I used the SCS to analyze my own levels of self-compassion throughout this self-study, in which I hypothesized improvements as I practiced the health habits.

## **Results**

### **Wave 1 (9/29 - 11/8)**

Throughout my first wave of implementing the health habits (mindfulness meditation, wim hof breathing, nature therapy, yoga, & heart coherence meditation), there were barely any improvements according to the data. Throughout this wave, I took the surveys on the Sunday of each week, noting the beginning of another week. As we can see in Figures 1.1 and 1.2, I started

off decently mentally “healthy” with no/low stress and no/low state-anxiety as well as a moderate level of mindfulness (3.53). In the middle of week 2, you can see a spike in perceived stress and state anxiety levels as well as a dip in mindfulness scores. To clarify these data points, that was when I had that radical disruption as a result of getting hit by a car while skating to work, which forced me to postpone a lot of my school and work responsibilities and take care of expenses and health issues. In regards to the surveys themselves after the accident, I measured out to be moderately stressed, only 3 points under the high-stress level, alongside a high level of state-anxiety, and then maintained the low level of mindfulness at 3.3. The low level of mindfulness at 3.3 consistently stayed the same from week 1 to week 3, and I speculate this occurred because as school and workload increased, my mindfulness levels decreased. To be fair, when I sat down for meditations, it was hard for me to let go of school and work stresses and be fully present. After the week of the accident and as I got a better grasp of life stressors from medical expenses, physical therapy treatment, school, and work I returned to my baseline state of stress. Additionally, my state anxiety decreased, but at week 4, the last time I tracked surveys for this wave of implementation, it began going up again. Also at week 4, my mindfulness levels began to increase. Therefore, as I continuously practiced the habits, the later data began to show improvements.

Figure1.1

### Wave 1 (9/29 - 11/8)

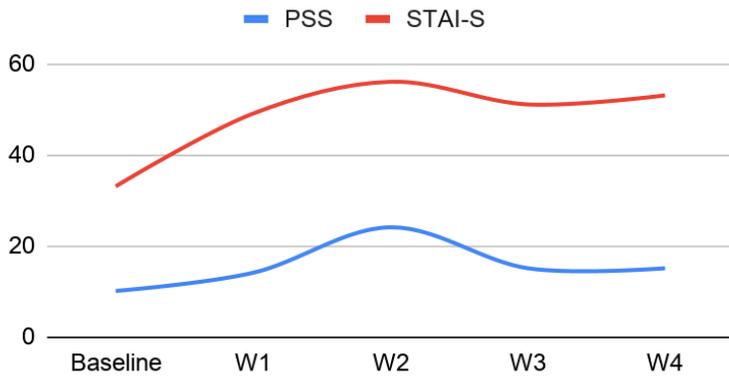
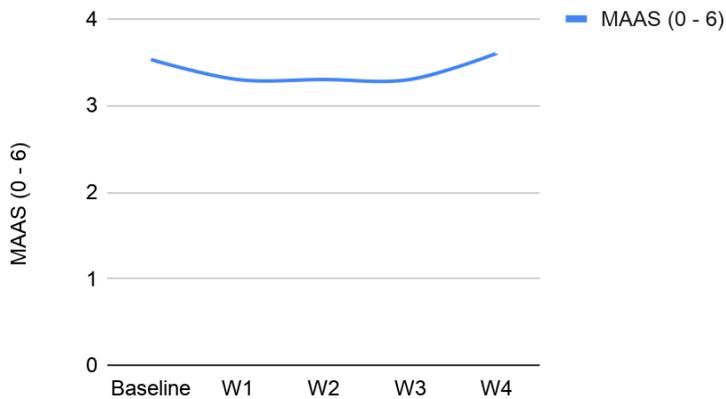


Figure 1.2



### Wave 2 (1/21 - 2/4)

The second wave of implementing health habits consisted of 2 weeks of practicing yoga and the 3 different types of meditation reviewed: mindfulness, heart-coherence, and self-compassion. Similar to wave 1, I tracked perceived stress, state anxiety, and mindfulness, but this time I also tracked trait anxiety through the State-Trait Anxiety Inventory (STAI) and self-compassion through the self-compassion scale. Visuals of the data and the fluctuation of measures are found in Figure 2.1 and 2.2 below. At baseline, I experienced moderate stress with high levels of state and trait anxiety, perhaps because winter break was ending and my last

semester was starting, meaning I had to figure out how to complete all remaining school projects in order to graduate, like this thesis. Additionally, as I distinctly remember feeling disappointed at myself for not getting enough done during winter break, I reported low self-compassion rates and low mindfulness. As a week passed and I began to get more progress on projects and built up my confidence that my projects can and will be done, my levels of stress and anxiety went down while levels of mindfulness and self-compassion shot up significantly. In fact, I measured out with low stress, moderate state anxiety, moderate self-compassion and mindfulness, and lower trait-anxiety, but still measured out to have high-trait anxiety. At the end of my survey assessments at week 2, school started up and my stress and anxiety measures went back up, specifically with high levels of state and trait anxiety, and raised stress, but still signified as low-stress. Despite increases in negative mental health states, my mindfulness and self-compassion levels continued to increase, but not as significant as the previous week. As I continued to practice the habits and strengthened my self-compassion skills (ie. more loving self-talk as opposed to extreme self-criticism), I measured out to be moderate in self-compassion and higher in mindfulness, at 4.13.

Figure 2.1

### Wave 2 (1/21 - 2/4)

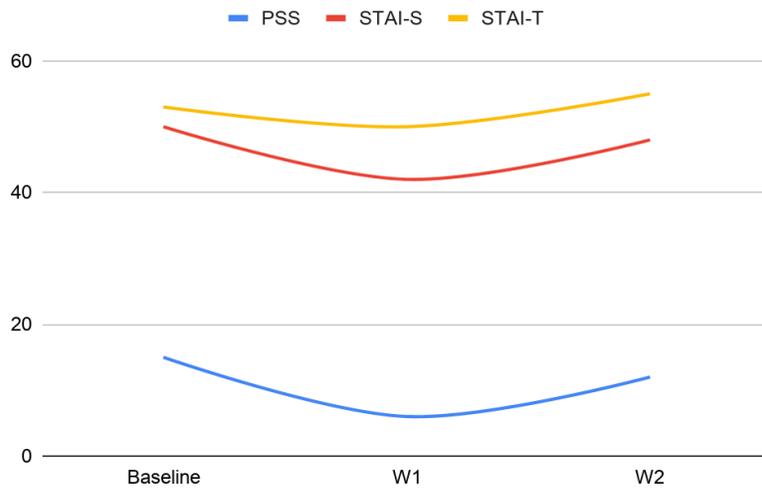
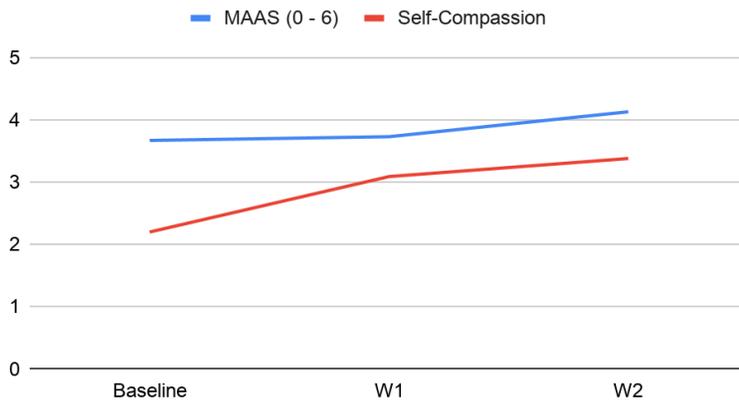


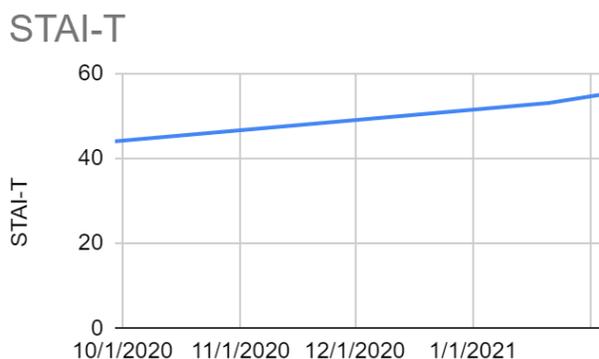
Figure 2.2



### STAI-T from Wave 1 to Wave 2

Since I only tracked my trait anxiety (STAI-T) at baseline for the first wave of implementation and tracked it throughout for the second, I thought it would make more sense to compare and contrast my trait anxiety levels from before the first wave of implementation and after the second wave. The results displayed in Figure 3 show that I have increased trait anxiety. In other words, my anxious character has worsened.

Figure 3



### **Reflection on Implementing Habits**

My relationship with implementing health habits swayed to and from feeling like a chore and feeling like a mental break from school and work. The health habit implementation strategy was built to help me take breaks from the college stresses, which I would say helped. But sometimes, just implementing the habits sometimes felt forced and like another thing on my to-do list, especially when I was mentally stressing about school and work projects. Nonetheless, though, I felt like I grew in going deeper into some of the habits, especially so for the wim hof breathing method.

The guided wim hof breathing method on YouTube linked in Appendix A is characterized by 30 intense full in and out breaths then a full out-breath which then the empty breath was held for up to 1 minute and 30 seconds then after took a deep breath in and held for about 10-15 seconds then did that for 3 sets. Honestly, holding an empty breath for so long was initially difficult but as I practiced I was able to build fortitude to last up to a minute and 30 seconds. With this practice, alongside my mindfulness practice, I would feel my body switch from the stressed-out sympathetic nervous system to the relaxed parasympathetic nervous system as my shoulders, forehead, jaw, and mental clutter would relax and clear out. But, specifically to wim hof, as I practiced the empty breath holds and intense in-breath afterward, I would feel like

relaxing tingling sensations shoot throughout my body with ringing in my ears. I thought at first that I almost made myself pass out, but it felt weirdly relaxing.

In regards to nature therapy, research references in Appendix A discuss that simply walking outside helps to relieve stress and improve health. Whenever I went out to walk at the nature park or anywhere outside, my goal was to just walk around and get my mind off school/work things. However, as I continued this practice and one day hiked the nature park for a couple of hours, I became aware of the reciprocal relationship we share with trees. We breathe in their oxygen, which nourishes us, and we breathe out carbon which then is breathed in by the trees and nourishes them. This insight does not necessarily tie into the nature therapy research on physical/mental health but it did help me to realize the love we share with nature.

In regards to yoga during the first wave, I simply would put on a 20 minute guided yoga session from youtube. I did it for 1 week and I remember it initially felt more like a workout trying to hold still in positions. I definitely failed to hold still and got frustrated, but that was when I realized the mindful aspect of yoga. As I would struggle to maintain postures, I realized that struggle felt similar to the struggle I feel during mindfulness meditations as I wrestled with detaching and being present.

Yoga during the second wave, though, I would say I grew in the way I flowed and practiced with yoga. Half the time I would put on a guided yoga session and the other half I would put 20 minutes on the clock and just flow through postures, aiming to hold certain postures for a couple of minutes. With the insight from the first wave, I came at practicing yoga with a more mindful approach, recognizing that the struggle is much like a mindful struggle. As I practiced most days in the second wave, I felt like I struggled less and less when holding

postures and felt heightened senses of accomplishment and mindfulness. I did, indeed, feel less stressed and more relaxed after practicing.

In regards to mindfulness meditation during both semesters, I had my ups and downs. Whenever I was in a mental rut of stress as a result of school and work, it was harder for me to sit down and be present. But, when I was not stressing with school and work, typically after finishing major projects, it felt easy to be relieved and be present. Outside of the actual meditation practice, I became aware of my growing awareness of negative thought tendencies and even moments when I was not mindful, like spilling things.

With regards to heart coherence meditation, I remember a distinct change from the first to the second wave of implementation. During the first wave, I would meditate and consciously raise up things I was grateful about, like having an education, a job, loving family and friends. I would say it helped to grow more appreciative of the blessings in life, especially so since after my accident. But, during the second wave, I meditated on similar appreciative moments but discovered the power of consciously remembering memories of great love and appreciation. The memory when my Grandma and I took a picture, embracing, cheesing, and laughing together played throughout my head when I would sit down to practice heart coherence and prayerfully tell her I miss her and love her. I would leave those meditations full of joy, appreciation, and nostalgia for my Grandma, which then radiated when I interacted with others.

Self-compassion meditations not only helped me to feel more joyous and positive but also led me to be aware of how I talk to myself. The “may I’s” (ie. be kind, peaceful, accept myself, etc.) during meditations especially led me to be more kind and compassionate with how I talk to myself. It initially felt weird to me to talk to myself like that, but then I realized that it was helping especially as I caught myself being extremely self-critical. I was disappointed in myself,

thinking I was inadequate, for not getting closer to being done with my thesis during winter break. I found myself thinking I could never finish, then, as I grew aware of this critical-demeaning self-talk by practicing self-compassion meditations, I was able to stop it and reshape my self-talk by growing to believe that I could finish, it was indeed possible, as long as I was patient and consistent. The “may I’s,” even though cheesy, did help me to actually believe in myself. Furthermore, I appreciate the hand over heart exercise in times of distress and just in general during meditations because I felt more present as I sensed the beat of my heart on my hand. Lastly, the guided self-compassion meditations listed on Dr. Neff’s website were great as they coupled the self-compassion exercises with meditation.

All in all, I felt as if I grew with the habits I was practicing, not only grew in appreciation for it, but came to deeper insights as I practiced them more often. Moving forward after the thesis, I do know I will keep a meditation practice consistent and will intertwine yoga at least once a week into my regular workout routine. Furthermore, I definitely plan to grow in appreciation and loving awareness of life and its blessings, like my loving friends and family or the love trees and humans share with each other by providing each other breath.

### **Further Reflection/Discussion of Results**

To be honest, I was expecting radical improvements in the way I hold myself up as a result of these practices. But also, I must recognize that my practice was not radically instilled in my life, hence the lack of radical results. Instead of the ideal goal of practicing at least an hour or so a day, I barely made out with 20 minutes a day. Across both waves of implementing the habits, there is barely any evidence of improvement across mindfulness, anxiety, or stress, other than the self-compassion measures.

I would attest that I have grown to be more compassionate in the ways I talk to myself. Initially, when I started I was very stressed about trying to finish this thesis, and was feeling very inadequate, but the self-compassion meditations definitely helped me to recenter myself, believe that I can get it done, and all in all, just helped in the way I talked to myself. As opposed to thinking, “oh, I’ll never get this done,” I began to think “I can definitely do this, just more time and effort and we got this.” This growth of mind can be represented through the improvements in self-compassion scores.

I’m not entirely sure if I would say I am more mindful, because I’m still a clutz sometimes, spilling or dropping things. However, in regards to thought tendencies, I would say I am much more mindful of negative thoughts when they come up. For example, I used to think I was not good enough when comparing myself to others and now whenever I begin to compare myself to others I recognize it, stop the self-critical talk, and rather consciously acknowledge my admiration for the other and use it as self-motivational talk, like “I recognize I admire person X for thing Y, let’s further explore my interest in thing Y.” During my regular day-to-day, I have found myself being more generally positive, even during stressful situations. Instead of having cried out, “oh why me,” in certain situations I found myself being more neutral, detached from any negative feelings and rather looking at things more objectively. Furthermore, and perhaps most importantly for me, is my new general sense of ease and tranquility when I actively have a daily meditation practice. As opposed to feeling insecure in certain situations, I rather feel comfortable in my own shoes and confident with where I am at in that moment. However, the mindfulness empirical data does not show this, I do attest to this change in perspective as I navigate the world.

In regards to anxiety and stress, the data shows it has at least been maintained or gotten worse. Personally, I do not see a change in my anxiety and stress levels. However, I would agree they do seem to be the same as they were before, I am still a pretty stressed out anxious person. But, if I want more radical results I need to be ready to take radical action, and that is what I am hoping for in the future.

Despite only minor to moderate improvements in mindfulness and self-compassion levels and a maintenance of stress and anxiety levels, I want to make clear that this was simply a self-study and therefore validity and reliability of these results are slim to none. Rather, we should recall the many meta-analyses conducted on the health habits and remember they have been empirically validated and reliable to entrust that these health habits work to improve overall well-being, mental health, physical health, and even cognitive functions. Furthermore, it is important to note that the mindful programs usually lasted 8 weeks with an average of 20-27 hours practice in total with about 3 hours of practice a week, whereas my practices probably added up to only about 2 hours a week. Case in point, I need to instill these practices more into my life if I want to see better improvements. However without the data, I personally still attest to the health habits' ability to help improve mental health, improve cognitive ability, and enlighten one's perspective of life, at least in my own life. I know I will continue to implement these habits in my life as it helps me. Likewise, I hope these practices can be implemented more widely to help those who suffer from chronic mental health issues, especially now as depression, anxiety, stress, and suicide levels are at alarming rates.

### **So What?**

Poor mental health rates have significantly worsened throughout the past year as a result of the COVID-19 outbreak (e.g., Czeisler et al., 2020; Palsson et al., 2020), especially as folks

socially distanced and isolated to protect themselves against the virus. Virtual (almost) everything, including school, work, and even health appointments, have forced people online and away from the everyday social connections. With this pandemic, many people have lost their jobs, or at least experienced a significant reduction in their income (Palsson et al., 2020), maybe even lost loved ones due to COVID, or just had diminished immune levels which increases risk for mortality because of loneliness from social isolation (Holt-Lunstad et al., 2015). As a result of the pandemic and its adverse effects on people's lives, many have experienced heightened levels of stress, anxiety, depression, and even suicidal thoughts (see CDC & UNC studies below).

After alarming rates of mental health decline were found by the Center for Disease Control and Prevention (CDC), they called for an increase in intervention and prevention to address negative mental health conditions (Czeisler et al., 2020). It is my hope that the health habits I have outlined may help in the CDC's call-to-action to increase intervention and prevention efforts so that individuals and communities may learn how to heal and nourish their mental health. After reviewing mental health research, both in response to COVID and in general, I will note how mindfulness intervention studies have been shown to be an effective way to combat declining mental health, especially in work and school environments. Lastly, I will describe how mindfulness is already being implemented in work and school environments today. However, I will end off on my vision of how mindfulness can be more integrated into the culture and therefore have more effective results in addressing the CDC's call-to-action.

In mid-2020, two major research reports on the COVID-19 pandemic were released informing the emotional wellbeing of U.S citizens. One was the *U.S National Pandemic Emotional Impact Report* by the University of North Carolina (UNC) and the Harvard Medical

school that surveyed 1,500 U.S adults in May 2020 (Palsson et al., 2020). The other was a CDC weekly report on *Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 Pandemic* that surveyed 5,412 U.S adults in July 2020 (Czeisler et al., 2020). In summary, both studies found that U.S adults are experiencing significant levels of poor mental health during the COVID-19 pandemic, specifically in mid-2020.

Let's jump into some of their findings. The CDC found that 40% of participants -- therefore, almost half the U.S population if their sample was representative -- reported wrestling with mental health or substance use during COVID in 2020, (Czeisler et al., 2020). To make matters worse, the UNC and Harvard report found that 38.3% of U.S households experienced job-loss or had a significant reduction in their income during COVID in 2020 (Palsson et al., 2020). The fact that almost half of U.S adults, anyone above the age of 18, is experiencing major negative health issues and/or started an increase in their substance use to cope is alarming. It unfortunately makes sense though since a significant amount of U.S adults lost their jobs and/or are experiencing major cuts in their incomes. Furthermore, the CDC reported that the frequency of symptoms for anxiety and depression disorder in mid-2020 were about 3 to 4 times worse than in 2019, respectively (Czeisler et al., 2020). Plus, the UNC and Harvard report found that participants with high levels of pandemic distress are 20 to 40 times more likely to have clinically significant levels of anxiety and depression, respectively (Palsson et al., 2020). It goes to show that a global pandemic is a recipe for poor mental health. Furthermore, in differentiating by age, gender, race/ethnicity, region, education, essential workers, and unpaid adult caregivers, the researchers found even more alarming results. In the CDC study, at least one major mental or behavioral health symptom was reported for a significant proportion of certain groups, such as 74.9% of adults age 18-24, 51.9% of adults age 25-44, 52.1% of Hispanics, 44.2% of Blacks,

54% of essential workers, 66.6% of unpaid caregivers, 72.7% and 68.8% of individuals diagnosed with anxiety and depression, respectively, and 88.0% of those diagnosed with post-traumatic stress disorder (PTSD) (Czeisler et al., 2020, p. 2). The CDC researchers concluded that “mental health conditions are disproportionately affecting specific populations, especially young adults, Hispanic persons, Black persons, essential workers, unpaid caregivers for adults, and those receiving treatment for preexisting psychiatric conditions” (Czeisler et al., 2020, p. 3). Furthermore, the UNC and Harvard report found that Hispanics and Blacks had higher pandemic distress index scores on average when compared to Whites (Palsson et al., 2020). This research shows that even amidst a global pandemic, conditions like mental health are still worse for under-resourced groups, as opposed to privileged groups.

Personally, the most alarming finding of these reports is the CDC result showing that 1 in 4 people (25.5%), aged 18-24 seriously considered committing suicide (Czeisler et al., 2020). This is very disheartening and even scary to think that friends around me in my age group may be thinking of suicide. And, who knows who is feeling suicidal at any given moment? Hence, more reason to be kind and compassionate to others -- even if it is a kind “good day” gesture to others at the grocery store, of course with 6-feet apart -- because you never know what they may be going through. Just as the CDC recommends, there should be more public health intervention and prevention efforts to fight against negative mental health conditions, especially for suicidal ideation (Czeisler et al., 2020).

How can there be adequate public health intervention and prevention efforts to ensure that citizens are being given the right tools and information to nourish their health? Well, the common citizen spends the majority of their time either in work or at school, and students and full-time workers are often plagued with anxiety and stress. How about we start there and teach

mental health-nourishing habits, like the ones we reviewed (ie. yoga, mindfulness meditation, heart coherence, or self-compassion)? Luckily, there already have been health programs tested in work and school settings showing significant improvements.

Work-related stress is significantly prevalent amongst U.S workers and is one of the main reasons why people miss work. According to an Everest College survey of 1,019 working U.S adults, 83% reported being stressed out at work and often cited low wages with high amounts of workload as the biggest stressors (Corinthian Colleges Inc., 2013). Furthermore, an American Psychological Association 2017 survey found that work is the third most common cause of stress for Americans (APA, 2017). From a business perspective, U.S businesses lose about \$30 billion a year in lost workdays as a result of work-related stress, which is a pretty hefty number (Pazzanese, 2016). But, of course, what matters more is the people's health, which is also true for those in college.

In regards to college-age students, anxiety and depression were found to be the most common mental health issues, especially during COVID (Eisenberg et al., 2020). A mental health survey of 32,754 students was administered during the 2020 fall semester, in the middle of the COVID pandemic (Eisenberg et al., 2020). 39% of the sample screened to have depression, whether moderate or major depression, while 34% screened to have an anxiety disorder (Eisenberg et al., 2020). Two-thirds of the sample stated they felt left out and isolated from others while more than 80% of the sample stated that mental/emotional difficulties have negatively affected their academic performance (Eisenberg et al., 2020). Furthermore, this study sheds light on how mental health is still negatively stigmatized as 45% of the sample agreed with the statement that "Most people would think less of someone who has received mental health treatment" (Eisenberg et al., 2020, p.3). When it comes to stress, the APA's 2020 review of Stress

in America found that 90% of adults ages 18 to 23, essentially college students, reported education as a significant source of stress (APA, 2020). I would agree. Overall, though, data on college students' mental health and stress during COVID-19 shows significant and alarming rates in mental health and stress, which is also negatively impacting academic performance.

Given these alarming statistics and the amount of time spent in these contexts, work and school environments are prime areas to begin teaching and encouraging mental health-nourishing habits. Luckily, there have been intervention programs that focus on studying the effects of some of the health habits reviewed for both school and work settings already. Some studies have already been reviewed earlier in the thesis, like Harris et al. (2015) (reviewed in the yoga section) who showed that a yoga and mindfulness intervention can help teachers tolerate considerably more distress, feel as if they are managing the classroom more efficiently, and report more positive emotional well being as opposed to teachers who did not partake in these programs (Harris et al., 2015). Students can also benefit from such programs, as Shearer et al. shows in her study below.

Shearer et al. (2016) studied the effects of a mindfulness intervention on students and found significant improvements on stress, showing that these sorts of trainings can ultimately help to improve stress management for college students. There were a total of 74 college student participants, with 3 randomly assigned groups: a mindfulness meditation group, a group where students got to hang out and “de-stress” with dogs, and a no-treatment group (Shearer et al., 2016, p. 6). Before the interventions began, each participant completed a survey measuring mood, trait mindfulness, and demographic information (Shearer et al., 2016). There were four one-hour weekly group sessions for the two treatment groups, and every participant filled out a set of survey measures during each session, testing anxiety, positive and negative affect,

depressive symptoms, and mindfulness. Those survey measures were also completed after the interventions. After the 4-week program, all participants completed a post-treatment test that imitated typical stressors that a college student would experience and during the test researchers measured their heart-rate variability (HRV) (Shearer et al., 2016). As a reminder, HRV is used as a physiological measure to assess one's ability to stress-manage, in which low HRV levels signal stressful-states and high and coherent HRV levels signal relaxed-states (Shearer et al., 2016).

Shearer et al.'s (2016) research results show that those in the mindfulness intervention improved significantly on anxiety and negative affect measures, as well as showing a better stress-management response as measured by the HRV levels. The specific results of the research shows that before treatments, there were no significant differences in any measures for any group. During and after treatment interventions, there were significant differences. The mindfulness group showed the most significant reduction in state anxiety after the third and fourth mindfulness class, while similar but smaller effects were also found for the de-stress with a dog group (Shearer et al., 2016). Negative effects were also significantly decreased in both treatment groups but not the control group. Additionally, the mindfulness group was shown to have the highest HRV than the two other groups, implying that mindfulness helped to regulate stress the best. However, the researchers described it as "odd" that the mindfulness group did not lead to increases in self-reported mindfulness, despite a significant improvement in HRV, anxiety, and negative affect; perhaps it is because, as I noticed in my own self study, if one starts a mindfulness practice, one could begin to recognize how much they really are not mindful (Shearer et al., 2016, p. 16). Shearer et al. (2016) suggests that it would have been better to measure their levels of self-compassion, since previous research has found that it is a more effective predictor for symptoms of anxiety and depression as well as a reliable correlate for

quality of life and well-being as compared to a measure of mindfulness (Shearer et al., 2016). Hence, more reason to use the self-compassion scale but also use self-compassion in one's life! All in all, though, Shearer et al. (2016) found that mindfulness meditation does indeed help students manage stress better, decrease their anxiety, reduce negative affect, and is all correlated with healthier HRV levels. Therefore, Shearer et al.'s (2016) research gives empirical reason as to why mindfulness meditation programs should be more common in schools.

Similar results were found in a 2011 randomized-control study that organized a meditation-intervention for full-time workers (Manocha et al., p. 2011). In particular, 178 adult full-time workers participated in an 8-week program broken into 3 groups: 1. Meditation group, 2. Relaxation active control group, and 3. Wait-list no-treatment control group. Work-stress, anxiety, and depression were all assessed, and significant improvements were found in the meditation group compared to both controls, especially for work stress and depressive feelings. The researchers concluded that meditation, specifically mental-silence meditation (the one used in the study aims at 'thoughtless awareness' through explicit focus of the present moment, similar to mindfulness), is an easy and effective tool to address work-stress and depressive emotions (Manocha et al., 2011). Hence, Maconacha et al.'s (2011) study gives reason as to why meditation programs should be more common in work settings.

As mindfulness intervention studies have shown to address the alarming rates of mental health and stress, mindfulness programs, like apps or interventions at schools and at work, are helping to popularize the practice of health habits. On one hand, workplace mindful programs are typically promoted through apps. On the other hand, schools typically have mindfulness practiced through add-on programs (ie. after-school activity).

Examples of meditation being used in the workplace include apps like Headspace or Calm, that offer guided meditations (Calm, 2021; Headspace, 2021). A part of these apps' business model is to consult with big corporations and sell them packages to learn, practice, and encourage mindfulness. In fact, Headspace has partnered with General Mills, Adobe, Roche, and many other companies to promote well-being for their employees, referencing scientific evidence for “less stress, more focus, and easier teamwork” as benefits (Headspace, 2021). A perfect way of improving mental-health in work could be for more corporations to invest in apps like Headspace and encourage its use. Nonetheless, I am glad to know it is already growing in popularity in workspaces.

There are also many examples of meditation being used in schools. In fact, a Vox news video clip discusses meditation in public schools and describes differing perspectives on whether or not it should be encouraged in public schools (Vox, 2017). Vox lists many programs and foundations, like Minds Inc., Mindful Schools, Mindup, The David Lynch Foundation, and others, working towards bringing mindfulness into public schools (Vox, 2017). Even more, some schools are testing meditation time as a substitute for detention, which seems much better than just sitting doing nothing (Vox, 2017). However, there has been pushback by critics, arguing that teaching meditation to students is going against the law, which states that teaching religious practices in school is unlawful; some argue that mindfulness is inherently a Buddhist tradition, while defenders argue that it is taught secularly and is more focused on the scientific benefits (Vox, 2017). As a result, many programs secularize meditation and teach it as a scientifically-backed practice to improve well-being (Vox, 2017). I can understand the hesitancy in teaching students mindfulness (even I had my own mental debates about if practicing yoga and mindfulness goes against my Christian beliefs), however, for the sake of improving

well-being, whether mental, physical, or cognitive, science has shown significant support for these practices in enhancing well-being. I am not here to discuss whether or not it goes against the law to promote mindfulness for students, but I am happy to see that there are programs teaching mindfulness and its many benefits to students.

It is important to briefly note that universities are also recognizing the importance of some of these habits by actively finding ways to utilize them. One example of this is Texas A&M University (TAMU) who utilizes self-compassion in their Counseling and Psychological Services department (TAMU, 2021). As a reminder, self-compassion is “the practice of showing oneself kindness, recognizing that we are not alone in our struggles, and engaging in mindfulness,” as described on TAMU’s website (TAMU, 2021). In fact, they list many resources for different types of struggles students go through, such as anxiety, depression, or even how to conquer an exam (TAMU, 2021). One of the resources offered is self-compassion, as they explain what it is and link to Dr. Neff’s website for use and more information (TAMU, 2021). Additionally, DePauw’s Counseling department recognizes these habits’ importance as they actively promote mindfulness meditation events. I am happy to see that more universities are already implementing and encouraging such habits to students.

Overall, there are already-developed programs and apps that promote the practice of mindfulness in schools and at work for the sake of improving students’ and workers’ well-being, whether for focusing, managing stress, or working with others better. With the alarming rates of mental health crises due to COVID-19, mindfulness programs and applications, like the ones reviewed, is a great start to help alleviate depression, anxiety, suicide, stress, etc. However, I believe the practice of mindfulness can be taken a bit farther as opposed to simply covering the

cost of a mindfulness app or a week mindfulness program in work or even just an after-school program.

Below is a list of viable and effective ideas to help in addressing the CDC's call for intervention and prevention programs to address the alarming negative mental health rates. They are a glimpse of my vision to more thoroughly imbed such health habits into the culture overall.

#### School

- Government-funded nation-wide programs encouraging and teaching health habits, like mindfulness
- Make meditation and reflection the substitute-norm for detention
- Have mindfulness breaks scheduled throughout the school day, maybe 10 minutes in the morning before classes begin, maybe during/after lunch, maybe right before school ends (asking students to recall what they learned and reflect on their day, both personal experience and academic learning can not only help in being mindful and reduce mental health issues but also improve learning and recall memory!)
- Have educational workshops on the usefulness of mindfulness (ie. helps in memory) to motivate students to meditate

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#### Work

- Not only corporate funding for mindfulness apps/programs but encouraging/rewarding the employee culture to make mindfulness breaks a staple in their daily work schedule (ie. 15 minute meditation before or after lunch, 5 minute mindfulness during the morning internal team meeting)
- Have educational workshops on the usefulness of mindfulness (ie. teach Liu et al.'s (2020) study that shows how high mindfulness levels correlate with high work engagement through improved recovery; thus, may lead to better job performance and may improve employees chances of getting a raise or promotion)
- Maybe encourage employee relationship bonding through their participation in meditation programs, like a weekend team meditation retreat before the start of a new big project

These are simply ideas and in no way are exhaustive of the possibilities to help address the mental health crisis. The basic premise of this approach to addressing the CDC's call to action for intervention and prevention efforts for the alarming mental health rates is targeting the spaces most of us spend our time: school and work. My main suggestion in taking things further in

mindfulness at work and at school is to make it universal at all schools and workplaces and, most importantly, create a mindful culture that actively teaches and encourages its practice.

Some of the suggestions I listed are inspired by the way I came to love and appreciate the use of meditation. Particularly, sometimes before I sit down to start a big project, I first sit to meditate mindfully to warm up my mental-focusing muscles. I've done that for both school and work projects and has honestly helped me to stop getting distracted and to quickly recover whenever I do, just as Liu et al. (2020) suggested with high levels of mindfulness being correlated to high levels of work engagement being mediated by recovery level. Or even when I am feeling sad and depressed, I sit down and meditate on all the blessings I have in life, like my loved ones, to help me get out of a rut. Overall, I have seen the way meditation has helped me as I integrate it more so into my daily life. Thus, I would love to share that wisdom with others, whether that's to help others improve their focus, do better in school and work, or even to help alleviate stress or create a healthier mindset when our mental health takes those dips.

As a student, I think it would have been beneficial to learn mindfulness and its scientific background early on in school, but luckily I had this opportunity to go to college and write this thesis to do so. In that same spirit, I hope that my future workplace actively promotes mindfulness for overall health.

## **Conclusion**

It is my hope that health practices, like meditation or yoga, are taught, encouraged, and actively practiced as part of school and work environments; specifically, to help face the growing mental health crises. The CDC's call-to-action for more intervention and prevention efforts to confront the alarming depression, stress, anxiety, and suicide ideation rates helped motivate this project (Czeisler et al., 2020). As I reviewed the empirical evidence behind yoga, mindfulness

meditation, and other meditation practices like heart coherence and self-compassion, I concluded that all of these practices are promising methods to help improve mental and physical health and overall well-being; with yoga and mindfulness also having significant evidence for improvements in cognitive functioning.

In my own experience, as described as part of the self-study, these practices have helped me to better manage stress, feel less anxious, and take a more compassionate and appreciative approach to my own life. Although the self-study statistical data I reported may not show statistically significant improvements, I would put more emphasis on my own personal reflective experience as opposed to a flawed, one-participant study. To make up for my self-study's lack of statistical significance, I point to the practices' empirical literature reviewed above to show that these practices do indeed help one to improve their mental health and approach to life.

As I conclude my thesis experience, I am happy that I got to review the empirical evidence as to why I should continue practicing these habits. In fact, I continue to improve my own use; when I need to study or really focus up on a project, I often sit to mindfully meditate, either by focusing solely on my breath or heartbeat with my hand above my heart or stomach before diving into work; during rest days, like Sundays, I often sit and practice self-compassion and/or heart-coherence meditations by consciously cultivating appreciation and compassion. I find that I genuinely feel much more joyous as I explicitly recall the blessings I have in life, especially those that I often take for granted.

Honestly, after my accident was when I began to recognize the importance in appreciating even the seemingly everyday things. It has helped to sit back and be consciously grateful, whether that is for caring and loving family and friends, having insurance, having a house over our heads, food on the table, or even simply our breath or the fact that we are alive.

My life as I knew it could have been stripped away from me all in an instant, but instead, it was luckily a wake-up call, telling me to take it slow, appreciate life, and that things will work out as they need to. It was something I needed to understand because, to be honest, I was stressing out over what was going to happen after I graduate, instead of being where my feet are, and focusing on enjoying my last year of college and simply just making sure I do graduate. Now, whenever I sit down to meditate, I start saying “thank you, God” even for the littlest things: my breath, the fact I am privileged enough to have an education, loving and caring family, friends, advisors, and mentors, and even a job. I have learned to keep a balance with cultivating loving relationships and working towards success; if I want to feel fulfilled, happy, and live a long life, I must internalize what I learned, not just from Harvard’s longest study on happiness but also as a result of getting hit by a car, that long-happy lives are usually lived by having high quality relationships with loved-ones (Waldinger et al., 2021). Overall, I now consistently maintain a self-care health habit like meditation to not only improve my overall well-being but improve myself to improve the quality of my relationships for that end-goal of fulfillment and a happy-long life.

As I have personally seen the ways in which my life has improved (less stress, less anxiety, more overall-wellbeing, more positive/gracious thoughts, improved relationships with others and myself, etc.) as a result of these health habits, it is my hope that I can spread the wisdom to others. Hence, I would like to echo and extend the CDC’s call-to-action to help overcome the alarming negative mental-health rates in our society, specifically by calling for improved integration of health-habit programs at schools and at workplaces, with the main goal of creating mindful-loving cultures.

I hope, at the very least, this thesis has inspired you to meditate or practice yoga. You can even start now, by downloading a meditation app like Headspace or Calm (Headspace, 2021;

Calm, 2021)! I mean, the benefits are clear, you can improve your well-being, grow in joy and appreciation of life, and so much more!

### Afterword

Other than these habits having the potential to help mend the mental health crisis, improve physical health and cognitive functioning, I have been wrestling with how these habits play into the bigger picture of life. Some of the questions I find myself asking are: How can these health habits help us to improve our own lives? How can they help those who are systematically under-resourced? How do they play into the hyper-consumer world we live in? How do these habits help to achieve what is valued in our neoliberal world, which is profits and capital? What should global values really be? Should we continue to be working towards profits and capital, even with our one home, planet Earth, burning up? Should we be so focused on profits even when there are many fellow human beings that do not even have basic necessities, like food on their plate, roof over their heads, clean water? How can these habits help us to wake up and right global wrongs? Do these habits contribute to the danger that we are individually complacent while a larger collective suffers? And do the workplace well being programs encourage this complacency and self-satisfaction so workers do not challenge conditions in individual workplaces and a larger system?

I initially attempted to tackle some of these questions in this thesis, but I was unable to come to clean conclusions. It is my belief that growing in awareness through meditative practices can not only help to alleviate mental health problems but may also help folks to think critically on how their life's position relates to the world at large. If critical awareness is nurtured globally, people may be more prone to make better decisions, not just for themselves but for the common humanity. Folks may even strive to work better together, overcome bigotry, hatred, racism and

the like, to organize, as a common humanity, in reorienting this world from a priority of profits to a priority of health and nourishment, in which all humans are granted life's blessings, like basic needs such as food, water, safety in a home, education, and most importantly, chances to grow and share in love with other fellow human beings. Perhaps these habits may only help us to be better workers in this broken system, but I am perceiving them to be a stepping stone to fixing it. Regardless, these are questions I will continue to wrestle with even after this thesis.

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## Appendix A

1. Nature therapy benefits: improve mood, anxiety, stress, depression, etc.
  - <https://www.webmd.com/balance/features/nature-therapy-ecotherapy> (Sorgen, 2013)
2. Wim Hof breathing benefits: control of sympathetic nervous system and immune response; enhance anti-inflammatory responses
  - <https://www.wimhofmethod.com/science> (Wim Hof Method, 2021)
3. Mindfulness Meditation: (see Mindfulness Meditation section on p. 33)
4. Heart Coherence Meditation: (see Heart Coherence section on p. 37)
5. Yoga: (see Yoga section on p. 14)