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The State and Place of Mindfulness in Modern Research

Blake Manale
University of New Orleans

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THE STATE AND PLACE OF MINDFULNESS IN MODERN RESEARCH

An Honors Thesis

Presented to

the Department of Psychology
of the University of New Orleans

In Partial Fulfillment

of the Requirements for the Degree of
Bachelor of Science, with University High Honors
and Honors in Psychology

by

Blake Manale

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Abstract

Originally derived from Eastern religions, the concept of mindfulness has been adapted and validated by psychology and medical science within recent decades. This project describes some of the religious viewpoints associated with mindfulness and its related practices, such as meditation. The primary focus however, are the forays into scientific study using validated methodology to understand what mindfulness can and cannot affect as it relates to physical and mental health. The initial studies serve as proof of concept and cover simple reductions in symptomology and suffering for conditions like anxiety and depression. The scope of mindfulness application grew as research progressed, leading to more focused studies involving the extreme stress of medical students, the lifespan of the elderly, and autobiographical memory for those in remission who had depression. Like all respectable scientific experimentation, having the ability to quantify the results and observations seen is accounted for by these studies. Furthermore, a cohesive model and adapted measurement scale are discussed to denote the clout carried by mindfulness and related practices. In closing, discussion of current research directions are given along with a re-emphasis of conclusions established in the literature.

Keywords: Mindfulness, Meditation, Therapy, Attention, Mental Health

Introduction

Society rewards critical thinking and problem solving, but other cognitive abilities also carry benefits. The ability to clear one's mind, be present in the moment, and contemplative without an urgent need for outside application have been shown to be worthwhile. These practices fall under the concept of mindfulness, which has been a topic of wide interest in recent decades. Many physical, emotional, and spiritual benefits are said to exist for practitioners of mindfulness. Spirituality was the focus initially with various religions discussing the concept and the purpose. In recent times, the science of psychology has undertaken quantifying, studying, and applying mindfulness. As Hocevar (2015) points out, the theological aspect is often avoided in scientific study. Yet, there is still some confusion as to what is strictly spiritual and what has been demonstrated and documented. That doubt, however, does not negate that mindfulness is a topic worthy of study. Mindfulness and the practices it advises have been tested and demonstrated to be effective tools in helping people in their daily lives and are especially beneficial for the mentally ill (Hocevar, 2015).

Body of Paper

Religious Origins

The primary way mindfulness may be seen in the public eye or popular culture is that it is only spoken of by ancient monks and New Age gurus. This is not the case, as many scientists and healthcare providers have now embraced the concept. Still, some consideration should be given to the spiritual viewpoints on the topic. For example, Christianity and Buddhism have different interpretations overall, but both undoubtedly have faith in mindfulness. Buddhism and Asian religions in general are far more relaxed, viewing spirituality as just another aspect of life, even a resource. Multiple viewpoints

may be blended without judgement or sacrificing the integrity of holding another view. This is characteristic of Asian cultures as a whole, which are pluralistic in nature and tends to promote harmony and tolerance. In contrast, Christianity is less flexible and tends to take an all or nothing approach regarding religious membership. Both schools of thought, however, had figures in them that dwelled on mindfulness, such as Thich Nhat Hanh and Thomas Merton, for Buddhism and Christianity, respectively (Ih-Ren Mong, 2015).

Within Buddhism, more specifically Theravada Buddhism, mindfulness is understood to be a type of meditation in which one focuses on bodily sensations, thoughts, and emotions. The goal of this is to help reach enlightenment or nirvana. The word “mindfulness” in this context takes meaning from a Buddhist Pali scripture term, which is *sati*. This entails awareness as it relates to attributes such as consciousness, the mind, and memory. Through concentration and meditation, one is keenly aware of their activities and current state. Living in the moment and understanding that moment is paramount to this school of thought. Thich Nhat Hanh believed in the value of living in the moment, with further thinking on this path involving a detachment from judgement, a decline and disownment of self, and freedom from conventional worries. Anatta, which holds the idea of no-soul and a lack of a false self, is picked up on the contemplative path by mindfulness processes, along with other elements of Pali scripture. If one is enlightened and mindful, they have achieved the elements of Pali scripture and thus are “spiritually awake.” It is said that perfected mindfulness can produce contentment. Additionally, one may be freed from things like greed and worry (Ih-Ren Mong, 2015).

Thich Nhat Hanh’s belief in the concept went deeper than just believing mindfulness is effective. He actually used mindfulness to help other individuals find

peace, believing that all people, regardless of creed, could find peace in the world. The concepts of awareness that mindfulness cultivates are the opposite of “machine thinking,” where even in simple tasks, one is fully aware and in the moment. By using mindfulness to nourish the good things, or “seeds” in life, benefits may be gained, including understanding, compassion, and healing. He spoke of the seven “miracles” and four “establishments” of mindfulness, which correspond to aspects of awareness and being present. The miracles focus on transforming suffering and garnering peace, freedom, and joy. The establishments refer to the foundation of life and being mindful of body, mind, feeling, and phenomena in the world. While Thich’s thoughts were more explicit and he provided a more expansive framework, they were very much aligned with and inspired by, the overall Buddhist teachings (Ih-Ren Mong, 2015).

Thich’s contemplation, similarly to the Buddhist outlook as a whole, was open to multiple sources of knowledge and paths. He had an interest in Christianity’s perspective on mindfulness and implied that one may interact with “the living Christ” or “living Buddha” via mindfulness. Thich felt that the Holy Spirit was present in tandem with the presence of joy, peace, and mindfulness. His thoughts, circa 1995, seem to be in agreement with a group known as the “Pentecost/Charismatic” Christians. This group holds an awareness that God has an effect and presence in the lives of individuals. Both Thich and these Christians are attempting to be focused and mindful of the spiritual elements of their lives. While Buddhism and Christianity are not normally juxtaposed, Thich proposed that Buddha was not in opposition to the Christian God, only the human interpretation of God. Furthermore, a more appropriate path to God was via the Holy Spirit he spoke of, as opposed to typical theology (Ih-Ren Mong, 2015).

Within Christian doctrine, there is a version of mindfulness, as pointed out by

Aloysius Pieris, who taught the subject. This version was reputable enough that Pieris purports that it should be part of the Church's teachings. One of the key aspects of the view of mindfulness supported by Pieris is that of recollection. People must remember and be mindful of how God has cared for them in their lives and Him being "mindful" of mankind. The other principle is that of recognition, such as recognition of the sacredness of the present moment. This mindfulness relates to the contemplative nature of Christianity. A potential balance could be struck of valuing the moment at hand and the foretold glory of God's Kingdom, which is a major aspect of the Christian doctrine. It is worth noting that in addition to Pieris contributing to the indication of mindfulness' place in Christianity, Thich also played a role. Thich was part of a gathering of one hundred sixty religious leaders, representing many different sects of Christianity and different world religions. A priest, Daniel Berrigan, attested to the fact that the different faiths brought their individual traditions, but prayed together (Ih-Ren Mong, 2015).

Using a biblical lens to view mindfulness has led to strides within Christianity's conceptualization of the practice and for scholars within the religion who have studied the subject. Monks have created a prayer practice known as *lectio divina*, which involves a group listening to excerpts from the Scriptures to build friendship and center themselves. A monk named Thomas Merton, who knew Thich, wrote a book called "Seeds of Contemplation," with thoughts that correspond to ideals of mindfulness. Merton essentially speaks of the value of living in the moment and being present and aware. He tells that one must be aware of surroundings and the sorrow and joy that others experience. Saints were said to be "absorbed" in God. Even one's body should be minded, as it was created by God, and thus is holy. By embracing the moment and allowing it to fill oneself, both a sense of peace and deep love may be achieved. In

addition to the parallels with awareness associated with mindfulness, the teachings of Merton correspond to some Buddhist concepts of self. Merton believed that it was good to escape self that was outside of God and thus, was false. Buddhist teachings include that “self” is not real, similar to a version of self proposed by Merton. As a start to this path, Merton advises new pupils to have the skill and concentration to have reign over their thoughts and memories, so that they may adequately comprehend and experience the present moments and God. Notably, Merton was not the only Christian monk to contemplate these topics (Ih-Ren Mong, 2015).

Thomas Keating was a monk that believed in prayer and having awareness of not only what one is doing but knowing the intent and purpose behind an action. Having the proper intentions and attention to the moment, is a contemplative service. This and other ideas about mindfulness have pervaded the Christian religion. In addition to the ideas put forth by Keating, James Finley wrote a book that served as a guide to meditation, including advice about proper breathing and the vigilant mindset to stay in the moment and not let the “self” disrupt being present. Anthony de Mello, S.J., was a Jesuit Priest and early proponent of the Buddhist mindfulness practices within Christianity. He believed, much like Thich, that being in touch with bodily reactions was a worthwhile practice and specified that it was a valid way to start communing with God. More in depth, Axel Michaels stated that there were two paths to understanding Buddhist meditation. Much like previous thinking, Michaels believed one could use meditation to become less entangled with the superficial “self”. The second way Michaels felt meditation could be applied is in prayer, as the monks did throughout history. He did make the distinction that Buddhists do not have God in their prayer and ergo are fundamentally different from the prayer of Christianity (Ih-Ren Mong, 2015).

Modern Mindfulness Practice

World religions hold the older ideals concerning mindfulness and related practices, but in the past few decades, science and a man named Dr. Jon Kabat-Zinn are responsible for more modern and empirical views on the concept. Kabat-Zinn is responsible for the opening of the Stress Reduction Clinic at the University of Massachusetts in 1979. The clinic's program has two main parts, an eight-week initial period intervention and then four years of maintenance practices. In the beginning, the program consisted of mindfulness meditation, yoga, and mind-body connections, which is still in practice. Kabat-Zinn developed the program from experience with those seeking relief from pain caused by chronic conditions. The patients Kabat-Zinn first worked with, according to his findings, had notable improvement in the areas of depression, pain, anxiety, and fatigue. In the early days, stress reduction, was not explicitly said to be related to mindfulness. Alongside Kabat-Zinn, Saki Santorelli helped develop the program and clinic into the Stress Reduction Clinic. By the 1990s, mindfulness and related techniques were more well-known and used for depressed patients. Types of cognitive therapy have integrated mindfulness, treating additional conditions, such as anxiety, substance abuse, and eating disorders. Accepting negative experiences is said to be a facet of why mindfulness is effective. It is worth noting that Kabat-Zinn avoided stressing the origins of the topic in the realm of religion. Given the importance of having only tested and scientifically based conclusions used, skirting around any tethers to theology was a wise move (Hocevar, 2015).

Modern Mindfulness Research

Kabat-Zinn and Santorelli were not the only people working with mindfulness and related concepts around the 1980s. Langer and Imber (1980) studied the perception of

those considered deviants and accuracy relating to mindlessness and mindfulness. The thinking was that people considered “deviant” or atypical would be more accurately perceived. The study discusses levels of attention paid and details noticed regarding perception. Often times, people have mindless engagement with the environment and do not question most elements of that environment. They propose that when someone is more mindful, their perceptions will in turn gain accuracy. Perception accuracy is hypothesized to vary directly with rating the observed subject as a deviant, as once a more attentive and mindful view is directed to something, normally unnoticed details will be seen as conspicuous, even if such a detail is completely average. The study was done at Harvard and 143 students participated under the guise of it being for computer dating research. Students observed and were asked to evaluate people on a videotape under both a mindful and mindless condition. The mindfulness condition was generated by participants being given a data booklet about the person observed in the video that denoted one thing that at the time was considered socially atypical (at the time, the examples were attributes such as being a divorcee, cancer patient, or ex-mental patient). The control, mindless, group did not receive any such condition and all groups saw the same video. After viewing the video, participants were asked to recall certain physical characteristics of the person in the video, as well as compare them on a 1-10 scale for how well certain aspects of that person match most people. The final evaluation involved altered photograph versions, such as the person with darker eyebrows and slightly different hair, etc. of the person in question. Results supported the hypothesis set forth by Langer and Imber as the mindless group recalled less about the person in evaluations than those in the mindfulness group. Both on the measure of recalling attributes such as hair or eye color and for remembering more distinctive characteristics such as finger tapping in

the video, $p < .001$. The mindful group rated the subject as more atypical even with features that were normal. This supported the idea that while recall was more accurate, ratings were higher and both of which were significantly different from those of the mindless group. The study seemed to indicate that those who are mindful or are primed to be mindful, are more accurate in their judgements, but also more extreme in those judgments. For the larger topic of mindfulness, the findings support the idea that the attentiveness of mindfulness improves cognitive skills such as detecting details and recall. While being judgmental is not a tenet of mindfulness, the cognitive boost should not be ignored (Langer & Imber, 1980).

As the exploration of mindfulness and its benefits progressed, it was thought that not only could life be improved by mindfulness, but potentially extended. Alexander, Langer, Newman, Chandler, and Davies (1989) investigated whether mindfulness can improve health where one's lifespan may be increased. They took notice of mindfulness and transcendental meditation being subjects of study as well as the previously established notion that state of consciousness can have psychophysiological effects. The purpose was to carefully examine the biological consequences and potentially adaptive benefits of these techniques. Previous research was cited where elderly participants were studied and given cognitive demands that fostered a more mindful thought process. Both physical and psychological health seemed to be improved under these conditions, with a reduced mortality rate compared to control groups. Regarding mindfulness, the researchers hypothesized that mindfulness training will help reverse cognitive decline and extend lifespan compared to a minimal mindfulness/relaxation training group and a group receiving no treatment (Alexander et al., 1989).

In this experiment, there were 73 participants whose data was used with a mean age

of 80.7 years of age. Those people were divided into four groups, transcendental meditation ($n=20$), mindfulness training ($n=21$), meditation relaxation ($n=21$), and a group with no treatment ($n=11$). Both pre-testing and post-testing were applied, with the post-tests being done over 12 weeks, followed by staff assessments at 18 and 36 months. These evaluations looked at physical, cognitive, and psychological criteria. Simple measures such as longevity and blood pressure were assessed in physicality while cognitive tests used included phase one of the Dementia Screening Test (DST), the Word Fluency subtest, which is similar to a word-production task of mindfulness training, and the Object Uses Test (OUT), which can act as a measure of mindfulness and thus, longevity. For mental health, self-reports such as the State-Trait Anxiety Inventory (STAI) and the Internal Locus of Control Scale (LOC-I) were used in conjunction with ratings from nursing home staff. The mindfulness training involved a word production task wherein the participant thinks of a word, then another word that starts with the last letter of the first word with words only usable one time each session. The other task involved the participant thinking of a topic in a novel way, such as taking an opposing viewpoint on a social issue or imagining new uses for a common object. Each task was done for six minutes with a two-minute rest period following completion of both tasks. Participants were asked to self-report how they felt during and after tasks were completed and if they felt the program was worthwhile. After the testing phase, data was analyzed using an analysis of covariance with the pretest numbers considered as to account for preexisting differences between and within groups in addition to regular statistical analysis (Alexander et al., 1989).

In general, transcendental meditation had the greatest effect, followed by mindfulness training as being more effective than relaxation meditation and lack of any

treatment. The groups associated with the top two programs had higher survival rates within the next three years than other groups. Transcendental meditation and mindfulness training saw significant results on the measures of internal loci of control, word fluency, associate learning, and systolic blood pressure. Nurse assessments over the next 18 months and posttests of these elderly participants support the idea that mindfulness boosts mental health. The participants themselves reported benefits such as being less impatient, more able to cope, and “less old.” This experiment adds to the clout of mindfulness displaying tangible benefits when put under the scrutiny of science. Cognitively, the elderly benefited from exposure to the mindfulness program and its tendency to direct attention and focus on the task at hand. The relaxation meditation only group, not having notable results, indicates that the active component of mindfulness is paramount to reaping any considerable benefits. The aftermath of the experiment indicates that not only can the condition of one’s life be improved, but extended (Alexander et al., 1989).

In addition to mindfulness being a tool to better the health of the elderly and those seeking help, people who oversee care can benefit as well. A 1998 study by Shapiro, Schwartz, and Bonner used medical students and those on a premed track to study the benefits of mindfulness-based stress reduction. Those in the medical field face extreme stress, which can have harmful effects on health, and thus, on patient care. According to research, even before one finishes their medical education, they can fall victim to anxiety and depression characteristic of high stress situations. Also cited was the success of Kabat-Zinn’s clinic, but the experimenters discuss wanting a more rigorous test mentioning a lack of control groups in the clinic’s program. They discuss mindfulness as a “conscious moment to moment awareness” (Shapiro et al., 1998, p. 583) and the benefits of objectivity, nonjudgmental outlooks, as well as a gentler approach to the

world because of the practice. The researchers hypothesized that the mindfulness intervention would reduce anxiety, gauged with the STAI-1, and psychological distress, measured with the General Severity Index (GSI) of the Hopkins Symptom Checklist 90 (SCL-90). Furthermore, it was predicted that improvement would be seen in mindful listening skills and empathy as measured with a modified version of the Empathy Construct Rating Scale. Spirituality, assessed using the INSPIRIT, was also a concern and measured for the participants, but researchers looked at this variable under a scientific lens as it has been shown to be a buffer against stress (Shaprio et al., 1998).

These measures were used on the 73 participants that were recruited, filled out their forms, and met criteria to be randomly placed in either the control group or the group receiving the mindfulness intervention. The intervention lasted seven weeks and had two groups only differing in their facilitator, which was done to test generality of the program. Testing and assessment occurred right before intervention and afterwards when exams were taking place. The timing was done to see effects of the intervention in an arduous and stressful time. Location, time, and date were kept consistent for both intervention groups as to aid consistency and assessments were given 15-20 minutes after the final session after a meditative state would have worn off (Shaprio et al., 1998).

The intervention lasted seven weeks and took heavily from Kabat-Zinn's work, with several techniques included. Sitting meditation was done with a focus on thoughts and sensations in the body while eventually returning attention to one's breathing. The "body scan" had participants consciously examine through their body and noting any sensations unique to an area. A type of yoga comprised of stretches and holding postures that enhance the musculoskeletal system and also enhances awareness. These three techniques, which all had a focus on staying attentive to breathing, were bolstered by two

additional meditation types, “lovingkindness” seen in Kabat-Zinn’s clinic, and “forgiveness meditation,” which was not from the clinic. Beyond this, exercises intended to foster empathy and mindful listening were done, with groups being divided into smaller groups to share experiences and presentations on stress and coping were also components of the intervention. Alongside sessions of these practices, participants kept a journal during the seven-week period and filled out packets afterwards to give feedback (Shapiro et al., 1998).

Much like in the studies done by Kabat-Zinn, most participants completed all parts of the process. After using a chi-square test to verify that random assignment with demographic information served its purpose, a repeated Multivariate Analysis of Variance (MANOVA) showed that the control and intervention groups were significantly different on dependent variables after the seven weeks, with $p < .03$. To minimize any effects had by covariables and Type 1 errors, a Multivariate Analysis of Covariance (MANCOVA) was utilized. To ensure there were no significant differences between the groups beforehand, Newman-Keuls test were performed. Results from a univariate ANOVA showed that intervention group showed significant differences compared to the control group. Significant decreases were in seen in GSI, $F(1,69) = 6.62, p < .02$, depression $F(1,69) = 8.18, p < .006$, state anxiety $F(1,69) = 4.11, p < .05$, and less trait anxiety $F(1,69), p < .002$. There were also increases in empathy $F(1,69) = 4.3, p < .05$ and spirituality $F(1,69) = 5.62, p < .02$. These results being obtained during the exam period make them seem even more impressive, as that time of a semester is extremely stressful. It is also worth noting that similarly significant results were seen in a replication of the experiment by the same researchers after the initial run, but this time using the students in the control group. The only major alteration was the lack of trait anxiety being

a variable focused on, as a clerical mistake led to the required data not being recorded. Otherwise, significant differences for the better were found in the sample between pretest and posttests (Shapiro et al., 1998).

Overall, the experiment results and subsequent replication support the idea that a mindfulness-based program can both cultivate helpful skills and reduce stress. Even during a stressful exam time, significant reduction of anxiety, depression, and distress was seen while empathy and spirituality were bolstered. Additionally, the work of Kabat-Zinn and his colleagues was given more credence by subjecting the protocols of the mindfulness intervention to a rigorous experiment. The investigators noted that future research was warranted and that mindfulness may be a boon to healthcare and preventative medicine. The need for programs intended to work in tandem with medicine was also brought up by researchers. While this study only covered short-term effects, the potential of mindfulness and the solidification of earlier work was aided by this study. (Shapiro et al., 1998).

The idea that mindfulness can aid those with depression, among other things, continued to be a focus of research. In 2000, a study was published wherein Williams, Teasdale, Segal, and Soulsby examined if mindfulness could benefit those who have suffered depression with autobiographical memory issues. They cited previous research that implied depressed patients struggled to easily sift through memories and thus stop at a general memory level. This leads to retrieval describing someone or events in general terms as opposed to specific past events, such as a person always being pleasant or an activity always being difficult. The study cites that overly general memory is one of the commonalities in those that have depression and posttraumatic stress disorder. This memory approach is speculated to be a cognitive style intended to avoid specific painful

memories or a side effect of memory suppression interrupting the process of memory retrieval and limiting recovery to the general level. Patients have displayed side effects of this kind of memory processing, including over generality even for positive or non-emotional memory, trouble imagining the future in detail and considering it hopeless, longer recovery time from their disorder, and increased difficulty solving interpersonal problems. The researchers set out to see if these memory issues could be alleviated with mindfulness as attention to detail and nonjudgmental memory or cognition is a focus that could decrease over generality (Williams et al., 2000).

There were 45 patients involved in the study, all of whom had a history of depression with at least two depressive episodes, one of which within two years of the study, meeting requirements for having had major depressive disorder, and been in remission without recently being medicated. Furthermore, comorbidity was accounted for and patients with other disorders were not used in the study. Researchers took from Kabat-Zinn's program and cognitive therapy techniques to make an eight-week program. Memory was assessed using the Autobiographical Memory Test, which uses neutral, negative, and positive word cues, six of each type, to participants and asking them to remember a specific event that the word given made them remember. Specificity was measured in both a pretest and posttest. For depression measurement, the 17-item version of the Hamilton Rating Scale for Depression (HRS-D) was utilized. Of the 45 patients, for various reasons, only 41 had usable data with $n = 21$ for the mindfulness treatment group and $n = 20$ for a group continuing whatever level of depression treatment they were receiving, with no major preexisting group differences. Upon processing results, no significant difference in mood with depression was found at posttest. Significance was found for time as a main effect concerning the increased amount of specific memories

given at posttest, with $F(1,39) = 15.72, p = .0005$. Additionally, a significant effect was seen for Group X Time interaction with $F(1,39) = 4.98, p = .031$. Overall, this study supports the idea that when trained to attend to details and everyday events, people exhibit less categorical memory retrieval, which is more general in nature. More specifically, the significant reduction in over general memory retrieval for the treatment group shows that mindfulness-based cognitive therapy can aid memory as it inherently counters the avoidance of details (Williams et al., 2000).

Modern Mindfulness Measures

Recently, studies have continued to focus on mindfulness and some more specifically on precise measurement as to better evaluate data. In 2011, an article by Brown, West, Loverich, and Biegel details the usage of a scale they describe as the Mindful Attention Awareness Scale-Adolescent (MAAS-A) for participants ages 14 to 18. The authors of the article cite that mindfulness has primarily been studied in adults, but a trend to study younger populations is occurring and thus tested and valid measurement tools are necessary. Furthermore, existing mindfulness measures are differing in certain respects but tend to correlate, likely due to different interpretations of the concept, such as behavioral therapy or a more cognitive approach focusing on attitude. The scale the MAAS-A is based on, the Mindful Attention Awareness Scale developed by Brown and Ryan (2003), has origins in the belief that mindfulness is a “quality of attention.” Via the scale, mindfulness is taken to be an attentive condition supplanted with an awareness of surroundings, primarily just observing. This scale has been verified and validated by various studies and populations. The scale has also been seen to be viable cross-culturally, receptive to mindfulness training as receiving training appears to lead to higher scores and measures people whether they are trained or

untrained. The scale has also been seen to predict various attributes such as adaptive behavior regulation, higher emotional well-being, better judgement, and lower vulnerability to relapse of depression. For learning if the scale was adoptable for the adolescent demographic, two studies were conducted (Brown et al, 2011).

The first study intended to investigate the validity and reliability of the adapted scale (MAAS-A) using a sample with the target age range. To get a grasp of the structural validity for the scale, factor analysis was used, and various indices were studied. There were 595 participants whose data was used after they were divided into two groups. Measures used for study include the Adolescent Personal Style Inventory, which measures traits like conscientiousness, neuroticism, and extraversion for personality. An arousal measure known as the Positive and Negative Affect Schedule (PANAS) was used as previous research supports its use with adolescents. To measure satisfaction in various areas of life, researchers used the Brief Multidimensional Students' Life Satisfaction Scale. Participants were asked how often in the past month have they felt poorly enough to not go to school or feel as if they should stay home and how happy they felt to gauge sense of wellness and happiness, respectively. Alcohol and drug use for coping purposes was estimated by participants with a 1-5 scale. Lastly, self-regulation was measured with the Mindful Thinking and Action Scale for Adolescents' Healthy Self-regulation subscale. Upon doing an exploratory analysis, a notable single-factor solution was seen with corresponding item-total correlations and factor loadings. A confirmatory analysis likewise had significant results. The validity of the MAAS-A was bolstered by this first study (Brown et al., 2011).

The second study went further and used a clinical context to test the MAAS-A. The aim of this study was to see if validity and consistency of mindfulness measure would

hold up within the context. From psychiatric outpatient therapy populations, 102 adolescents participated with the same age range as the first study and had various psychological conditions including mood disorders, substance abuse, and anxiety. All participants received pretest and posttests along with a follow up three months after the study. A 2 X 3 mixed factorial design was used wherein categories were whichever group a participant was randomly assigned to and the time of test. For the control group, $n=52$ and participants continued outpatient treatment as normal, whereas for the treatment group, $n = 50$ and participants took a mindfulness-based stress reduction program that lasted eight weeks in addition to regular treatment. The program emphasized mindful practices such as how to observe events in a specific, nonjudgmental way. Practices such as group sharing, meditation, and yoga were taught, and discussion topics were geared toward adolescents with talks on interpersonal communication, self-image, and self-harming behavior. Scales used include the Rosenberg Self-Esteem Scale, the Perceived Stress Scale for the past month, and both the trait and state aspects of the State-Trait Anxiety Inventory. A restricted maximum likelihood (REML) mixed modeling approach was used for analysis of the mindfulness group versus the group only receiving their treatment as normal. Statistical analysis revealed that the mindfulness treatment participants had significantly higher $p < .001$, MAAS-A scores between pretest scores: $M=3.31$, $SD = 0.78$, and follow-up scores: $M= 3.76$, $SD = 0.70$. Between pretest and posttest, a significant difference was also seen with $p < .01$. Furthermore, REML analysis showed that mental health readings varied in the proper direction with MAAS-A scores, such as higher MAAS-A numbers alongside reduced anxiety and stress and higher self-esteem (Brown et al., 2011).

Together, these studies substantiate that the MAAS can be adapted to adolescent

populations and used in the future. The article did discuss future research becoming more specific in testing the scales with certain populations, disorders, and conditions.

Additionally, more research may be needed before the MAAS-A is used for predictive purposes to the degree the adult scales are utilized. Even so, the validation of mindfulness measures with established scales such as those gauging self-esteem, anxiety, and stress lends credence to the study of mindfulness as a psychological facet overall. This article can also be taken as an indication of progress in mindfulness research. Many of the studies in previous decades discussed potential capabilities and made mention that mindfulness should be studied more thoroughly. At this point, mindfulness is established to the point where more specific research tools are being developed on its behalf, signaling its validity in the scientific community (Brown et al., 2011).

The construction of tools to study mindfulness continues in recent years. One prime example is the work of the Peter Malinowski and his 2013 article detailing the Liverpool Mindfulness Model. The model was put forth as a cohesive structure of the mechanisms of mindfulness with the argument that if these components were more adequately understood, then both new and existing programs could be improved and fitted to specific situations or conditions. The article references Kabat-Zinn's work as well as the research of others and presents its operational definition of mindfulness based on the literature, calling it "a non-judgmental awareness of the present moment and is thought to entail paying attention with a certain attitude," (Malinowski, 2013, p. 2). Also discussed is meditation as a mental technique to improve one's ability to be mindful. These generalizations of the concepts lead to discussion of the Liverpool mindfulness model, which is split into five levels. Visual representation of this model can be seen in **Figure 1**. Tier one refers to motivational factors, tier two refers to the process of and how one

does mind training, and tier three focuses on consistent practice and improvement of core mental processes. Tier four is more expansive and discusses the refinement of attention practices in regard to an improved mental attitude or stance. Finally, tier five is concerned with the outcomes of these processes across physical and emotional health, cognition, and behavior. In summation, the thought process is that if attentional skills are improved, cognition gains flexibility, which enables the non-judgmental outlook. This outlook bolsters behavior and actions, which in turn leads to positive outcomes (Malinowski 2013).

Modern Mindfulness Applications

To the end of facilitating the process the model describes, training and betterment of attentional skills are paramount for mindfulness practices. Malinowski specifies two modes of meditation, focused attention and open monitoring. Focused attention meditation, which is the more common approach of focusing on an environmental aspect, such as one's breathing and pulling the mind back if it wanders. Some mental focus and preexisting meditation ability is required before attempting mode two. The second mode is open monitoring, which takes the attentional stability cultivated from meditation practice and holding the awareness wherein one observes but does not judge the sensations detected. Malinowski goes on to describe the neural networks that play roles in these meditation forms. Originally, there were three spoken of, with focus on alerting, orienting, and executive control. The last network was split into two, salience and the default mode network. The alerting network handles attention engagement, arousal, and alertness. The orienting network navigates for the process of stimulus selection. The salience network assists in determining salient, or important, stimuli and when focus on salient stimuli is lost, the default mode network takes over. These systems are active

during meditation and inform how one performs with sustained attention and focus.

Malinowski cites research supporting the ideas that mindfulness meditation improves the ability to sustain attention and efficiency of mental resource allocation. After explaining these networks and the brain structures involved, Malinowski cites longitudinal studies and studies involving the STROOP task. This task entails participants being shown color terms in font of a different color to test processing speed and attention skills, thus being adequate to test any changes in attentional processing provided by mindfulness. When coupled with fMRI scans, the previous research discussed by Malinowski supports that meditation practices improve mindfulness, and thus attentional skills. These skills in turn boost performance and reap additional benefits for practitioners of mindfulness, similarly to the model presented within the article. In addition to providing a framework for future research, the clarification and consolidation on aspects of mindfulness's processes and how the attentional aspect works, allows for more concise descriptions of the existing literature. For treatment purposes, the more well-understood attentional skills and mindfulness are, the better a care provider may treat a specific condition. This model and the specific breaking down of a mindfulness element clearly sums up the previous research and opens many doors (Malinowski, 2013).

Mindfulness has continued to be a topic of interest in psychology and still holds a place today, following the expected trajectory set by previous research. The literature has already supported that mindfulness and the related practices can help those afflicted by depression. To the ends of specification and application, a study by Farb, Anderson, Ravindran, Hawley, Irving, Mancuso, Gulamani, Williams, Ferguson, and Segal (2018), examined if mindfulness-based therapy would aid in stopping relapses in those with major depressive disorder. Also examined was the effectiveness of regular cognitive

therapy in preventing relapses. After two months of treatment of either type, patients had follow-ups every three months for two years. The data collected revealed that both mindfulness-based and cognitive therapy were effective in staving off a relapse and had about the same degree of success. Despite the differences in approaches, both teach in ways that boost metacognitive abilities and are beneficial. As mindfulness is now more better understood, comparing its effectiveness to other types of therapy seems natural. Adding a comparative element to mindfulness research allows the most effective treatment option to be seen in cases where mindfulness is applicable. Furthermore, the study discusses having a limited demographic and constraints placed upon generalizability. This, much like certain studies before it, sets the stage for studies that are more expansive in scope (Farb et al., 2018).

A more current study stands to indicate that mindfulness will continue to be applied to psychological conditions in new ways. The study by Shipherd and Salters-Pedneault (2018) looked at the effects of mindfulness and acceptance on the link between posttraumatic stress and maladaptive beliefs. This is driven less by scientific inquiry and more so by need for resources available for military veterans. Given the psychological risk of posttraumatic stress disorder for veterans, maladaptive beliefs are a concern. Maladaptive beliefs and appraisals are non-conducive to coping mechanisms and the process of coping after deployment. This particular article found there was only a minimal effect had by mindfulness and acceptance, however, did cite other articles suggesting mindfulness is useful to veterans. This study not only denotes yet another avenue of study and application, but also shows that there is a limit to the effectiveness to what mindfulness can do for a person. In some cases, mindfulness and related practices may not be an appropriate treatment, despite its general benefits. It is important to know

both the strengths and limitations of a particular approach or set of practices when attempting to understanding and application (Shipherd & Salters-Pedneault, 2018).

Conclusion

Mindfulness, its non-judgmental outlook, and techniques that it incorporates have been shown to be useful for several conditions and populations under rigorous scientific scrutiny. In the last four decades, mindfulness has been seen to improve conditions for those afflicted with mental health problems as well as boost cognitive attentional skills and reduce stress. While there may be limits on these benefits, the concept is more than just a tenet of a particular religion. The theological significance was pondered by those like Thich Nhat Hanh and Thomas Merton and certainly has a place in history, but scientists such as Dr. Kabat-Zinn facilitated psychological and medical applications. From there, the validity of mindfulness and related practices was established with an ever-expanding list of populations and conditions able to be treated. Promising results have been seen in various populations, including the elderly, adolescents, and the mentally ill. Even for those under the extreme stress of medical school, mindfulness and related treatments were able to make a significant difference. Those studies gave way to crafting mindfulness measuring tools and models for better analysis. Specification of the underlying attentional mechanisms has emerged, opening the door to further understanding. Future research is set to be a matter of refining application, such as targeting relapse prevention and establishing limits of usefulness as seen in the lackluster results of the study involving posttraumatic stress. A certainty, however, is that mindfulness is not solely a spiritual comfort. Mindfulness is an attentional mindset laden with physical, mental, and emotional benefits for those who can become skilled practitioners, which despite emerging from a place of theology, is truly a boon to the

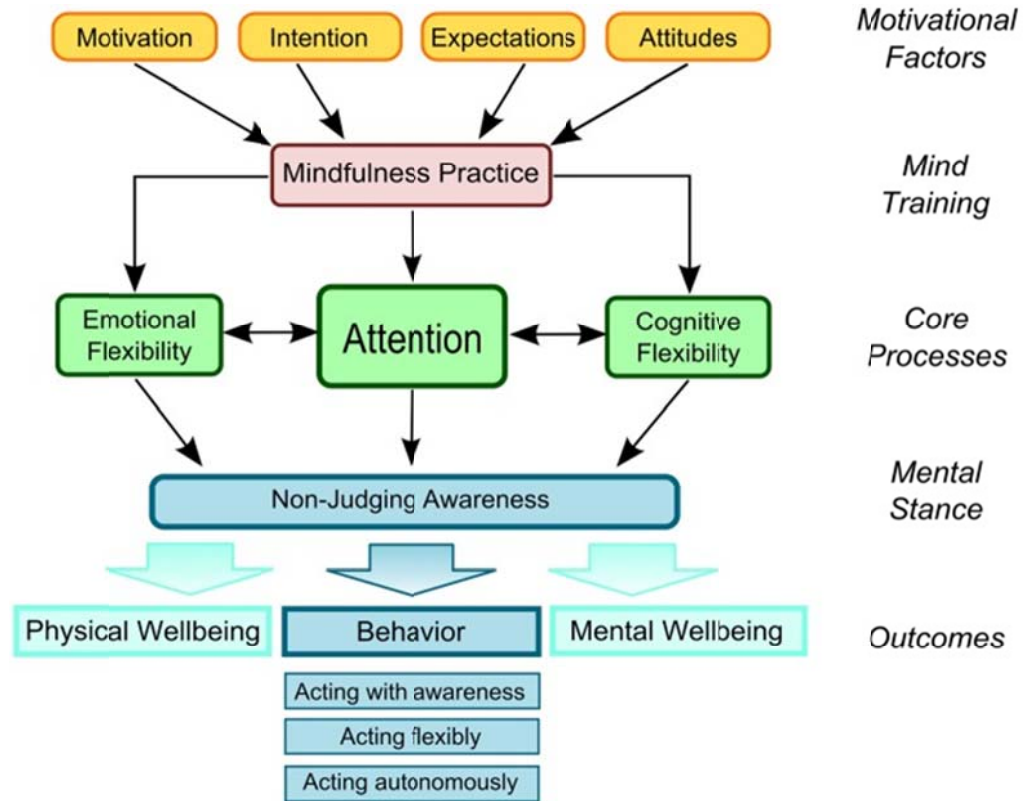
science of psychology.

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Figure 1

Liverpool Mindfulness Model by Peter Malinowski (2013).

Details the five tiers of mindfulness development and intended to serve future researchers as a reference tool.