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MINDFULNESS IN MEDICINE: MODIFIED MINDFULNESS-BASED STRESS REDUCTION (MBSR) PROGRAM AMONG FUTURE DOCTORS

by

VIRTUE SANKOH

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

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Virtue Sankoh

This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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ABSTRACT

Mindfulness in Medicine: Modified Mindfulness-Based Stress Reduction (MBSR) Program among Future Doctors

by

Virtue Sankoh

Advisor: Deidre Anglin, Ph.D.

Medical trainees are at particular risk for stress-related illness, including mental health problems such as suicidal ideation, substance abuse, and mood disorders. A vast literature on mindfulness-based stress reduction (MBSR), consisting of mindfulness education and structured meditative practices, has consistently demonstrated that MBSR and related mindfulness-based interventions improve mental and physical health, as well as one's overall sense of well-being. Moreover, theorists and researchers have begun to suggest further that mindfulness plays a particular role in social cognition, or social-emotional learning. Medical schools have long been interested in ways to improve the "soft skills" related to interpersonal connectedness that are necessary to be an effective physician, and mindfulness-based programs have gained particular traction in medical school settings. The goal of the present study was to investigate the impact of an 8-week MBSR course on student burnout *and* social cognition (as measured by theory of mind and emotional intelligence). Premedical and medical student participants were assigned to receive either (1) an 8-week course of mindfulness, (2) an 8-week general stress reduction course without specific mindfulness instruction, or (3) no treatment but rather to a waitlist group of participants who received stress reduction materials after study completion. The present study supported the published literature on the efficacy of MBSR on self-reported stress among trainees in the healthcare profession. Participants in the mindfulness intervention expressed

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significantly less student burnout when compared to the active and inactive control group participants. In contrast, the mindfulness program did not produce significantly higher levels of mindfulness or emotional intelligence among its participants when compared to the control participants. Differential results on a computerized theory of mind task suggest that the mindfulness course may have influenced first-order social-emotional perspective taking, but made no impact on higher order social-emotional perspective taking. Lingering conceptual questions about mindfulness as a psychological construct and the lack of empirical evidence about the role of mindfulness on broader social cognitive functions like theory of mind and emotional intelligence were discussed.

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Chapter 1: Introduction

The Mindfulness Zeitgeist

Mindfulness meditation has exploded in popularity in the western world over the past three decades. Individuals and institutions across North America and Europe utilize mindfulness practices to shield against everyday stress and anxiety, bolster cognitive ability and work productivity, and treat those suffering from life-threatening illnesses (Chiesa & Serretti, 2009). Kabat-Zinn (2003) an early adopter of mindfulness meditation for use in the West, described mindfulness as "the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience" (p. 145). Cultivated through traditional sitting meditation or explicit interpersonal communication skills training, mindfulness encourages one to cultivate a non-judgmental, self-compassionate stance while broadening awareness of self and environment.

Historically a Buddhist practice, mindfulness is meant to alleviate human suffering and cultivate compassion for self and others (Ludwig & Kabat-Zinn, 2008). Western-derived mindfulness practice, nonreligous and non-esoteric, has been extended from Buddhist tradition to medical settings in order to promote physical healing among patients. The earliest empirical study of mindfulness demonstrated the efficacy of a 10-week mindfulness-based stress reduction (MBSR) course on improving medical outcomes among chronic pain patients who had not improved with traditional medical and pharmacological care (Kabat-Zinn, 1982). By the early 2000s, rigorous meta-analysis of 20 high-quality empirical studies revealed that MBSR consistently showed health benefits to a broad range of individuals coping with both clinical and nonclinical, chronic and acute problems (Grossman, Niemann, Schmidt, & Walach, 2003).

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Mindfulness is theorized to impact numerous brain areas, prominently including attention and emotion regulation pathways, in order to foster salutary effects on the physical, mental, and behavioral health of those who practice.

Mindfulness in Medicine

While mindfulness practice has been primarily extrapolated for use among medical patients, mindfulness interventions developed for health care professionals in training and early practice have gained momentum. Burnout, compassion fatigue, and myriad mental health problems including depression, substance abuse, and suicide have been identified as particular challenges facing medical trainees and physicians today (Berg, 2017). Medical training programs have begun to strongly advocate for future physicians and call for solutions and interventions that might reduce trainee's vulnerability to burnout. Moreover, medical associations assert that physicians must manage professional and personal stress not only to maintain their own health and well-being but to maximize their ability to provide quality healthcare to their patients (Dobkin & Hutchinson, 2010). While implicitly valued, stress reduction, self-care, and enhanced interpersonal relatedness have not always been explicitly taught in medical school or during residency (Dobkin, 2009). Mindfulness has emerged as an effective vehicle for improving trainees' well-being by acknowledging the psychosocial and spiritual factors that influence both physician and patient outcomes.

This study investigates the influence that an 8-week MBSR course has on burnout among premedical and medical students. Study participants enrolled at Sophie Davis School/CUNY School of Medicine were assigned to receive either (1) an 8-week course of mindfulness education and practice, modified from the original Mindfulness Based Stress Reduction (MBSR) course first developed by Kabat-Zinn in the 1980s, (2) an 8-week general stress reduction course

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without specific mindfulness instruction developed by the researcher for the present study, or (3) no treatment group of participants who ultimately received the mindfulness-based and general stress reduction course material after study completion. After the 8-week intervention phase, all participants completed a self-report measure of mindfulness, a student burnout inventory (measuring stress-related outcomes), a test of affective theory of mind (the ability to take the perspective of others), and a test of social-emotional ability (emotional intelligence test). The aim of the study was consider the following research questions: Can a modified version of MBSR reduce premedical and medical students stress? Is mindfulness training a viable tool for enhanced social-emotional development among premedical and medical students?

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Chapter 2: Literature Review

Mindfulness: Buddhist Origins and Western Definitions

Mindfulness meditative practice, also referred to simply as mindfulness, has been a central element of Buddhist contemplative practice extending over 2,500 years (Shapiro & Carlson, 2017). Mindfulness is derived from the Pāli[1] word *sati,* which encompasses the root meaning "to remember" as well as "presence of mind" and "to be mindful" (Grossman & van Dam, 2011; Kang & Whittingham, 2010). "To remember" in this context does not necessarily relate to memory for the past, but rather a practice of non-forgetfulness, "not floating away from the object" (Kang & Whittingham, 2010). Indeed, mindfulness taught from the Buddhist tradition emphasizes an active process of continued and deliberate *presence*. Moreover, Buddhist tradition links mindfulness to the cultivation of compassion, wherein the meditator, whether engaged in sitting meditation or everyday activities, focuses on all living beings while wishing them to be free of suffering. In this way, mindfulness attends to the suffering of all living beings by cultivating a universal compassion among all who practice. Thus, mindfulness from the Buddhist tradition acknowledges a dynamic and complex interplay between cognitive, affective, social, and ethnical dimensions of human experience.

Beginning in the 1980s, Western scientists and practitioners began to adapt the core elements of Buddhist traditions of mindfulness into non-religious and less esoteric mindfulness-based interventions (MBIs), largely in medical settings, in order to alleviate common forms of physical and emotional pain and suffering (Grossman & van Dam, 2011). While mindfulness in

[1] Middle Indo-Aryan language of Indian subcontinent; classical and liturgical language of Buddhist cannon

[2] Khoury, Sharma, Rush, & Fournier (2015) conducted the most recent meta-analysis of MBSR interventions among healthy individuals. Only one study (out of 29) included in the meta-analysis compared MBSR to an active

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Western medicine and psychology is assumed to generally reflect the Buddhist tradition, tensions arise when attempts to understand and measure mindfulness in psychological research neglect the multiple interacting elements inherent in Buddhist contemplative tradition. "Western psychology mandates that constructs must be explicated and operationalized to be accurately assessed. However, most Buddhist traditions dictate that mindfulness cannot be easily extracted and analyzed in isolation from inherently related concepts" (Grossman & van Dam, 2011, p. 220). As such, there is a significant lack of agreement among scholars about the specific definition of mindfulness.

Kabat-Zinn is often credited as the originator of mindfulness in the West, at least in part due to his skillful distillation of *sati* into a secular practice suitable for medical settings that also retains the philosophical teachings within Buddhist tradition. Kabat-Zinn (2003) defines mindfulness as "an awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment to moment" (p. 2). Thus, Kabat-Zinn acknowledges the qualities of attention and awareness that are cultivated and strengthened through mindfulness meditation, while also emphasizing presence and deliberate action that require active engagement on the part of the meditator. Furthermore, nonjudgment encompasses many qualities such as loving-kindness, tolerance, equanimity, patience, courage, and acceptance (i.e. acknowledgement of "the way things are", Kabat-Zinn, 2003, p. 2) that deepen our concept of mindfulness as an intervention with the capacity to promote profound healing and sustained wellness of the whole person (Grossman & van Dam, 2011).

Western researchers and scholars commonly emphasize one dimension or subset of mindfulness dimensions at a time in order to systematically study its effects. As such, quantitative measures of mindfulness within modern western psychology typically focus on

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mindfulness as a single faceted trait (Chisea, 2013). For instance, the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) conceptualizes mindfulness as *present-centered attention and awareness*. The MAAS has been shown to have good internal consistency and expected convergent and discriminant validity, such that an increase in mindfulness as measured by the MAAS was positively correlated with numerous measures of well-being and negatively correlated with rumination and social anxiety. However, the MAAS does not measure the nonjudgment aspect of mindfulness delineated by Kabat-Zinn (2003). As such, quantitative researchers often include other construct measures related to spirituality and social connectedness in order to present a fuller picture of mindfulness and its potential benefits depending on the purpose of the research study. The present study ultimately measured mindfulness as a single construct related to attention and awareness, but attempted to capture other aspects of mindfulness as well including stress reduction and interpersonal effectiveness. See Chisea (2013) for a full review and discussion of critical issues related to defining mindfulness in research.

Mindfulness-Based Stress Reduction (MBSR)

One of the most frequently cited MBIs in the empirical literature is MBSR, developed by Kabat-Zinn in a behavioral medicine setting for populations with a wide range of chronic pain, traumatic stress, and other stress-related disorders (Kabat-Zinn, 2003). MBSR is the standard from which most other mindfulness training programs and mindfulness-based interventions are derived. Thus, it is useful to know the components of the standard MBSR format in order to better understand the methods by which mindfulness training programs are typically delivered.

MBSR consists of an 8- to 10-week course for groups (up to 30 participants) who meet weekly for 2-2.5 hours for instruction and practice in mindfulness meditation skills. An

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intensive 7-8 hour "retreat" session is also held around the 6th week of the course. Mindfulness meditation skills taught include body scan, sitting meditation, hatha yoga postures, and informal practice during daily activities such as walking and eating. Participants in MSBR are instructed to practice mindfulness skills outside of group meetings for at least 45 minutes per day, six days per week.

Body scans are typically guided by an instructor who asks participants to attend to various parts of their body, usually in a systematic fashion from head to toe, while breathing and gently observing any sensations, thoughts, or emotions that may arise. Sitting meditation requires participants to maintain a comfortable seated position, typically with legs crossed, while guided by an instructor. Instructions during sitting meditation may include a focused attention practice (e.g., continually bringing attention and awareness to the breath), open awareness (e.g., practice an unfocused openness to whatever sensations, thoughts, or emotions that may arise), or loving-kindness (e.g., wishing oneself and others to be healthy and well). Hatha yoga is often characterized as physical mindfulness, represented in a sequence of yoga postures (e.g., sun salutations) infused with focused breathing techniques. Practice examples of all mindfulness skills mentioned above can be easily accessed on the Internet by anyone interested, with reputable institutions such as UCLA Mindful Awareness Research Center (www.marc.ucla.edu) and commercial websites such as Yoga Journal (www.yogajournal.com) offering free content.

Does Mindfulness Work?

Kabat-Zinn (1982) was the first to demonstrate that a structured mindfulness-based stress reduction and relaxation program led to significant reduction in pain, mood disturbance, and psychiatric symptomology among a cohort of chronic pain patients who had not previously improved with traditional medical care. Since Kabat-Zinn's pioneering study, a rapidly

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accumulating body of empirical evidence has emerged to support mindfulness efficacy, not only to reduce stress and stress-related medical symptoms but also to enhance overall emotional well-being and quality of life. The following represents a brief, selective summary of individual qualitative and quantitative studies as well as systematic and meta-analytic reviews of mindfulness research.

Mental health and well-being. Studies investigating the psychometric properties of self-report mindfulness scales, most notably the Mindful Attention and Awareness Scale (MAAS; Brown & Ryan, 2003), Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman & Walach, 2001), and Cognitive and Affective Mindfulness Scale (subsequently revised CAMS-R; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007), have found that naturally-occurring mindfulness levels among individuals, irrespective of formal mindfulness training, are associated with a greater sense of well-being (Greeson, 2008). Baer, Smith, Hopkins, Krietemeyer, and Toney (2006) analyzed several mindfulness questionnaires and derived five facets of mindfulness - observe, describe, act with awareness, non-judgment, and non-reaction. These facets were then correlated with related psychological variables and symptoms among two large samples of undergraduates with little to no meditation experience. Findings supported large, positive correlations ($p<.001$) between the observe facet of mindfulness and openness to experience, the describe facet of mindfulness and emotional intelligence, and the non-reaction facet of mindfulness and self-compassion. Large, negative correlations were also reported: the describe facet of mindfulness with alexithymia; the act with awareness facet of mindfulness with dissociation and absent-mindedness; and the nonjudgmental facet of mindfulness with neuroticism, thought suppression, difficulties with emotion regulation, experiential avoidance, and psychological symptoms such as anxiety and depression (Baer et al., 2006). Brown and Ryan

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(2003) reported similar correlational relationships between naturally-occurring mindfulness and decreased emotional disturbance (i.e. depression, anxiety, negative affect) and increased positive emotions and self-esteem. Moreover, greater mindfulness was associated with increased levels of positive emotions such as joy, vitality, hopefulness, and satisfaction with life (Brown & Ryan, 2003). Further, research suggests that individuals with higher levels of mindfulness show better self-regulation due to greater emotional awareness, understanding of emotional states, acceptance, and the ability to repair unpleasant affective states (Greeson, 2008; Feldman et al., 2007).

Studies of formal mindfulness training programs provide evidence that greater attention, awareness and acceptance cultivated through mindfulness meditation is associated with lower levels of psychological distress (Greeson, 2008). Systematic empirical reviews of published studies of mindfulness-based interventions have concluded that MBIs appear to significantly alleviate a variety of mental health problems and improve psychological functioning among clinical and nonclinical populations (Baer, 2003; Brown, Ryan & Creswell, 2007). Randomized clinical trials of mindfulness-based stress reduction (MBSR) comparing healthy controls to healthy and patient populations show that MBSR is effective in reducing self-reported distress, stress, and mood disturbance (Astin, 1997; Monti et al., 1998; Tacon, McComb, Caldera, & Randolph, 2003; Speca, Carlson, Goodey, & Angen, 2000; Williams, Kolar, Reger, & Pearson, 2001, as cited in Brown, Ryan, & Crewswell, 2007). Significant improvements in state and trait anxiety levels have also been found in 2 randomized controlled trials of MBSR among premedical students, medical students, and therapists in training (Shapiro, Schwartz, & Bonner, 1998; Shapiro, Brown, & Biegel, 2007, as cited by Chisea & Seretti, 2009). Carmody and Baer (2008) observed that individuals who spent more time in formal meditation practice (e.g., body

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scan, yoga, sitting meditation) increased their levels of mindfulness which then led to decreased psychological distress as well as increased psychological well-being.

Several manualized treatments for serious mental health conditions have been developed that involve some form of mindfulness. Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) include formal mindfulness meditation practice as part of the treatment models, while Acceptance and Commitment Therapy (ACT), Dialectical Behavior Therapy (DBT), and Relapse Prevention (RP) incorporate mindful awareness techniques within their treatment models (Baer, 2003). All have been studied extensively as evidence-based treatments of serious mental health disorders including anxiety disorders and depression (MBSR; ACT), recurrent major depression (MCBT), borderline personality disorder (DBT), binge-eating disorder (MBSR) and substance use disorders (RP) (Greeson, 2008). However, it is important to note that MBSR and MBCT are manualized mindfulness-based interventions that have been investigated specifically to determine how mindfulness independently contributed to symptom improvement, as opposed to the influence of other behavior change strategies inherent in ACT, DBT, and RP treatment approaches on symptom improvement (Baer, 2003).

Physical health. A particular thread of mindfulness research focuses on the therapeutic effect of mindfulness training on stress and stress-related medical conditions. This is due to findings in the medical literature over the past 25 years that link psychological stress to a variety of physical health indicators including hypertension, immune responsiveness, and increased susceptibility to infection as well as studies that indicate stress in the exacerbation of certain disease processes, including gastrointestinal disorders and cancer (see brief review by Shigaki, Glass, & Schopp, 2006).

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For instance, psoriasis flare-ups are strongly associated with psychological stress, and two studies of individuals with moderate to severe psoriasis have suggested accelerated healing and skin clearing in patients who participated in mindfulness meditation practice while undergoing skin treatment compared to patients without the mindfulness component to treatment (Bernhard, Kristeller, & Kabat-Zinn, 1988; Kabat-Zinn et al., 1998, as cited by Kabat-Zinn, 2003). Similarly, medical treatment supplemented with mindfulness training has been associated with symptom improvement among individuals with Type 2 diabetes, fibromyalgia, rheumatoid arthritis, chronic lower back pain, attention-deficit hyperactivity disorder, hypertension, myocardial ischemia, binge eating, irritable bowel syndrome, insomnia, human immunodeficiency virus (HIV), and substance abuse disorders including smoking (Greeson, 2008).

A review of mindfulness research highlighted findings from 7 controlled and randomized controlled studies that found that MBSR significantly reduced self-reported stress among otherwise healthy participants (Chisea & Serretti, 2009). Laboratory studies have demonstrated that mindfulness training may positively affect physical health and healing through biological pathways. For example, both healthy participants and those with serious medical conditions such as breast cancer and prostate cancer have shown significant reduction in cortisol levels following participation in MBSR when compared to controls (Greeson, 2008). Meta-analysis of controlled and observational studies of mindfulness training on physical health (results obtained from 203 individuals in randomized controlled studies and 566 individuals in observational studies) revealed a significant medium strength effect size, indicating a trend of findings that mindfulness specifically affects physical health (Grossman, Niemann, Schmidt, & Walach,

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2004). Taken together, there is evidence that mindfulness confers significant physical health benefits and it is theorized that intervention along stress pathways may underlie these benefits.

Interpersonal behavior. Randomized clinical trials and laboratory studies suggest that mindfulness not only improves stress and promotes relaxation, but also supports individual's finding greater meaning in their lives and promotes improved interpersonal relationships. Results from five studies, including three randomized controlled trials and two nonrandomized controlled trials (self-selected and cohort) found that mindfulness was more effective in enhancing self-reported spirituality compared to an inactive treatment (Chisea & Serretti, 2009). Chisea &Serretti (2009) identified several studies that found significant increases in reported empathy among undergraduates and nursing students and one study that reported significant increases in self-compassion among premedical and medical students.

Beddoe and Murphy (2004) found that 63% of participants enrolled in MBSR reported improvements in personal relationships, 75% reported improvements in self-confidence, and 69% reported improvements in assertiveness (Chisea & Seretti, 2009). Dekeyser, Raes, Leijssen, Leysen, and Dewulf (2008) examined the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004, as cited by Dekeyser et al., 2008), a self-report measure of mindfulness consisting of four factors – observe, describe, act with awareness, and nonjudgmental acceptance - and found that all identified factors of mindfulness were positively associated with effective self-expression in social situations. Mindful observation was associated with greater empathy, while mindful description, acting with awareness, and nonjudgmental acceptance were associated with better emotional awareness (i.e., emotion identification and description), less social anxiety, and less distress when confronted with another's negative experiences (i.e., distress contagion).

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In sum, the explosion of mindfulness research since Kabat-Zinn's pioneering study in the early 1980s has established a vibrant research basis for the benefits of intrinsic mindfulness and mindfulness meditation on the human mind, body, and behavior. While the quality and depth of research within each area varies, evidence for mindfulness efficacy can be found for mental health conditions like depression and anxiety, psychological well-being such as emotional awareness and decreased distress, pain and cancer conditions, stress and stress-related medical conditions like psoriasis, and behavioral outcomes related to spirituality and social connectedness. Yet, the mindfulness research field remains relatively nascent, and research is being expanded to new domains each year. Moreover, researchers are becoming increasingly interested in the mechanisms and pathways that underlie the overwhelming evidence of mindfulness benefits in order to strengthen our basic scientific understanding for how mindfulness works.

How Does Mindfulness Work?

Despite the preponderance of evidence from both laboratory studies and clinical trials, the mechanisms that explain how mindfulness leads to improved well-being, symptom reduction, and behavior change are largely unknown. Several pathways that underlie mindfulness and its salutary effects have been proposed, but a strong basis of empirical support is just beginning to emerge.

Ludwig and Kabat-Zinn (2008) suggested nine broad psychological and behavioral pathways by which mindfulness may exert its influence: (1) decreased perception of severe pain, (2) increased ability to tolerate pain, (3) reduced stress, anxiety, or depression, (4) reduced use of medication (and thus reduced side effects from medication use), (5) enhanced ability to reflect on

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medical treatment choices, (6) improved adherence to medical treatments, (8) improved interpersonal relationships and social connectedness, and (9) alterations in biological pathways affecting health (i.e., autonomic nervous system, neuroendocrine function, and immunity). These broad pathways are extrapolated from areas of strong research evidence for mindfulness efficacy across studies, summarized briefly in the section above.

Baer (2003) proposed exposure, cognitive change, self-management, relaxation, and acceptance as potential mechanisms for mindfulness efficacy. Consider that during sitting meditation, participants may experience discomfort or even pain in muscles and joints as a result of prolonged sessions of motionlessness. Mindfulness teachers often instruct participants to avoid shifting positions to relieve pain, but rather focus carefully on pain sensations and cultivate non-judgment. This mindful response to pain is in stark contrast to reflexive emotional reactions like anxiety or anger and ruminative cognitions such as "I am suffering, this pain is unbearable" that tend to automatically arise in response to pain sensations. The *exposure* to pain sensations that do not lead to suffering, that is cognitive and emotional distress above and beyond the pain sensation itself, is thought to lead to desensitization to pain within the meditator (Baer, 2003). Thus mindfulness affords the meditator exposure to pain that is not further catastrophized, which may result in decreased perception of pain and increased ability to tolerate pain over time, as outlined by Ludwig and Kabat-Zinn (2008). Furthermore, the benefits to exposure and resulting desensitization to physical pain, particularly when guided by a mindfulness teacher, can be generalized to emotional, intrapsychic, and interpersonal pain experiences (i.e. social anxiety or exclusion) that inevitably arise in daily life.

The mechanistic relationship between mindfulness and relaxation is somewhat paradoxical for mindfulness researchers (Baer, 2003). On the one hand, MBSR has been shown

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to be particularly efficacious for stress-related medical disorders. Mindfulness has been noted to induce relaxation experimentally and thus marketed as a stress-reduction technique for laypersons (Headspace, 2018). Yet, on the other hand, relaxation is not the purpose of mindfulness training. Rather, mindfulness is taught as an active attention and awareness technique from which increased relaxation and emotion regulation are welcome by-products.

Brown, Ryan and Creswell (2007) focus on the role of attention as a skill directly impacted by mindfulness training and suggest pathways by which increased attention to experience leads to many of the observed benefits of mindfulness. Within this framework, improved attention is emphasized as a cognitive skill that enhances self-regulation. Mindfulness training affords the meditator greater awareness and attentional control, which may lead to better sensitivity to psychological, somatic, and environmental cues (Brown, Ryan, & Crewsell, 2007). In terms of mental health, greater attention to psychological cues is thought to engender less automatic responses to crises and conflicts, particularly as it relates to rumination and unhealthy habitual responses to pain (i.e., substance abuse).

Importantly, one must consider that increased attention to psychological, somatic, and environmental information may *increase* distress by increasing salience of symptomology, for example (Brown, Ryan, & Crewsell, 2007). Coping strategies related to distraction and avoidance are often useful strategies for coping with unwanted sensations, particularly for mild conditions. Nevertheless, mindfulness proponents emphasize that in many cases, it is often inattention or avoidance to cues that leads to the most serious mental, physical, and interpersonal health consequences. Therefore, the benefits to improved attention and self-monitoring are thought to be largely salutary for meditators, particularly as they gain wisdom and experience through practice. Furthermore, in terms of mechanisms of action, awareness, attention, and

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attentional control appear to be important cognitive skills that are directly trained during mindfulness meditation. These cognitive skills play an important role in self-management and emotion regulation functions that have also been highlighted as likely contributors to mindfulness health benefits.

Attention and emotion regulation represent the most commonly addressed potential pathways underlying the effects of mindfulness practice. Chisea, Serretti, Jakobsen (2013) conceptualized a top-down versus bottom-up emotion regulation strategy to encompass the proposed mechanisms of action for mindfulness. A top-down regulation strategy highlights mindfulness effects on cognitive functions of the prefrontal cortex such as enhanced cognitive reappraisal (i.e. a pain sensation is labeled neither good nor bad, but accepted as the way things are). Improved functioning of the prefrontal cortex may also lead to greater regulation of emotion-related brain regions such as the amygdala, thereby influencing automatic emotion-related patterns such as anxiety and stress. A bottom-up regulation strategy involves direct modulation of brain regions such as the amygdala and the encompassing limbic system without active engagement of the prefrontal cortex. Action at this "lower" site of brain functioning is thought to result in less reactivity to unpleasant stimuli, both external and internal. Ultimately, by way of either strategy (or some integration of both), the meditator is poised to better interact with his environment and himself, and cultivate a greater acceptance of the human experience.

Mindfulness in Medicine

As mindfulness has become widely researched and better understood scientifically, the meditative practice has simultaneously exploded in popularity among the general public and within the collective consciousness. Mindfulness is now taught in various institutional settings

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ranging from corporate business organizations to prisons. Mindfulness interventions developed for medical trainees and physicians have gained particular momentum.

One survey found that, among the 140 accredited medical schools in the United States, the majority (79%) provided mindfulness-related activities to their students (Barnes, Hattan, Black, & Schuman-Olivier, 2016). Most activities consisted of wellness programs (e.g., drop-in mindfulness groups; 62%) and research opportunities (e.g., participating in a MBSR course for scientific research purposes; 49%). About 1/3 of medical schools integrated mindfulness into the medical education curriculum, and another 1/3 of programs offered mindfulness-based interventions in clinical settings. Medical schools use a wide range of formats for teaching mindfulness in order to suit the demanding time schedules of medical trainees, with formats including: simple lectures, 1-day workshops, and 8-10 week evidence-based programs in mindfulness-based stress reduction. Most medical schools that teach mindfulness to their trainees also evaluate their programs and contribute these findings to the scientific knowledge base.

"Implicitly, at least, mindfulness has always been part of good medical practice, facilitating the physician's compassionate engagement with the patient" (Ludwig & Kabat-Zinn, 2008, p. 1351). Health care practitioners who participate in mindfulness courses have reported improved empathy, less professional burnout, increased quality of life, improved ability to be attentive and listen deeply to patients' concerns, and improved ability to be with suffering or manage end-of-life care (Ludwig & Kabat-Zinn, 2008). In lay talks, Kabat-Zinn emphasized the importance of mindfulness teachers practicing mindfulness themselves. In this way, physicians who practice mindfulness and gain benefits from its use are thought to more effectively prescribe mindfulness tools that promote healing and recovery to their patients. Furthermore, Ludwig and Kabat-Zinn (2008) proposed that, beyond the physical, well-being, and cognitive benefits,

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mindfulness leads to enriched interpersonal relationships and social connectedness. Thus, our understanding of the relationship between mindfulness and medicine deepens if we consider that beyond its usefulness to the physician and patient in his or her own personal practice, mindfulness promotes healing by (1) improving the social-emotional competence of physicians and (2) enriching the patient-physician relationship.

This consideration becomes especially poignant when addressing the problem of rampant discontent among physicians about the present state of the medical profession. In mid-2014, Sandeep Juhar M.D. made waves in the healthcare field when he wrote frankly about physicians' disillusionment with the state of their once highly esteemed profession. Writing for the Wall Street Journal in advance of the release of his book, Juhar (2014) outlined the numerous factors that have led the *majority* of physicians to report that they would actively discourage their friends and family members from entering medicine. Juhar (2014) juxtaposed today's doctors' diminished enthusiasm for medicine with the loss of status that the medical profession has undergone since its heyday in the 1950s. He highlights the ambition and sacrifices of both time and money that doctors make to complete their training, only to discover that the ideals and expertise of the medical profession have been eroded by managed care and WebMD. Beyond the virtue of self-study and introspection of the profession, Juhar emphasized that this trend is devastating the quality of patient health care in the United States. In a time of bitter embattlement over universal healthcare in the federal government, such vocal expression of discontent by American physicians ought not to be ignored.

At least in part, mindfulness programs in medical schools have sprouted up across the U.S., Canada, and Australia as a vehicle for clinical intervention services due to the pervasive issue of physician disillusionment as mentioned above, as well as other concerns such as

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professional burnout and concomitant mental health risks including depression, substance abuse, and suicide (Gundersen, 2001).

Why Doctors are Sick of Their Profession

In common parlance, burnout is understood to describe mental weariness. *Professional burnout*, however, represents a well-described and scientifically operationalized construct within occupational health, reflecting a cumulative stress reaction to overwhelming job demands (Maslach & Schaufeli, 1993; Maslach, Schaufeli, & Leiter, 2001). Thoroughly delineated in the research literature across several decades, burnout consists of three dimensions: exhaustion, cynicism, and personal inefficacy. The first dimension – exhaustion – measures fatigue as a result of job demands and represents the basic individual stress response to work (Leiter & Maslach, 2003). Exhaustion is considered the central quality of burnout and its most obvious manifestation (Maslach, Schaufeli, & Leiter, 2001). Of the three aspects of burnout, exhaustion is the most systematically analyzed and commonly reported in the research literature. Thus, exhaustion is considered a necessary criterion for burnout (Maslach, Schaufeli, & Leiter, 2001). Furthermore, exhaustion is theorized to influence cynicism and personal efficacy, with the latter two dimensions capturing the quality of one's relationship to work. Cynicism reflects indifference or a distant attitude toward one's work (emotionally and cognitively). Within the human service field, depersonalization is often substituted for cynicism in the definition of burnout to reflect the tendency to ignore the aspects of clients that make them uniquely human in order to maintain emotional and cognitive distance. Personal inefficacy, the third component of burnout, reflects a negative self-evaluation wherein one experiences pervasive feelings of incompetence or lack of achievement and productivity in work (Leither & Maslach, 2003).

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Chronic, overwhelming job demands that lead to exhaustion and cynicism will likely erode one's sense of personal efficacy.

An important caveat to burnout research is that there exists no consensual diagnostic criteria for burnout (e.g., job burnout is not listed in the American Psychological Association's Diagnostic and Statistical Manual – 5th edition). Schonfeld and Bianchi (2016) discussed the significant overlap between job-related burnout, particularly on the emotional exhaustion dimension, and major depressive disorder. Essentially, this argument stipulates that symptoms such as high exhaustion (i.e., "I feel tired/exhausted most of the time") may be better conceptualized in terms of clinical diagnostic criteria for disorders such as major depressive disorder (i.e., sleep disturbance). Job burnout was originally conceived as a mild degree of stress-induced unhappiness, such that severe stress-induced exhaustion, cynicism, and dissatisfaction in word has a broader implication on one's overall well-being and mental state, beyond the job context. Nevertheless, job burnout continues to be a highly-studied construct of stress among workers, particularly in the health professions, and garners great interest in wellness models of physician training.

In a study of medical students in the U.S., burnout was present in 45% of respondents (239 of 545 respondents; Dyrbye et al., 2006). In the same study, while the frequency of depression and at-risk alcohol use was found to decrease among senior medical students, the frequency of burnout increased (Dyrbye et al., 2006). Studies have reported burnout to be about 75% among medical residents (Shanafelt, Bradley, Wlpf, & Back, 2002; Ripp et al., 2011). Rates range from 25-60% among practicing physicians across specialties, with the highest rates occurring among emergency medicine and primary care physicians (Linzer et al., 2014; Houkes, Winants, Twellaar, & Verdonk, 2011). A national survey of medical students, residents/fellows,

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and early career physicians (<5 years in practice) revealed that all were more likely to report job burnout than a probability-based sample of the general U.S. population (Dyrbye et al., 2014).

Predictors of job burnout within the medical profession include excessive work hours, loan debt, work-home conflict, a variety of personality traits (e.g., self-destructive tendency, depression, guilty self-concept), limited emotional support, fatigue due to sleep deprivation, and perceived inferiority of one's clinical judgment and skills (Gundersen, 2001). The consequences of physician burnout can include depression, suicide risk, substance abuse and dependence, suboptimal patient care, and self-perceived medical errors (Dobkin & Hutchinson, 2010; Dumitrascu, Mannes, Gamble, & Selzer, 2014; Lacy & Chan, 2018; McCall, 2001; Schernhammer, 2005; Shanafelt et al., 2002; West, Tan, Habermann, Sloan, & Shanafelt, 2009).

A study of 178 matched pairs of patients hospitalized within the previous year and their treating physicians found that the cynicism dimension of physician burnout was associated with lower satisfaction and longer post discharge recovery time among patients (Halbesleben & Rathert, 2008). Groopman (2007) suggests that most medical errors and misdiagnoses do not occur due to lack of knowledge but from cognitive errors that can be avoided by paying closer attention to the processes of thinking. Enhanced metacognition may help the physician avoid faulty thinking such as making snap judgments and attribution errors. Indeed, the effects of mindfulness on attention and reduced stress may prove to be an important factor in promoting wellness and job satisfaction among medical trainees and physicians.

Daya & Hearn (2018) provided a synthesized review of the impact of any type of mindfulness-based intervention (MBI) on medical student stress, depression, fatigue and burnout. Of the 831 articles generated during an initial search of MBIs and medical students, the authors included 10 studies for full review based on the following inclusion criteria: full

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description of mindfulness intervention, inclusion of at least one of the four outcome measures of interest, quantitative outcomes, and English language. Four of the seven studies measuring stress as an outcome measure found improvements in stress among students, two studies reported no change, and one study, which took measurements one year post-intervention, reported an increase in stress. Additionally, the authors reviewed three studies that measured the effects of mindfulness on burnout in medical students. Two of these studies reported no significant reductions in burnout, while the third reported a significant improvement in the emotional exhaustion component of burnout. Overall, the authors noted greater support for mindfulness-based interventions efficacy in reducing stress, depression, and burnout among medical students.

Irving, Dobkin, and Park (2009) reviewed empirical studies of mindfulness-based stress reduction (MBSR) among various healthcare professionals. The authors reported on 10 relevant quantitative studies among premedical and medical students and practicing physicians, as well as trainees and clinicians in related professions such as nursing, psychology, and hospital administrators whose work involved patient care. MBSR programs demonstrated positive effects on self-report measurements of psychological symptoms such as anxiety and depression, as well as improvements in empathy and spirituality. Several of the studies used a shortened MBSR program (i.e. 4-weeks) that revealed comparable results to the standard 8-week MBSR program. MBSR showed efficacy in decreasing distress and anxiety related symptoms such as ruminative thoughts. Generally, participants reported significantly lower levels of perceived stress and increases in ratings of self-compassion. One intriguing study of MBSR among psychotherapy trainees found that those involved in the mindfulness intervention received higher evaluations on measures of therapeutic alliance, problem-solving, and communication from their patients.

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Patients of the trainees in the mindfulness group also reported greater symptom reduction by self-report measures.

Many investigators have explored shortened or modified MBSR programs in order to appeal to professionals who might already be experiencing burnout and therefore reticent to make the substantial time commitment necessary for the standard MBSR course (i.e., 2-2.5 hours per week for 8-10 weeks with an additional 8 hour retreat; total class time 24 – 33 hours). Promising findings from one pilot study of abbreviated MBSR on burnout among pediatric oncology staff suggest that as little as 15 hours of total MBSR class time may significantly reduce burnout, perceived stress, and depression among participants (Moody et al., 2013). The present study will use a modified format, similar in length to Moody et al. (2013), yet tailored to address the specific concerns of medical students (e.g., increased sustained attention for studying, greater feelings of self-efficacy).

An additional aim of the present research it to investigate whether mindfulness might impact social connectedness and interpersonal effectiveness, a pathway proposed by Ludwig and Kabat-Zinn (2008). Future physicians must manage their stress not only to protect against burnout but also to promote wellness in themselves and their future patients. Mindfulness may serve an additional function among medical students and trainees seeking to bolster their professional competencies, better connect with their future patients to improve patient care and outcomes, and preserve the deep meaning and satisfaction that comes from the aspiration to become a healer, that is, relieving pain and suffering in others. Teaching future doctors how to better connect with other humans is imperative for the future of the field.

Social cognition has emerged as a broad subfield of psychology and neuroscience that captures the complex set of cognitive processes that underlie social connectedness and allow

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humans to understand others' behaviors, intentions, beliefs, and desires (fundamental papers include Amodio & Frith, 2006; Gallese, 2007; Saxe, 2006; Solms & Turnbull, 2002). The foundation of social cognition rests on the evolutionary theory that human survival depends on effective social functioning. Thus, humans are theorized to have uniquely evolved to develop social skills that facilitate access to food, protection and reproductive partners. Moreover, socially adept individuals tend to be healthier and live longer than less socially adept individuals (Cohen, 2004). Greater social-emotional maturity has been found to underlie older adults' report of greater life satisfaction and richer social relationships than younger adults (Luong, Charles, & Fingerman, 2011).

Bargh (1997) contributed significantly to our understanding of social cognition by stating that "much of everyday life – thinking, feeling, and doing – is automatic in that it is driven by current features of the environment (i.e., people, objects, behaviors of others, settings, roles, norms, etc.) as mediated by automatic cognitive processing of those features…" (p. 2). Many theorists since have taken up Bargh's view of the automaticity of human behavior, as governed by automatic processes in the social and cognitive domain. The consequence of such automatic processing is that concepts, labels, ideas, and judgments are imposed on everything that is encountered, continually impinging on human flexibility and reflection about thoughts and feelings. Mindfulness is often conceptualized as an antidote to automaticity (Kang, Gruber, & Gray, 2013). In a mindful mode of cognitive processing, attention is developed in order register only observable facts. The mind is trained to remain receptive and non-judgmental. Mindfulness cultivates an awareness of internal and external stimuli as simply phenomena of a moment-to-moment experience, rather than objects of a pre-constructed schema of the world. Given Bragh's concept of the automaticity of human social behavior, the mindfulness construct may be useful

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for understanding how de-automatized cognitive and affective processes may result in better social functioning.

Mindfulness, social cognition, Theory of mind (ToM), emotional intelligence, mind reading, empathy, and metacognition have all been implicated as "conceptual cousins"(Choi-Kaan & Gunderson, 2008). In order to make a preliminary foray into measuring social cognition, affective ToM and Emotional Intelligence (EI) were chosen as variables of study in addition to student burnout. Affective ToM and EI constructs are theoretically related to social cognition and include useful modes of measurement suitable for the target medical trainee population of this study.

Affective Theory of Mind. Theory of mind refers to a set of abilities, typically cultivated in a developmental process, that are needed to accurately attribute mental states to others and to describe, explain, and predict others' behaviors on the basis of their mental states (Dennis et al., 2012; Poletti, Enrici, & Adenzato, 2012). It is an interdisciplinary theory derived from developmental neuroscience, attachment theory, cognitive psychology, and philosophy that offers an etiology of social cognition as well as a potential mode for understanding individual differences and pathological deficits in human social behavior. Abnormalities in the ability to understand others minds are key features to disorders such as autism spectrum disorders, borderline personality disorder, and neurodegenerative diseases like Alzheimer's disease and dementia. Several experimental paradigms have been demonstrated to reveal the developmental process of Theory of Mind, as well as reveal deficits in adulthood (Baron-Cohen, 2000). As such, Theory of Mind represents a complex but well-articulated, interdisciplinary theory of social cognition that generates testable hypotheses and up-to-date empirical evidence of its mechanisms.

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Two neural systems are thought to be involved in Theory of Mind: one processing others' beliefs and intentions (cognitive Theory of Mind) and one processing others' emotions and feelings (affective Theory of Mind). Performance on affective Theory of Mind tasks has been shown to be positively related to empathic ability. Shamay-Tsoory, Tomer, Yaniv, & Aharon-Peretz (2002) showed that errors on an affective Theory of Mind task (e.g., social-faux pas and irony paradigm) were made due to an inability to make emotional representations and did not correlate with a general (cognitive) Theory of Mind impairment. Thus, affective Theory of mind usually refers to the human ability to understand the mental state of oneself and others that underlies overt behavior (Bateman & Fonagy, 2012), and thereby a useful construct for measuring social cognition and social connectedness ability.

Emotional intelligence. EI is a type of intelligence that can be reliably distinguished from other types of intelligence abilities (Mayer, Salovey, & Caruso, 2008). EI refers to the ability to reason validly about emotions and then use emotions in the reasoning process. Theorists agree that intelligence (g) is best defined as a single, general mental ability factor. Yet, this general factor may also be divided into more specific mental ability factors that further describe the nature of intelligence. One dominant approach, typified in everyday psychological testing protocols, divides intelligence into information areas. The traditional dichotomy divides general intelligence into verbal ability and perceptual ability. However, theorists and researchers have increasingly sought to demonstrate a social intelligence to complement verbal and perceptual abilities. This social intelligence (ability EI) refers to the specific ability to reason with and about emotions. Thus, EI has been considered a specific mental ability factor of general intelligence.

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Mayer, Salovey, and Caruso (2008) also assert that EI is a highly evolved signaling system, grounding it in Darwinian evolutionary theory and further aligning the concept with basic human science. Thus, emotions serve an important function for communication signaling between humans that directly impacts adaptation and survival. EI can be roughly subdivided into four categories that include the abilities to: (1) manage emotions in order to achieve specific goals, (2) understand emotions, emotional language, and the signals conveyed by emotions, (3) use emotions to facilitate cognition, (4) recognize emotions accurately in oneself and others.

Emotional intelligence incorporates the complexity of a person's capabilities in knowing and handling one's own and others' emotions into a theoretical structure for the organization of personality (also called social intelligence). EI extends social intelligence into action, utilizing a "competency" approach that identifies the learned abilities that are theorized to result in outstanding academic or work performance. Evidence supporting the relationship between emotional intelligence and academic success is mixed (Barchard, 2003; Brackett, Rivers, & Salovey, 2011). While more research is needed to understand whether and how EI relates to academic performance, there is evidence that emotional intelligence may at least influence other aspects of student performance in school that positively impacts overall performance. Aspects of EI contribute to optimal social functioning since the accurate and ongoing perception of others' emotions underpin adaptation to developing social and emotional situations. In addition, managing one's own emotions effectively makes possible the expression of socially appropriate emotions and behavior. The relationship between mindfulness and emotional intelligence is currently being investigated, with strong preliminary evidence suggesting that EI may mediate the relationship between mindful awareness and subjective well-being (Schutte & Malouff, 2011; Bao, Xue, & Kong, 2015).

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The Present Study

Medical students and practicing physicians make up a distinct at-risk population, significantly more likely to experience professional burnout and related health and psychological risk factors than others in the general workforce. Mindfulness-based interventions have been readily adopted by medical training programs as stress and burnout intervention programs that show promising efficacy among healthcare professionals. Mindfulness-Based Stress Reduction, MBSR, in particular has a research basis demonstrating efficacy at improving health outcomes and overall well-being among clinical populations suffering from a myriad of disorders (i.e., chronic pain, depression) and among healthy individuals experiencing stress. Beyond its stress reduction techniques, MBSR purports to develop the mindfulness construct itself – hypothesized to act as an antidote to the automaticity of human social cognitive functioning. By developing a keen sense of attention to observable facts, an awareness of moment-to-moment experience, and attempting to free oneself of judgments (i.e. good/bad; healthy/unhealthy), participants in MBSR report a more receptive state of mind that allows them to develop a greater presence with those around them and improve their social relationships. Medical students are preparing to enter demanding work environments that require superior expertise in science-related subjects as well as keen understanding of the human condition. Mindfulness may be a fundamental construct that not only facilitates greater physical and psychological well-being but also engenders a deeper understanding of self and others.

In the present study, student participants were assigned to one of three conditions: an 8-week, modified-MBSR course, an 8-week general stress reduction course, and an 8-week waitlist control group. After the 8-week intervention phase, participants were measured on their levels of mindfulness, student burnout, affective Theory of Mind, and emotional intelligence. It was

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hypothesized that that participants in the modified-MBSR course would report significantly lower levels of burnout than participants in the general stress reduction course and waitlist control groups post-intervention. It was also hypothesized that participants in the MBSR course would exhibit greater levels of mindfulness post-intervention, and that mindfulness intervention would result in greater affective Theory of Mind and emotional intelligence among MBSR course participants. Ultimately, the present study sought to test whether an abbreviated-MBSR course could significantly influence a risk factor to medical trainee wellness (i.e., burnout) as well as improve social cognitive functions (i.e., mindfulness, theory of mind, and emotional intelligence) necessary for medical trainee's academic and professional success.

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Chapter 3: Methodology

Participants.

Study participants were drawn from pre-medical and medical students enrolled in the Sophie Davis Biomedical Education program within The City College of New York (CCNY) in Harlem, New York during 2016. Participants were recruited using flyers, posters, broadcast emails, and in-person methods. Flyers and posters were approved by the CUNY Institutional Review Board (IRB) and included pertinent information about the research study and contact information for the primary investigator and research assistant. Sophie Davis Dean of Students Danny McBride consented to send broadcast emails to eligible students containing study information (this recruitment method was also IRB-approved). In-person methods included tabling events in the student common area where the primary investigator and research assistant were available to explain the study aims and participation requirements to eligible students.

Inclusion/Exclusion Criteria. In order to be eligible for this study, participants indicated that they were: CCNY undergraduate students registered as pre-medicine majors and/or enrolled in the Sophie Davis School of Biomedical Education, at least 18 years old, willing and able to participate in an 8-week mindfulness course and complete all study measures, and reasonably physically and psychologically stable and well (Appendix A). Participants were excluded from the study if they indicated that they had received emergency medical or psychiatric treatment 4 weeks prior to the recruitment phase or that they suffered from an acute medical or psychiatric complaint for which they are receiving active treatment (e.g., first course of medication, surgery). Finally, participants who have already completed an organized 8-week mindfulness course, of any kind, were excluded from the present study.

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Recruitment and Group Assignment. See Figure 1 for a recruitment flow chart. Sixty-one pre-medical students were recruited, pre-screened, and consented to participate in this study. Recruited students were then assigned to the intervention treatment condition (modified-mindfulness stress reduction – MMBSR), active control condition (general stress reduction student group - SRSG), or a waitlist control condition (BIG) using a computerized block randomization sequence technique to balance group size across conditions. Students assigned to the MMBSR or SRSG condition were then informed of the day/time/location of the group sessions. As part of the pre-screening and informed consent process, students were made aware of all possible session times and asked to commit to attending whichever group they were assigned. Nevertheless, 20 (32%) of recruited students declined to participate in the study after random assignment. An exit survey was sent to all recruited students who had later left the study before its completion. Nine recruits responded to the exit survey and the majority (77.78%) indicated that a time/day conflict, particularly with a specific class (Anatomy and Biology Lab) was the reason that they were unable to participate. There was no significant difference in dropout rates across intervention (χ^2= 4.01, p=.135; see Table 1). However, this may be a function of power, as it appears that students assigned to the SRSG group showed the largest dropout rate.

Sample characterization. The current study includes data from 40 participants who consented to the present research, participated in their assigned treatment condition, and completed all study measures. Full demographic characteristics for the sample are presented in Table 2 and briefly summarized below.

The majority of participants were female and approximately 19 years old. Most of the participants self-identified as Asian/Pacific-Islander, with the next largest groups identifying as

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Black/African-American, White/Caucasian, and American Indian/Alaskan Native, respectively. A minority of participants (~15%) identified as Hispanic. Most participants self-identified as U.S. Born, with English as their preferred language.

Roughly half the sample reported high parental education levels: about 60% of participants reported that their father had obtained a Bachelor's degree or higher, while somewhat fewer participants (~40%) reported that their mother had obtained a Bachelor's degree or higher. In terms of family income, the sample was roughly split with half of respondents reporting family income greater than $70,000 annually and the other half reporting family income less than $69,999 annually. However, the majority of participants reported family income at either extreme (e.g., less than $35,000 and greater than $100,000 annually). Understandably, as they were currently undergraduate students, the vast majority of participants reported a personal income of less than $2,000 annually.

Finally, nearly half the respondents reported a Christian religious affiliation, while nearly 1/3 reported Muslim and Buddhist affiliation. The remaining participants indicated Hindu, Other, Atheist, and Jewish religious affiliation, respectively.

Intervention Groups

Of the 40 total study participants, 16 participated in the modified-mindfulness based stress reduction course (MMBSR), 10 participated in the general stress reduction course (SRSG), and 14 were assigned to the control group (BIG).

Modified-Mindfulness Based Stress Reduction (MMBSR). The MMBSR course was adapted from the traditional MBSR course offered by Jon Kabat-Zinn at the University of Massachusetts Medical School. Refer to Appendix A for a table comparison of the MMBSR course delivered in the present study and a traditional MBSR course.

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The traditional MBSR course is known for the substantial time commitment required for training (e.g., 2-2.5 hours per week for 8-10 weeks with an additional 8 hour retreat; total class time 24 – 33 hours). Based on promising findings from studies of abbreviated MBSR (e.g., Moody et al., 2013), the present study used a modified-MBSR format that reduced the class time substantially (13 hours total), in order to be more appealing to busy premedical and medical students. The current MMBSR intervention consisted of 1-hour weekly sessions over the course of 8 weeks, plus a 5-hour mindfulness retreat to be held at CCNY on a weekend around week 6. MMBSR participants were encouraged, but not required, to practice mindfulness at-home (10-20 minutes per session) using the Headspace mobile app, which was provided free of charge.

Like the traditional course, MMBSR course sessions were led by a mindfulness-based stress reduction (MBSR) certified instructor. Participants received training in the following meditative practices, adapted from the original MBSR course: (1) sitting meditation, involving awareness of body sensations, thoughts, and emotions while continually returning the focus of attention to the breath; (2) body scan, a progressive movement of attention through the body from toes to head, observing any sensations in the different regions of the body; (3) Hatha yoga, which consists of stretches and postures designed to enhance greater awareness of and to balance and strengthen the musculoskeletal system, (4) walking meditation, which uses the experience of walking as the focus of awareness, (5) speaking/listening meditation, which focuses awareness on the use of speech and silence in one's interactions with others, and finally (6) loving-kindness meditation, which helps participants develop greater compassion for those around them, particularly future patients they are training to help.

Stress Reduction Student Group (SRSG). The SRSG intervention consisted of 1-hour weekly sessions over the course of 8 weeks concurrent with the MMBSR intervention. A

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handbook for the SRSG intervention was developed by the researcher and instructor Ms. Karan, specifically for use in the present study (Appendix B). Each week introduced a topic (e.g., What is Stress? How Can I Manage It?), presented psychoeducation on the topic, and included activities and prompts for group discussion. Other weekly topics included homework and studying tips, avoiding distractions (including drug and alcohol misuse), and work-life balance discussions for medical school, residency, and beyond. Two weeks included student-led discussion based on students stated interest on the topic of stress reduction. References for the handbook were culled from online sources, as well as researcher and instructor expertise on the topic.

Waitlist control group. The participants assigned to the waitlist control condition did not participate in any organized treatment during the intervention phase of the study. They were reminded to return during in 8 weeks to complete the study measures. At that time, participants received information about mindfulness, mindfulness meditation techniques, and a free trial of the Headspace meditation application. Participants were also encouraged to attend subsequent mindfulness sessions held after the study period on campus (schedule provided to participants).

Instructors. Alison Cohen, MST served as the modified-MBSR instructor for this study. At the time of this study, Ms. Cohen had completed the Teacher Development Intensive and obtained the minimum qualifications for beginning to solo teach complete MBSR courses (Appendix C). Esen Karan, M.S., a clinical psychology doctoral candidate, served as the general stress reduction instructor for this study.

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Measures

Participants completed the following measures at one time point, during the Measurement Phase. All measures were administered using a computerized, online platform. Total assessment time estimated 1 hour, 35 minutes.

Mindful Attention Awareness Scale. The trait MAAS is a 15-item scale designed to assess a core characteristic of mindfulness, namely, a receptive state of mind in which attention, informed by a sensitive awareness of what is occurring in the present, simply observes what is taking place. This is in contrast to the conceptually driven mode of processing, in which events and experiences are filtered through cognitive appraisals, evaluations, memories, beliefs, and other forms of cognitive manipulation. Across many studies conducted since 2003, the trait MAAS has shown excellent psychometric properties. Factor analyses with undergraduate, community and nationally sampled adult, and adult cancer populations have confirmed a single factor scale structure (Brown & Ryan, 2003). Internal consistency levels (Cronbach's alphas) generally range from .80 to .90. The MAAS has demonstrated high test-retest reliability, discriminant and convergent validity, known-groups validity, and criterion validity. Correlational, quasi-experimental, and experimental studies have shown that the trait MAAS taps a unique quality of consciousness that is related to, and predictive of, a variety of emotion regulation, behavior regulation, interpersonal, and well-being phenomena. The measure takes 5 minutes or less to complete. Internal consistency levels for the Mindful Attention Awareness Scale (MAAS) generally range from .80 to .90 (Brown & Ryan, 2003). Analysis of MAAS responses in the present study revealed Cronbach's alpha of .85, indicating good internal consistency

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Maslach Burnout Inventory-Student Survey (MBI-SS). The Maslach Burnout Inventory**,** a 16-item self-report questionnaire, is the most widely used measure of professional "burnout". The measure takes 5 minutes or less to complete. The concept of burnout was first used to describe a syndrome of mental weariness specifically observed among human service professionals but has later expanded to include all types of professions and occupational groups. Similarly, the Maslach Burnout Inventory – General Survey (MBI-GS) has been adapted to study burnout outside the professional context – in the case among students (e.g., instead of 'I feel emotionally drained from my *work'*, 'I feel emotionally drained from my *studies*). The MBI-SS was first adapted by Schaufeli, Martinez, Pinto, Salanova, and Bakker in 2002 and modified to its current version in 2012.

Factor analyses of the MBI-GS and MBI-SS have confirmed a three-dimension structure that includes exhaustion (EX), cynicism (CY) and personal efficacy (PE). High scores of EX and CY and low scores on PE indicate burnout (i.e. all PE items are reversibly scored because there is an inverse relationship between PE and burnout). Good internal reliability has been established for the MBI-GS, with Cronbach alpha ratings of .9 for emotional exhaustion, .76 for depersonalization, and .76 for personal accomplishment (Schaufeli et al., 2002). However, internal consistencies for the MBI-SS have been shown to be variable, with Cronbach alpha ratings ranging from .65-.85 for EX, .79-.86 for CY, and .65-.76 for PE (Schaufeli et al., 2002). In the present sample, Cronbach's alpha for exhaustion was 0.83, cynicism was 0.77, and personal efficacy was 0.73, indicating good internal consistency.

Yoni Task. The Yoni task (Shamay-Tsoory & Aharon-Peretz, 2007; Poletti, Enrici, & Adenzato, 2012) is a widely used, computerized experimental task of Theory of Mind (ToM). The task consists of 64 trials, wherein participants are introduced to an animated face named

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'Yoni' in the middle of a computer screen, with four color pictures in the corners showing either faces and/or objects (e.g., fruits, animals). Participants must evaluate what Yoni might be referencing as various pictures populate the screen. The items correspond to three types of categories: affective ToM, cognitive ToM, and control conditions. The choices in the affective and cognitive ToM conditions imply mentalizing based on verbal cues contained in the sentence, eye gaze, and/or facial expression. Items in the control condition only require an analysis of the character's physical attributes. Participants will complete all three conditions. Participants' accuracy will be measured using the provided computer software scoring assistant and compared across treatment groups. Yoni assessment time estimated 10 minutes, 30 seconds.

The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT v2.0). The MSCEIT (Mayer, Salovey, Caruso, & Sitarenios 2003) is a performance test of emotional intelligence (EI) designed to measure the following four branches (specific skills) of EI: (a) perceiving emotions, (b) using emotions to facilitate thought, (c) understanding emotions, and (d) managing emotions. A performance test provides an estimate of a person's ability by having them solve problems. The MSCEIT asks the participant to solve problems about emotions, or problems that require the use of emotion. The test consists of 141 items and yields a total emotional intelligence score and 14 other subsidiary scores. The total emotional intelligence score will be used in data analysis for this study. The MSCEIT scores are reported like traditional intelligence scales so that the average score is 100 and the standard deviation is 15. The reliability of the MSCEIT at the total scale level has been shown to be good, with split-half reliabilities ranging from r = .93 to .91 (Mayer et al., 2003; Palmer, Gignac, Manocha, & Stough, 2005), and the test is currently the most widely recognized measure of EI in the research literature (O'Boyle, Humphrey, Pollack, Hawver, & Story, 2011). In the present study, pre-

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scored reports of MSCEIT data for all participants were obtained from Multi-Health Systems, Inc. (MHS).

Research Hypotheses

It was hypothesized that the mean scores of the modified-mindfulness based stress reduction (MMBSR) group participants would be significantly (0.05 alpha level) higher than the waitlist control group (WCG) on all measures. It was hypothesized that the general stress reduction group participants (SRSG) would serve as an active control group and score significantly higher than the WCG participants but significantly lower than MMBSR participants. Please note that these are average group scores.

(1) Mindfulness (MAAS) score among mindfulness group (MMBSR) > MAAS score among general stress reduction group (SRSG) > MAAS score among waitlist control group (WCG)

(2) Student burnout (MBI-SS) score among MMBSR > MBI-SS score among SRSG > MBI-SS among WCG

(3) Affective Theory of Mind (Yoni) accuracy score among MMBSR > Yoni accuracy score among SRSG > Yoni accuracy score among WCG

(4) Emotional Intelligence (MSCEIT) index score among MMBSR > MSCEIT index score among SRSG > MSCEIT index score among WCG

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Chapter 4: Results

The following chapter is a review of the results from several analyses conducted to address the hypotheses made in the previous chapter. First, descriptive statistics of all key study measures are presented for the overall sample, each intervention group, and across key demographic variables (e.g., age, race, and ethnicity), with accompanying tables that provide means, standard deviations, skewness, kurtosis, and tests of normality statistics. Inferential statistics addressing hypothesized outcomes are then described. The principle analyses used in this study were analyses of variance (ANOVA) and Pearson product moment correlation. An alpha level of .05 was used to determine statistical significance for all analyses.

Descriptive Statistics

For the current study, dependent measures of interest were the Mindfulness Attention Awareness Scale (MAAS), the Yoni Test of cognitive and affective Theory of Mind (Yoni), the Maslach Burnout Inventory – Student Survey (MBI-SS), and the Mayer-Salovey-Carusuo Emotional Intelligence Test (MSCEIT). Means, standard deviations, skewness, and kurtosis descriptive statistics across all measures for the overall sample and for each intervention group can be found in Table 3. Normality tests for the 3 levels of the independent variable (intervention type) were performed using visual inspection methods and the Shapiro-Wilk statistical test (see Tables 4 & 5 for summary statistics and normality statistical test for all levels of the independent variable, respectively). Visual inspection methods refer to examining all data graphically for extreme outlier values and using rule-of-thumb cutoffs for skewness and kurtosis (±1 and ±3 statistics, respectively). The Shapiro-Wilk statistical test is based on the correlation between the data and the corresponding normal scores and shows good power to detect whether a

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small sample (recommended n<50) comes from a non-normal distribution (Ghasemi & Zahediasl, 2012).

The mindfulness (MAAS), student burnout (MBI-SS), and emotional intelligence (MSCEIT) measures were found to be adequately normally distributed across the overall sample and across each intervention group. Initial analyses revealed small positive skewness among the data on the cynicism (CY) subscale of the student burnout measure; however this skewness was ameliorated by removing one extreme outlier from the control group (BIG). All cynicism data thus reflects the removal of this outlier case. Further exploration revealed no discernible pattern of cases with extreme outlier values, and all scores appeared within an expected range of responses based on literature published on each measure. Taken together, it is likely that these data are sufficiently symmetrical in its distribution for parametric statistical testing.

However, non-normality was frequently found among the theory of mind data (YONI – proportion correct) using both visual inspection and statistical testing methods, particularly among the condition 'physical' (Table 5). Arcsine transformations applied to the Yoni data did not produce a normal distribution. Therefore, nonparametric inferential statistical tests were used for this data.

Preliminary analyses

Data from one participant in the waitlist control group was missing from all measures except the MSCEIT (collected from an external website). This was due to a technical error. As such, all data from this participant was excluded from data analysis. There were sporadic missing data points in the demographic section, but no missing data for any outcome measures. The demographic missing data included: 3 missing data points for GPA (7.5 %), 2 missing data points for individual income (5 %), and 2 missing data points for combined family income (5%).

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There is no discernible pattern to these missing data points. Data collected from these participants were kept, but not included in respective demographic analyses.

Even though random assignment was used to ensure equality across groups, preliminary analyses were conducted to reveal any striking demographic differences across groups (Table 6). There was no significant difference in participants' age, GPA, race, ethnicity, immigration status, preferred language, parental education level, family income, personal income, or religion across intervention group (all p-values >.05). There was a significant difference in gender distribution found across groups, X^2 (2, N = 40) = 6.77, p=.034. Women accounted for 77.5% (n=31) of the overall sample. Within the general stress reduction group (SRSG), there was an equal distribution of male and female participants (50% female, n=5), while the mindfulness group (MBSR, 93.8% female, n=15) and control group (BIG; 78.6% female, n=11) were less evenly distributed. Thus, gender was examined as a covariate on inferential analyses, but no alternate significance or effect size findings were revealed.

Inferential Results

The main purpose of this study was to investigate whether participants who completed a modified-mindfulness based stress reduction (MMBSR) course reported greater mindfulness, showed greater affective theory of mind abilities, reported less student burnout, and scored higher on an emotion intelligence test than participants who completed a general stress reduction course (SRSG) and waitlist control participants.

Hypothesis 1: Mindfulness. Analysis of variance (ANOVA) showed that on average participants in the modified-MBSR course did not report significantly higher levels of mindfulness (M=50.7, SD=12.0) than participants in the general stress reduction course (M=45.3, SD=6.24) or participants in the control group (M=45.7, SD=7.11) at the end of the

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intervention phase, F(2, 40) = 1.49, p>.05. Notably, the effect size was moderate for the mindfulness measure (MAAS), η^2=.075.

Hypothesis 2: Student burnout. Means and standard deviations for all student burnout measures are presented in the Table 7.

Exhaustion. Analysis of variance revealed a significant difference in reported levels of exhaustion across the three study groups, F (2, 40) = 3.36, p<.05. The effect size was large for the exhaustion measure, η^2=.154. LSD post hoc analyses revealed that participants in the modified-MBSR group reported significantly lower levels of exhaustion (M=18.2, SD=3.97) on average than participants in the control group (M=22.0, SD=3.53), (Mean Difference = -3.81, SE=1.48, p<.05). There was no significant difference in exhaustion levels among the modified-MBSR group participants and the general stress reduction group participants (M=20.3, SD=4.76), (Mean Difference = -2.11, SE=1.62, p>.05). There was also no significant difference in exhaustion levels among the general stress reduction group participants and the control group participants (Mean Difference = -1.70, SE=1.67, p>.05).

Cynicism. Analysis of variance revealed no significant differences in reported levels of cynicism across the three study groups, F (2, 40) = .256, p>.05. The effect size was small for the cynicism measure, η^2=.014.

Personal Efficacy. No significant differences were revealed for reported levels of personal efficacy across the three study groups, F (2, 40) = 2.375, p>.05. However, the effect size was medium-large for the cynicism measure, η^2=.114 and the p-value was marginally significant.

Hypothesis 3: Theory of mind. Kruskal-Wallis H nonparametric statistical tests were used for all Theory of Mind/Yoni task data due to the general non-normal distribution of the

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data. Table 8 lists the means, standard deviations, and mean ranks for all data by intervention group, as well as test statistics comparing each group.

Analyses comparing group differences within first and second order conditions revealed one significant result and one difference trending toward significance. Participants showed significant differences in performance in the 'affective' first order condition depending on intervention group (χ^2 (2) = 9.79, p=.007) (Figure 8). Participants also showed differences in performance in the 'cognitive' first order condition depending on intervention group, however these differences were marginally significant (χ^2 (2) = 5.11, p=.078). No significant or trending group differences were found within any other Yoni conditions: second order 'cognitive' (χ^2 (2) = .815, p>.05), second order 'affective' (χ^2 (2) = 2.38, p>.05), first order 'physical' (χ^2 (2) = .311, p>.05), and second order 'physical (χ^2 (2) = 1.48, p>.05.

Dunnet's t-tests were conducted to make multiple comparisons between the mindfulness intervention group (MMBSR), general stress reduction group (SRSG), and the control group (BIG) across the first order 'affective' condition (Table 9). The MMBSR group participants were more accurate (i.e. proportion correct) in determining Yoni's thoughts and emotions in the first order 'affective' condition than participants in BIG control group, (MD=.054, SE=.027, p<.05). The SRSG group participants were also more accurate in determining Yoni's thoughts and emotions in the first order 'affective' condition than participants in the BIG control group, (MD=.087, SE=.030, p=.05). The MMBSR and SRSG group participants were roughly equal in their accuracy during the first order 'affective' condition (MD=.033, SE=.030, p=.223).

Hypothesis 4: Emotional intelligence. Generally, results did not support any significant effect of intervention group on emotional intelligence, as measured by the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT). Table 10 reports means and standard

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deviations for all relevant MSCEIT subscales. There was no significant difference in overall emotional intelligence across the intervention groups, $F(2, 37) = .745$, $p>.05$. Multivariate ANOVA revealed no significant differences in the four MSCEIT Branch scores, which are the subscales used to calculate the overall MSCEIT score (Perceiving Emotions, Using Emotions, Understanding Emotions, and Managing Emotions), $F(8, 68) = .922$, $p>.05$ Wilk's $\Lambda = .814$, partial $\eta^2 = .098$. The positive-negative bias score provides an indication of an individual's tendency to respond negatively or positively to pictorial stimuli. There was no significant difference finding in this positivity or negativity bias across intervention groups, $F(2, 37) = .710$, $p>.05$.

Exploratory Analyses

Considering the 20% attrition rate of participants prior to the intervention phase, the initial power of the present study was considerably reduced. The researcher considered whether a two-way comparison of intervention group and control groups might reveal any significant differences along outcome measures that the initially hypothesized three-way comparison ultimately revealed. Furthermore, correlational analyses of mindfulness self-report to outcome measures were revealed to be common in extant literature on MBSR, such that additional analyses of the relationship between these variables were deemed relevant to the overarching aims of the present study.

Thus, exploratory analyses were performed to examine whether any significant group differences on select study measures were evident when the active control group (general stress reduction - SRSG) and inactive control group (BIG) were combined and compared to the mindfulness intervention group (MMBSR). Analyses were also performed to explore whether reported mindfulness (regardless of intervention group) was significantly correlated to other

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study measures. Due to the exploratory nature of the following analyses, only relevant statistical analyses are reported.

Mindfulness. Even when the participants in the modified-MBSR course were compared to all other participants (SRSG and BIG, combined), no significant difference in mindfulness was found, $t(21.1) = 1.57$, $p>.05$. The degrees of freedom reported in the previous statistic were adjusted to account for the significant difference in variances between groups (Levene's Test for Equality of Variances, $F=6.43$, $p<.05$).

Student burnout. T-test analysis showed a significant difference between reported exhaustion among modified-MBSR participants ($M=18.2$, $SD=3.97$) and the combined control group participants ($M=21.29$, $SD=4.08$), $t(38) = -2.38$, $p<.05$. Results also showed a significant difference between reported personal efficacy among modified-MBSR participants ($M=28.3$, $SD=3.13$) and the combined control group participants ($M=24.8$, $SD=5.80$), $t(36.8) = 2.47$, $p<.05$. When all three groups during initial hypothesis testing, personal efficacy was found to be marginally significant. The significance finding here suggests that the prior finding may have been due to lack of power. As before, no significant difference was found on the cynicism measure between the mindfulness intervention group ($M=11.4$, $SD=5.89$ MMBSR) and control groups ($M=12.4$, $SD=6.61$), $t(38) = -.509$, $p>.05$.

Relationship between mindfulness and student burnout. Pearson correlation analysis revealed a significant inverse relationship between mindfulness and exhaustion among all study participants, $r= -.427$, $p=.006$. There was also a significant inverse relationship between mindfulness and cynicism, $r= -.316$, $p=.047$. No significant relationship was evident between mindfulness and personal efficacy, $r=.135$, $p>.05$.

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Relationship between mindfulness and affective Theory of Mind. As reported above, significant group differences were found across the first order affective condition on the Yoni task, wherein both mindfulness group (MMBSR) participants and general stress reduction group (SRSG) participants showed greater first order affective theory of mind ability than control (BIG) participants. However, exploratory analyses revealed that these group differences collapsed when the mindfulness group participants (Mean Rank = 22.53) were compared to the combined control group (SRSG and BIG; Mean Rank = 19.15), χ^2 (2) = 1.08, p>.05. Group differences across all other Yoni task conditions remained not significant when the MMBSR group was compared to the combined SRSG and BIG group. Furthermore, no significant correlation was evident between mindfulness and first order affective Theory of Mind, r=.049, p>.05.

Relationship between mindfulness and overall emotional intelligence. There was no significant relationship between mindfulness and overall emotional intelligence evident among the sample, r=.055, p>.05.

Results Summary

Participants enrolled in the modified mindfulness-based stress reduction (modified-MBSR) intervention reported higher of mindfulness on average than participants in the general stress reduction course and participants in the waitlist control group, although the differences were not found to be statistically significant. The present study therefore does not support that the modified-MBSR intervention caused significantly higher levels of mindfulness among participants compared to a general stress reduction course or no intervention at all.

This study does, however, contribute further evidence to support mindfulness' impact on student burnout. Students enrolled in the mindfulness intervention reported significantly less

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exhaustion related to their schoolwork as opposed to students in the control groups. When the control groups were combined and compared to the mindfulness intervention, significant group differences in exhaustion as well as personal efficacy were found. Additionally, regardless of group assignment, a significant correlation between mindfulness and student burnout emerged. Of the three dimensions of student burnout investigated in this study, cynicism was not found to be impacted by the mindfulness intervention nor significantly related to mindfulness behaviors. Overall, participants with higher levels of self-reported mindfulness behaviors reported lower levels of emotional exhaustion and higher levels of personal efficacy.

Taken together, mindfulness appears to be related to students' sense of exhaustion and feelings of pride in their work. Yet, it is not clear that the modified-MBSR intervention of this study significantly influenced those levels of mindfulness.

No clear evidence that mindfulness uniquely impacts theory of mind emerged. However, stress reduction interventions, delivered either from the modified-MBSR or general course, may have impacted aspects of theory of mind among participants. Namely, participants in both stress reduction groups were significantly better at making accurate, automatic, emotion-related decisions about an "other" (affective theory of mind) than the control group. These group differences disappeared for higher-order emotion-related theory of mind. No group differences were evident for primarily cognitive, non-emotion-related theory of mind.

No significant group differences emerged in overall emotional intelligence, nor among specific branches of emotional intelligence, such as perceiving emotion. Emotional intelligence is a stable, trait-like psychological construct that may not be sensitive to time-limited interventions.

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Chapter 5: Discussion

The goal of the present study was to assess the effect of a modified mindfulness-based stress reduction (MBSR) program on student burnout and social cognition (as measured by theory of mind and emotional intelligence) among premedical and medical students. It was hypothesized that participants in the modified-MBSR program would report higher levels of mindfulness, lower levels of student burnout, higher levels of affective Theory of Mind, and higher levels of emotional intelligence than participants in a general stress reduction program (active control group) and participants on a waitlist for intervention (inactive control group). Overall, the results suggest that the mindfulness program had the most significant effect on student burnout. In contrast, the mindfulness program did not produce significantly higher levels of mindfulness or emotional intelligence among its participants when compared to the active and inactive control groups. Both the mindfulness program and stress reduction program influenced first-order affective theory of mind among its participants compared to the waitlist control participants, but neither intervention influenced second-order affective theory of mind. This chapter will further discuss the implications of these findings, study limitations, and suggestions for future research.

Discussion of Results

The modified-MBSR program delivered in this study was expected to produce significantly higher levels of mindfulness among its participants when compared to participants who did not receive a mindfulness intervention. While no differences in self-reported mindfulness were found across groups, the present study did find that participants in the MBSR program reported significantly lower levels of exhaustion than participants on the waitlist

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(inactive control). When the active and inactive control groups were combined and compared to the intervention group, results revealed a similar group difference in exhaustion as well as an additional group difference in personal efficacy. Thus, MBSR participants on average reported greater feelings of effectiveness in their student work than participants in the combined control groups. These finding contribute to the robust literature investigating whether MBSR programs help participants effectively manage stress. The findings of this study support the assertion that MBSR interventions leave participants feeling less exhausted and "burnt out" than peers who do not receive these interventions.

Yet, the results of the present study are puzzling in that participants in the MBSR condition reported feeling less stressed but did not significantly report feeling more mindful. Brown and Ryan (2003) discussed that while past research has provided compelling evidence that training in mindfulness facilitates *well-being* using a variety of outcome measures among clinical and nonclinical populations, mindfulness research had not yet determined whether it is mindfulness itself that enhances psychological well-being. For instance, Brown and Ryan (2003) conducted a clinical intervention study (8-week standardized MBSR program) and their results showed as association between increased levels of mindfulness and decreased levels of mood disturbance and stress pre- to post-intervention. However, they did not include a randomized control group, so the question of the differential effect of mindfulness training could not be answered. Furthermore, mindfulness levels did not change significantly over the 8 weeks of their study.

Goldberg, Greene, Tucker, and Simpson (2018) conducted a rigorous meta-analysis of 69 published randomized, controlled studies representing 55 independent clinical samples (n=4,743) involving mindfulness-based interventions. Results showed that patients' reported changes in

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clinical outcomes (e.g., depression) were more robust than reported changes in mindfulness across all conditions. Thus, mindfulness interventions (and non-mindfulness, therapeutic interventions) appear to be better at improving subjective well-being than improving self-reported mindfulness. While a strong consensus among meditation researchers continues to assert a model wherein mindfulness mediates the relationship between MBIs and clinical outcomes, emergent meta-analyses such as Goldberg et al. (2018) reflect the possibility of additional, non-mindfulness-based pathways by which MBIs reduce clinical symptoms (e.g., reduced stress).

No significant group differences were found on the cynicism dimension – neither when all three groups were compared nor when the combined control groups were compared to the intervention group. The Maslach Burnout Inventory (MBI), the primary measure of burnout used in the literature and the present study, contains a three-factor structure in which exhaustion, cynicism, and personal efficacy are considered independent components of the burnout syndrome. Thus, the lack of a significant difference finding on the cynicism dimension alone does not undermine the significant differences evident along the exhaustion and personal efficacy dimensions.

A selective review of the literature was performed to identify MBSR studies that used burnout as an outcome measure in order to glean more information about the independent components of burnout. Relevant studies were found in which exhaustion and self-efficacy were significantly different in group comparisons, but cynicism was either not found to be significantly different in group comparisons, erroneously combined with the other dimensions of burnout into a total burnout score, or not found to be correlated with mindfulness (Cohen-Katz, Wiley, Capuano, Baker, & Shapiro, 2005; Shapiro, Astin, Bishop, & Cardova, 2005; Goodman

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& Shoorling, 2012). Thus, a tentative argument about the reliability and validity of the cynicism dimension of the MBI in mindfulness studies may be appropriate in light of the present study's null finding along this dimension and similar findings in the literature. Furthermore, critiques of the validity of the burnout measure and its overlap with clinical diagnostic criteria for depression and anxiety (Schonfeld & Bianchi, 2016; Liu & Van Liew, 2003) are warranted. The cynicism dimension of burnout may not overlay depression and anxiety criteria as well as the exhaustion and personal efficacy dimension of burnout. Future research on burnout must also consider the discriminant validity of depressive and anxiety symptoms to investigate this controversy further.

Affective Theory of mind. Results from the present study demonstrated that the stress reduction interventions delivered in the present study, both mindfulness-based (MBSR) and non-mindfulness based (active control group), resulted in greater accuracy in first-order emotional perspective taking abilities than no such intervention (waitlist control). However, no significant group differences were found in second-order emotional perspective taking abilities. First-order emotional perspective taking abilities (i.e., first-order affective Theory of Mind) can be described as the ability to make the construction "I think that he/she feels…" while second-order emotional perspective taking abilities allows one to make the construction, "I think that you think that he/she feels...". Two possible conclusions were identified from these findings: (1) that reduced stress, rather than greater mindfulness, may impact affective Theory of Mind abilities and (2) that stress reduction interventions may enhance specific aspects of cognition that differentially contribute to first-order versus second-order Theory of Mind processes.

The present study hypothesized that a mindfulness-based intervention would cause participants' to display greater affective theory of mind than participants in a general stress reduction course and control participants. This hypothesis was made on the strength of

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theoretical suppositions about the type of reflective capacity practiced during mindfulness meditation and its relationship to the development and strengthening of social cognitive abilities including Theory of Mind (i.e., fundamental definitions and conceptualizations of mindfulness - Bishop et al., 2004; theoretical mechanisms of change in dialectical behavioral therapy - Lynch, Chapman, Rosenthal, Kuo, & Linehan, 2006; perspectives from developmental social cognitive neuroscience - Zelazo & Lyons, 2012).

Yet, the roughly equivalent level of accuracy in affective Theory of mind among participants in the mindfulness and general stress reduction groups suggest that interventions aimed at reducing stress, rather than increasing mindfulness, may be most effective in improving emotional perspective taking.

The present study findings engendered further consideration of an emerging literature on the effects of stress on human social behavior broadly. In rodents, acute and chronic stress is related to reduced social behaviors measured in a variety of ways including aggression, reduced social motivation, social avoidance, and social fear (Sandi & Haller, 2015). While these findings emphasize asocial and antisocial behavior patterns, questions remain about how stress influences the interaction between social behavior and empathy. Examples from studies in humans indicate that stress, rather than prompting a fight-or-flight response, may actually enhance prosocial behaviors ("tend-and-befriend hypothesis", von Dawans, Fischbacher, Kirschbaum, Fehr, & Heinrichs, 2012). Findings from Tomova, von Dawans, Heinrichs, Silani, and Lamm (2013) suggest gender differences in the effects of stress on self-other distinction, whereby men respond to stress with increased egocentricity and less adaptive emotion regulation while women increasingly disambiguate self and other during stress, which enables more

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accurate social responses. While a consistent theory has not yet emerged, continued attention to the role of stress in human's abilities to be in tune with others is warranted.

The differential result between first-order and second-order affective Theory of Mind may be explained by the consideration that mindfulness and stress reduction training may enhance specific aspects of cognition that differentially contribute to lower and higher orders of Theory of Mind. Jha, Krompinger, and Baime (2007) examined the role of mindfulness training on three neuroanatomically and functionally distinct but overlapping attentional systems: alerting (becoming aware of a stimulus, such as a dog barking behind a locked gate, and maintaining an alert state of preparedness), orienting (directing and limiting attention to a subset of possible inputs, such as focusing on your friend's conversation rather than the dog barking), and conflict monitoring (prioritizing among competing tasks and responses, such as an effortful choice to maintain focus on your friend despite your fear of dogs and desire to flee). The authors found that participation in an MBSR course and retreat improved receptive attentional skills and the ability to orient attention, but did not impact conflict monitoring performance. Thus, MBSR and other stress reduction interventions may enhance specific subcomponents of affective Theory of Mind related to lower-order processing but be less effective at influencing the subcomponents of Theory of Mind related to higher-order processing. Moreover, this process may be mediated by the role of stress in emotion regulation, a bottom-up process, rather than top-down cognitive processes.

Another possible explanation for this finding is that there is a relationship between stress and the ability to make accurate predictions of others' thoughts and feelings when the level of difficulty in these predictions is low. When it appears that others' thoughts and feelings are obvious, we may be more prone to prediction error. When more consideration of context clues is

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needed for accuracy, we may rely on our cognitive abilities more effortfully and be less dependent on emotion-regulated processes in order to increase accuracy likelihood.

Emotional intelligence. Results of the present study did not support any significant effect of MBSR participation on emotional intelligence when compared to the active and inactive control groups. The present study hypothesized a causal relationship between mindfulness and emotional intelligence due to theorizing that identify both constructs within a social cognition framework (Bishop et al., 2004; Salovey & Mayer, 1990). Recent research perspectives have demonstrated the mediating role of emotional intelligence on the relationship between mindfulness and well-being, rather than any causal relationship between mindfulness and emotional intelligence as hypothesized in the present study (Wang & Kong, 2013; Bao et al., 2015).

Limitations and critiques of present study

Sample size. The intended recruitment goal of the present study was 75 participants. Sixty-one participants were recruited, 20 participants dropped out of the study after the recruitment phase/before the intervention phase, and data from one participant was missing due to technical error during the measurement phase. Thus, 40 participants were included in the final data analyses for the present study, which was likely an insufficient sample size to test all study measures - especially those with small effect sizes (e.g., the cynicism dimension of student burnout). It is likely that due to the small sample size there was insufficient power to detect a differential effect of intervention across all outcome measures. Any future study should raise the recruitment goal to 100 participants in anticipation of the relatively high attrition rate in mindfulness research (mean 29%; Nam & Toneatto, 2016). Furthermore, as the exit survey results from the 20 participants who dropped out of the study after the recruitment phase

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revealed, more care may be needed to offer additional day/times for the intervention course in order to avoid scheduling conflicts and retain interested participants. Nam & Toneatto (2016) found that scheduling, dissatisfaction with intervention group allocation (preference for mindfulness intervention over waitlist control), and lack of continued interest were the most common reasons cited for attrition among participants in randomized mindfulness intervention studies.

Baseline measures. A significant limitation of the present study is the lack of pre-intervention measures, so that no comparisons of *change* in mindfulness, student burnout, affective Theory of Mind, and emotional intelligence across groups could be made. This is important for several reasons. To illustrate the potential benefits of baseline measures, I will use mindfulness as an example, although all outcome variables were appropriate for pretesting.

First, while random assignment was used to protect against variations of baseline mindfulness among participants, pretest measures provide an additional level of confidence that participants did not systematically differ in baseline mindfulness. Randomization is more likely to fail when the sample size is small. Pretesting in addition to random assignment increases confidence that any changes in mindfulness post-intervention were indeed due to the mindfulness intervention when compared to a control group. Second, it is important to determine whether, among the overall sample, participants' baseline levels of mindfulness were skewed in either direction compared to the population. For instance, participants from this sample may have reported particularly high levels of mindfulness to start, making it difficult to detect any significant group differences at a later time. Lastly, comparisons of change in mindfulness pre- and post-intervention phase may have been more powerful than comparisons of post-intervention levels of mindfulness alone. As a result, statistical analyses would have a greater probability of

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detecting a significant difference between groups when using the pre-post change measure rather than a post-intervention measure only.

Baseline measures would certainly be included in any subsequent study of these phenomena. Follow-up study necessitates pretest and posttest measures in order to better control for between-groups variation in baseline levels of outcome variables, better understand the overall sample's baseline levels of outcome variables compared to the general population, and to increase the power to detect group differences across outcome variables as a result of intervention. Furthermore, end of semester follow-up of participants (e.g., 4 weeks post intervention) would further strengthen the present study and reveal any potential extinction of or latent expression of intervention effects.

Alternative emotional intelligence measure. The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) may not have been the best measure of overall emotional intelligence for the purposes of this study due to its administration length (30-45 minutes); a short form does not exist for the MSCEIT. Observations made by study personnel during the measurement phase of the present study noted fatigue among participants (i.e., verbal remarks made by participants, exceedingly fast response times), and this fatigue effect is thought to have affected all participants scores. The MSCEIT was chosen for its well-established psychometric properties, comprehensive assessment of emotional intelligence equivalent to measurement of intelligence (g) quotient, and relevance to workplace performance and organizational psychology research (Brackett & Mayer, 2003; Rosete & Ciarrochi, 2005). However, few mindfulness studies have utilized the MSCEIT, opting instead for scales created by research teams specifically for their research use (e.g., Wong Law Emotional Intelligence Scale (WLEIS), Wong & Law, 2002; The Assessing Emotions Scale, Schutte & Malouff, 2011).

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A future study might include a short-form emotional intelligence questionnaire, like the Trait Emotional Intelligence Questionnaire – Short Form (TEIQue-SF; Cooper & Petrides, 2009), as a pretest-posttest measure of emotional intelligence change over the course of the intervention phase. The TIEQue-SF is a 30-item form that provides a comprehensive assessment of an individual's emotional self-perceptions based on emotional intelligence trait theory. These perceptions are theorized to be located at the basic levels of personality hierarchies, such that they may be influenced by habitual, state-dependent processes. The TIEQue-SF takes 5 minutes to administer, making it a desirable choice for research designs with limited experimental time. The TIEQue-SF has also been used in recent mindfulness studies of nurses and midwives (Snowden et al., 2015), undergraduate students majoring in education (Gendron, Kouremenou, & Rusu, 2016), and occupational therapists (Jacobs, Wollny, Sim, & Horsch, 2016).

Modified-Mindfulness Based Stress Reduction. It is important to consider that the modifications made to the modified-MBSR intervention in the present study may not have delivered a high enough treatment dose to produce a statistically significant difference in mindfulness levels across groups. The traditional MBSR course consists of 26 hours of session time including eight classes of 2½ hours and one all-day class ('retreat"). The present study consisted of about half the traditional time (i.e. 12 hours of session time including eight classes lasting one hour each and one half-day retreat). In the present study, the effect size of the modified-MBSR intervention on mindfulness was moderate. The MBSR group participants reported the highest levels of mindfulness on average compared to active and inactive control group participants. Nevertheless, the lack of significance of this finding may have been due in part due to the decreased dose of MBSR delivered in the intervention condition.

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Carmody and Baer (2009) considered how long a MBSR program needs to be in order to be effective by examining the effect sizes for psychological distress variables in published studies of MBSR using abbreviated and traditional formats. The authors found that the correlation between effect size and number of in-class hours was not significant for both clinical and nonclinical samples – a promising preliminary finding to support the continued use of modified-MBSR programs. Modifications to MBSR are commonplace and potentially worthwhile for populations with time commitment barriers to participation, such as healthcare professionals. However, it is traditional MBSR formats that have received the most empirical support for MBSR efficacy across a variety of outcome variables. Modifications to MBSR contact hours have not yet been systematically examined in order to reveal the threshold for MBSR contact hours and efficacy. Moreover, while lower session times may not affect deficit measures such as psychological distress and professional burnout, only traditional MBSR interventions, with longer session times, have been shown to empirically improve mindfulness itself.

A future study would seek to implement a traditional MBSR format (e.g., 26 hours of session time) or an increased dosage (e.g., 20 hours of session time, up from 12 hours in the present study). Ultimately, future research will aim to utilize an MBSR treatment format that is powerful enough to impact both negative (i.e. student burnout) and positive (i.e., mindfulness, theory of mind, emotional intelligence) outcome measures.

Active control group – General Stress Reduction. To-date, few empirical investigations of mindfulness interventions have compared MBSR to an active control intervention or both an active control and inactive control group[2]. In the present study design,

[2] Khoury, Sharma, Rush, & Fournier (2015) conducted the most recent meta-analysis of MBSR interventions among healthy individuals. Only one study (out of 29) included in the meta-analysis compared MBSR to an active

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modified-MBSR was compared to a general stress reduction course (active control) and waitlist (inactive) control group. By including an active control group to the between-groups design, the present study maintained a higher standard of comparison across groups than most of the published literature on MBSR. Considering the limitations to this study addressed above, particularly sample size and potency of the modified-MBSR intervention, the inclusion of the active control group likely impacted the power of the present study. While rigorous in conception, the active control group was beyond the standard of a pilot study and future research would seek to first establish an effect between intervention and waitlist control before introducing an additional active control condition.

Future Directions

The present study supported the published literature on the efficacy of mindfulness based stress reduction (MBSR) programs on self-reported stress among trainees in the healthcare profession. The present investigation also revealed the common conceptual and methodological limitations to mindfulness research. Most of the published empirical studies on MBSR employ small sample size, do not include of an additional treatment comparison group in order to control for factors such as the benefits of general (non-mindfulness based) stress reduction techniques, make modifications to standard MBSR to accommodate time-stressed populations, and lack long-term follow-up of participants.

Systematic investigations into the efficacy of modified-MBSR programs is an important future direction for MBSR research, particularly among time-stressed individuals like healthcare

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treatment. Any study examining MBSR interventions among healthy adults (i.e., over 18) was eligible for inclusion in the meta-analysis. Studies were excluded if they (1) did not evaluate the intervention or implemented a qualitative design; (2) did not sample healthy participants; (3) did not include stress and/or anxiety measures; (4) utilized other stress reduction strategies; or (5) did not include sufficient data to compute the effect size.

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professionals. Researchers have reported that MBSR studies among healthcare professionals tend to have higher attrition rates than other populations (both clinical and nonclinical). Investigations into what aspects of MBSR are most difficult to adhere to (e.g., class time, homework) may improve participant experience and encourage continued practice. Investigations into "dose" threshold of MBSR programs (e.g., hours of in-class practice) could help researchers create programs that accommodate scheduling concerns and maintain the active mindfulness change ingredient of MBSR programs.

Beyond the methodological issues confronting MBSR, there are lingering conceptual questions about mindfulness as a psychological construct and a lack of empirical studies about the role of mindfulness in stress reduction and broader social cognitive functions like theory of mind and emotional intelligence. For instance, mindfulness meditation is a major component of Dialectical Behavioral Therapy (DBT) – the leading clinical intervention for borderline personality disorder (BPD). Within the DBT framework, mindfulness, alongside other core skills such as emotion regulation and interpersonal effectiveness, is used as a tool for integrating the dialectic between acceptance and change – a complex cognitive task that necessitates an integration of emotion and cognition (Lynch et al., 2006). Take another instance, within a nonclinical framework, wherein developmental social cognitive neuroscience has postulated that age-appropriate mindfulness training in early childhood may support the self-regulation skills necessary for social emotional competence[3]. The mechanism of action for mindfulness has been theorized to work by strengthening top-down cognitive (e.g., attention, planning) and regulating bottom-up affective (e.g., stress, self-concept) processes, producing within the child the reflective stance necessary for problem-solving and play (Zelazo & Lyons, 2012). While

[3] Social emotional competence in childhood is linked to trait-like emotional intelligence in later adolescence and adulthood.

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heavily theorized and now widely used within Western society at all levels of organization (e.g., schools, prisons, hospitals), the role of mindfulness in a systems level view of cognition and social cognition specifically has not been well demonstrated empirically.

Given the demonstrated benefits of MBSR and the proliferation of courses available to all populations, mindfulness maintains a powerful role in modern society as a proposed antidote to the increasingly unreflective, automatic, and divisive social world that Western society currently faces. Thus, it is important that scientific investigations of mindfulness continue to strive for methodological rigor and researchers aim to produce sound empirical evidence for its use. Moreover, mindfulness researchers should continue to situate mindfulness in a broader context of social cognitive and psychological processes in order to expand our understanding of the human brain and mind – science's final frontier. Fervent interdisciplinary interest and ever-expanding use in applied settings leaves mindfulness poised as a promising roadmap to such discoveries in the 21st century.

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Tables

Table 1. Intervention*Attrition from Recruitment Phase

	Attrition, n (%)	Retention, n (%)
Mindfulness Stress Reduction	5 (23.8)	16 (76.2)
General Stress Reduction	10 (50.0)	10 (50.0)
Waitlist	5 (25.0)	15 (75.0)
Column Totals	20 (32.7)	41 (67.2)

Chi-square statistic = 4.01, p=.135

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Table 2. Demographic summary

	Overall Sample (*N* = 40)
Demographics	
Female, *n* (%)	31 (77.5)
Age (years), mean (SD)	19.4 (1.64)
GPA, mean (SD)	3.64 (.369)
Race, *n* (%)	
Asian/Pacific-Islander	22 (55.0)
Black/African-American	11 (27.5)
White/Caucasian	4 (10.0)
American Indian/Alaskan Native	3 (7.5)
Ethnicity, *n* (%)	
Hispanic	6 (15.0)
Not Hispanic	34 (85.0)
Immigration Status, *n* (%)	
U.S. Born	29 (72.5)
Non-U.S. Born	10 (27.5)
Preferred Language[4], *n* (%)	
English	36 (90.0)
Other	10 (27.5)
Maternal Education Level, *n* (%)	
Attended high school, but not completed	8 (20.0)
High school degree or equivalent (e.g., GED)	7 (17.5)
Associate's degree	6 (15.0)
4-year college attended, but not completed	2 (5.00)
Bachelor's degree	13 (32.5)
Graduate degree (M.D., Ph.D., J.D., etc.)	4 (10.0)
Paternal Education Level, n (%)	
Attended high school, but not completed	7 (17.5)
High school degree or equivalent (e.g.,	6 (15.0)

[4] Participants indicated primary and other languages spoken. Outside of English, primary languages reported include Arabic, French, Bengali, Urdu, and Uzbek. Secondary and tertiary languages reported include Chinese (Cantonese and/or Mandarin), Spanish, Bengali, & Hindi.

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GED)	
Associate's degree	---
4-year college attended, but not completed	3 (7.50)
Bachelor's degree	17 (42.5)
Graduate degree (M.D., Ph.D., J.D., etc.)	7 (17.5)
Family Income (per year), *n* (%)	
Less than $35,000	11 (27.5)
$35,000 - 69,999	9 (22.5)
$70,000 – 99,999	7(17.5)
Above $100,000	11 (27.5)
Individual Income (per year), n (%)	
Less than $2,000	31 (77.5)
Above $2,000	7 (17.5)
Religious Affiliation, *n* (%)	
Christian	19 (47.5)
Muslim	8 (20.0)
Buddhist	4 (10.0)
Hindu	3 (7.50)
Other	3 (7.50)
Atheist	2 (5.00)
Jewish	1 (2.5)

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Table 3. Summary statistics for overall sample (n=40).

Variable	Range	Mean	SD	Skewness	Kurtosis
Mindfulness (MAAS)	29.0-67.0	47.6	9.36	.331	.012
Student Burnout (MBI-SS)					
Exhaustion	11.0-28.0	19.7	4.39	.194	-.803
Cynicism	3.00-30.0	12.0	6.28	1.05	.784
Personal Efficacy	15.0-34.0	26.2	5.16	-.467	-.848
Theory of Mind (YONI)*					
First order Theory of Mind					
Cognitive (Cog1) - Proportion Correct	.330-1.00	.906	.130	-2.58	9.09
Affective (Aff1) - Proportion Correct	.290-1.00	.810	.175	-1.44	1.85
Control (Phy1) - Proportion Correct	.750-1.00	.948	.079	-1.40	.889
Second order Theory of Mind					
Cognitive ToM (Cog2) – Proportion Correct	.560-1.00	.834	.140	-.066	-1.05
Affective ToM (Aff2) - Proportion Correct	.380-1.00	.906	.144	-1.91	3.92
Control condition (Phy2) – Proportion Correct	.170-1.00	.871	.231	-2.01	3.30
Emotional Intelligence (MSCEIT)					
Perceiving Emotions Branch Score	73.3-134	97.3	14.9	.650	.593
Using Emotions Branch Score	60.1-124	91.8	13.7	-.116	.081
Understanding Emotions Branch Score	53.8-112	91.6	13.8	-.655	.087
Managing Emotions Branch Score	68.0-108	91.0	11.2	-.597	-.444
Overall Emotional Intelligence	59.0-112	90.7	13.3	-.546	-.408
Positive-Negative Bias	83.3-134	105	12.9	.652	-.135

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Table 4. Summary Statistics for all levels of the independent variable (intervention type).

Variable	Intervention	N	Range	Mean	SD	Skewness	Kurtosis
Mindfulness (MAAS)	MMBSR	16	31.0-67.0	50.7	12.0	-.059	-1.13
	SRSG	10	35.0-56.0	45.3	6.24	-.357	.303
	BIG	14	29.0-59.0	45.7	7.1	-.515	1.67
Theory of Mind (YONI)							
First order Theory of Mind							
Cognitive (Cog1) - Proportion Correct	MMBSR	16	.67-1.00	.917	.091	-1.39	2.52
	SRSG	10	.83-1.00	.967	.058	-1.66	2.05
	BIG	14	.33-1.00	.851	.180	-2.05	5.01
Affective (Aff1) - Proportion Correct	MMBSR	16	.75-1.00	.958	.081	-1.77	2.01
	SRSG	10	.92-1.00	.992	.026	-3.16	10.0
	BIG	14	.75-1.00	.905	.086	-.669	-.355
Control (Phy1) - Proportion Correct	MMBSR	16	.63-1.00	.914	.135	-1.45	.894
	SRSG	10	.75-1.00	.925	.105	-1.00	-.665
	BIG	14	.38-1.00	.884	.180	-2.13	4.67
Second order Theory of Mind							
Cognitive ToM (Cog2) – Proportion Correct	MMBSR	16	.290-.960	.789	.180	-1.77	2.99
	SRSG	10	.710-1.00	.863	.100	-.038	-1.39
	BIG	14	.330-1.00	.798	.212	-1.06	.273
Affective ToM (Aff2) - Proportion Correct	MMBSR	16	.580-1.00	.792	.149	-.040	-1.76
	SRSG	10	.720-1.00	.892	.083	-.769	.663
	BIG	14	.560-1.00	.841	.153	-.942	-.780
Control condition (Phy2) – Proportion Correct	MMBSR	16	.170-1.00	.823	.288	-1.74	1.91
	SRSG	10	.500-1.00	.933	.161	-2.66	7.19
	BIG	14	.330-1.00	.881	.201	-1.87	3.39
Student Burnout							
Exhaustion (EX)	MMBSR	16	11.0-25.0	18.2	3.97	-.107	-.850
	SRSG	10	14.0-20.8	20.3	4.76	.493	-1.33
	BIG	14	16.0-28.0	22.0	3.53	-.012	-.734
Cynicism (CYN)	MMBSR	16	4.00-24.0	11.4	5.89	.819	-.043
	SRSG	10	5.00-24.0	13.2	5.37	.674	.676
	BIG	14	3.00-30.0	11.9	7.52	1.48	1.81

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	BIG[5]	13	3.00-25.0	10.5	5.64	1.47	2.92
Personal Efficacy (PE)	MMBSR	16	23.0-34.0	28.3	3.13	-.309	-.259
	SRSG	10	19.0-32.0	24.6	4.86	.377	-1.58
	BIG	14	15.0-34.0	24.9	6.56	-.130	-1.58
Emotional Intelligence (MSCEIT)							
Perceiving Emotions Branch Score	MMBSR	16	73.3-134	93.4	14.8	1.27	2.85
	SRSG	10	77.0-131	97.9	14.8	1.06	2.53
	BIG	14	73.4-132	101	15.0	.024	.614
Using Emotions Branch Score	MMBSR	16	68.0-114	91.3	13.1	-.162	-.135
	SRSG	10	71.1-99.3	86.4	10.1	-.317	-1.29
	BIG	14	60.1-124	96.2	15.7	-.630	1.25
Understanding Emotions Branch Score	MMBSR	16	72.0-112	93.9	12.7	-.281	-1.02
	SRSG	10	53.8-108	88.1	16.4	-.855	.890
	BIG	14	62.7-112	91.6	13.7	-.692	-.047
Managing Emotions Branch Score	MMBSR	16	73.7-106	92.9	10.2	-.444	-.669
	SRSG	10	68.0-105	88.4	13.7	-.668	-1.13
	BIG	14	70.6-108	90.7	10.7	-.483	.053
Overall Emotional Intelligence	MMBSR	16	65.0-109	90.6	12.6	-.686	-.187
	SRSG	10	59.0-100	86.9	13.4	-1.17	.759
	BIG	14	71.0-112	93.7	14.3	-.396	-1.227
Positive-Negative Bias	MMBSR	16	83.3-132	105	12.9	.562	-.216
	SRSG	10	88.5-132	108	13.2	.476	-.248
	BIG	14	84.1-134	101	13.0	1.16	1.83

[5] Outlier removed.

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Table 5. Tests of Normality for all levels of the independent variable (intervention type)

Variable	Intervention	Test of Normality
Mindfulness (MAAS)	MMBSR	W(16)=.926, p=.207
	SRSG	W(10)=.894, p=.187
	BIG	W(14)=.955, p=.635
Theory of Mind (YONI)		
First order Theory of Mind		
Cognitive (Cog1) - Proportion Correct	MMBSR	W(16)=.810, p=.004*
	SRSG	W(10)=.650, p=.000*
	BIG	W(14)=.771, p=.002*
Affective (Aff1) - Proportion Correct	MMBSR	W(16)=.589, p=.000*
	SRSG	W(10)=.366, p=.000*
	BIG	W(14)=.854, p=.025*
Control (Phy1) - Proportion Correct	MMBSR	W(16)=.682, p=.000*
	SRSG	W(10)=.717, p=.001*
	BIG	W(14)=.676, p=.000*
Second order Theory of Mind		
Cognitive ToM (Cog2) – Proportion Correct	MMBSR	W(16)=.787, p=.002*
	SRSG	W(10)=.910, p=.283
	BIG	W(14)=.871, p=.044*
Affective ToM (Aff2) - Proportion Correct	MMBSR	W(16)=.881, p=.040*
	SRSG	W(10)=.934, p=.485
	BIG	W(14)=.819, p=.009*
Control condition (Phy2) – Proportion Correct	MMBSR	W(16)=.656, p=.000*
	SRSG	W(10)=.500, p=.000*
	BIG	W(14)=.672, p=.000*
Student Burnout		
Exhaustion (EX)	MMBSR	W(16)=.979, p=.951
	SRSG	W(10)=.886, p=.151
	BIG	W(14)=.976, p=.946
Cynicism (CYN)	MMBSR	W(16)=.921, p=.175
	SRSG	W(10)=.937, p=.519

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	BIG	W(14)=.844, p=.019*
	BIG[6]	W(13)=.883, p=.079
Personal Efficacy (PE)	MMBSR	W(16)=.932, p=.264
	SRSG	W(10)=.893, p=.183
	BIG	W(14)-.918, p=.206
Emotional Intelligence (MSCEIT)		
Perceiving Emotions Branch Score	MMBSR	W(16)=.914, p=.134
	SRSG	W(10)=.912, p=.295
	BIG	W(14)=.971, p=.889
Using Emotions Branch Score	MMBSR	W(16)=.960, p=.655
	SRSG	W(10)=.934, p=.493
	BIG	W(14)=.965, p=.802
Understanding Emotions Branch Score	MMBSR	W(16)=.941, p=.366
	SRSG	W(10)=.938, p=.533
	BIG	W(14)=.946, p=.495
Managing Emotions Branch Score	MMBSR	W(16)=.936, p=.304
	SRSG	W(10)=.864, p=.086
	BIG	W(14)=.936, p=.371
Overall Emotional Intelligence	MMBSR	W(16)=.942, p=.372
	SRSG	W(10)=.886, p=.154
	BIG	W(14)=.913, p=.171
Positive-Negative Bias	MMBSR	W(16)=.946, p=.434
	SRSG	W(10)=.971, p=.904
	BIG	W(14)=.919, p=.216

*. Significant at the 0.05 level.

[6] Outlier removed.

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Table 6. Preliminary analyses for intervention group differences across demographics

	Overall Sample (N = 40)	Mindfulness Stress Reduction (n=16)	General Stress Reduction (n=10)	Waitlist Control (n=14)	Statistical analyses
Demographics					
Female, *n* (%)	31 (77.5)	15 (93.8)	5 (50.0)	11 (78.6)	p=.034*
Age (years), mean (SD)	19.4 (1.64)	19.0 (1.21)	19.6 (1.90)	19.7 (1.90)	p=.460
GPA, mean (SD)	3.64 (.369)	3.69 (.268)	3.67 (.364)	3.57 (.478)	p=.696
Race, *n* (%)					p=.242
Asian/Pacific-Islander	22 (55.0)	11 (68.8)	5 (50.0)	6 (42.9)	
Black/African-American	11 (27.5)	4 (25.0)	1 (10.0)	6 (42.9)	
White/Caucasian	4 (10.0)	1 (6.30)	2 (20.0)	1 (7.10)	
American Indian/Alaskan Native	3 (7.5)	---	2 (20.0)	1 (7.10)	
Ethnicity, *n* (%)					p=.447
Hispanic	6 (15.0)	1 (6.30)	2 (20.0)	3 (21.4)	
Not Hispanic	34 (85.0)	15 (93.8)	8 (80.0)	11 (78.6)	
Immigration Status, *n* (%)					p=.459
U.S. Born	29 (72.5)	11 (68.8)	6 (60.0)	12 (85.7)	
Non-U.S. Born	10 (27.5)	4 (25.0)	4 (40.0)	2 (14.3)	
Preferred Language[7], *n* (%)					p=.186
English	36 (90.0)	15 (93.8)	6 (60.0)	14 (100)	
Other	10 (27.5)	1 (6.3)	4 (40.0)	---	
Maternal Education Level, *n* (%)					p=.690
Attended high school, not completed	8 (20.0)	3 (18.8)	2 (20.0)	3 (21.4)	
High school degree or equivalent	7 (17.5)	4 (25.0)	2 (20.0)	1 (7.10)	
Associate's degree	6 (15.0)	2 (12.5)	2 (20.0)	2 (14.3)	
4-year college attended, not completed	2 (5.00)	---	---	2 (14.3)	
Bachelor's degree	13 (32.5)	6 (37.5)	2 (20.0)	5 (35.7)	
Graduate degree (M.D., Ph.D., J.D., etc.)	4 (10.0)	1 (6.30)	2 (20.0)	1 (7.10)	
Paternal Education Level, n (%)					p=.470
Attended high school, not completed	7 (17.5)	3 (18.8)	3 (30.0)	1 (7.10)	
High school degree or equivalent	6 (15.0)	4 (25.0)	---	2 (14.3)	

[7] Participants indicated primary and other languages spoken. Outside of English, primary languages reported include Arabic, French, Bengali, Urdu, and Uzbek. Secondary and tertiary languages reported include Chinese (Cantonese and/or Mandarin), Spanish, Bengali, & Hindi.

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Associate's degree	---	---	---	---	
4-year college attended, not completed	3 (7.50)	1 (6.30)	---	2 (14.3)	
Bachelor's degree	17 (42.5)	5 (31.3)	6 (60.0)	6 (42.9)	
Graduate degree (M.D., Ph.D., J.D., etc.)	7 (17.5)	3 (18.8)	1 (10.0)	3 (21.4)	
Family Income (per year), *n* (%)					p=.439
Less than $35,000	11 (27.5)	3 (18.8)	4 (40.0)	4 (28.5)	
$35,000 - 69,999	9 (22.5)	5 (31.3)	2 (20.0)	2 (14.3)	
$70,000 – 99,999	7(17.5)	3 (18.8)	1 (10.0)	3 (21.4)	
Above $100,000	11 (27.5)	4 (25.0)	3 (30.0)	4 (28.6)	
Individual Income (per year), n (%)					p=.311
Less than $2,000	31 (77.5)	15 (93.8)	8 (80.0)	8 (57.1)	
Above $2,000	7 (17.5)	1 (6.3)	1 (10.0)	5 (35.8)	
Religious Affiliation, *n* (%)					p=.334
Christian	19 (47.5)	7 (43.8)	6 (60.0)	6 (42.9)	
Muslim	8 (20.0)	3 (18.8)	3 (30.0)	2 (14.3)	
Buddhist	4 (10.0)	4 (25.0)	---	---	
Hindu	3 (7.50)	---	1 (10.0)	2 (14.3)	
Other	3 (7.50)	1 (6.30)	---	2 (14.3)	
Atheist	2 (5.00)	1 (6.30)	---	1 (7.10)	
Jewish	1 (92.5)	---	---	1 (7.10)	

*. Significant at the 0.05 level.

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Table 7. Inferential analyses, including M and SD, for student burnout outcome measure

Variable	Intervention Group (M, SD)			F	p-value	η^2
	Mindfulness Stress Reduction	General Stress Reduction	Waitlist			
Exhaustion	17.2 (3.71)	20.3 (4.76)	22.0 (3.53)	5.77*	.046	.238
Cynicism	11.4 (5.88)	13.2 (5.37)	11.9 (7.52)	.256	.776	.014
Personal Efficacy	28.3 (3.13)	24.6 (4.86)	24.9 (6.56)	2.38	.107	.114

MMBSR – Modified-Mindfulness Based Stress Reduction
SRSG – Stress Reduction Student Group (Active Control)
BIG – Brief Intervention Group (Inactive Control)
*. Significant at the 0.05 level.

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Table 8. Inferential analyses, including M, SD and Mean Rank, for theory of mind outcome measure

Variable	Intervention	N	Mean	SD	Mean Rank	H	p-value
First order Theory of Mind							
Cognitive (Cog1) - Proportion Correct	MMBSR	16	.917	.091	20.2	5.11	.078
	SRSG	10	.967	.058	26.7	--	--
	BIG	14	.851	.180	16.4	--	--
Affective (Aff1) - Proportion Correct	MMBSR	16	.958	.081	22.5	9.79*	.007
	SRSG	10	.992	.026	26.4	--	--
	BIG	14	.905	.086	14.0	--	--
Control (Phy1) - Proportion Correct	MMBSR	16	.914	.135	17.3	.311	.856
	SRSG	10	.925	.105	24.2	--	--
	BIG	14	.884	.180	21.6	--	--
Second order Theory of Mind							
Cognitive ToM (Cog2) – Proportion Correct	MMBSR	16	.789	.180	18.6	.815	.665
	SRSG	10	.863	.100	22.7	--	--
	BIG	14	.798	.212	21.1	--	--
Affective ToM (Aff2) - Proportion Correct	MMBSR	16	.792	.149	17.3	2.38	.304

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	SRSG	10	.892	.083	24.2	--	--
	BIG	14	.841	.153	21.6	--	--
Control (Phy2) – Proportion Correct	MMBSR	16	.823	.288	21.2	1.48	.447
	SRSG	10	.933	.161	21.1	--	--
	BIG	14	.881	.201	19.3	--	--

*. Significant at the 0.05 level.

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Table 9. Post-hoc comparisons of first-order 'affective condition, theory of mind outcome measure

Intervention	Intervention	Mean Difference	Std. Error	p-value
MMBSR	BIG	.054*	.027	.048
SRSG	BIG	.087*	.030	.007
MMBSR	SRSG	.033	.030	.223

*. Significant at the 0.05 level.

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Table 10. Inferential analyses, including M and SD, for overall EI and branch scores.

Variable	Intervention Group (M, SD)			F	p-value	η^2
	Mindfulness Stress Reduction (MMBSR)	**General Stress Reduction (SRSG)**	**Control (BIG)**			
Emotional Intelligence (MSCEIT)						
Overall Emotional Intelligence	90.6 (12.6)	86.9 (13.4)	93.7 (14.2)	.745	.482	.039
Positive-Negative Bias Score	105 (12.9)	108 (13.2)	101 (13.0)	.710	.498	.037
Branch Scores	--	--	--	.922	.504	.098
Perceiving Emotions	93.4 (14.8)	97.9 (14.8)	101.4 (15.0)	--	--	--
Using Emotions	91.3 (13.1)	86.4 (10.1)	96.2 (15.7)	--	--	--
Understanding Emotions	93.9 (12.7)	88.1 (16.4)	91.6 (13.8)	--	--	--
Managing Emotions	92.9 (10.2)	88.4 (13.7)	90.7 (10.7)	--	--	--

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Figures

Figure 1. Recruitment flow chart

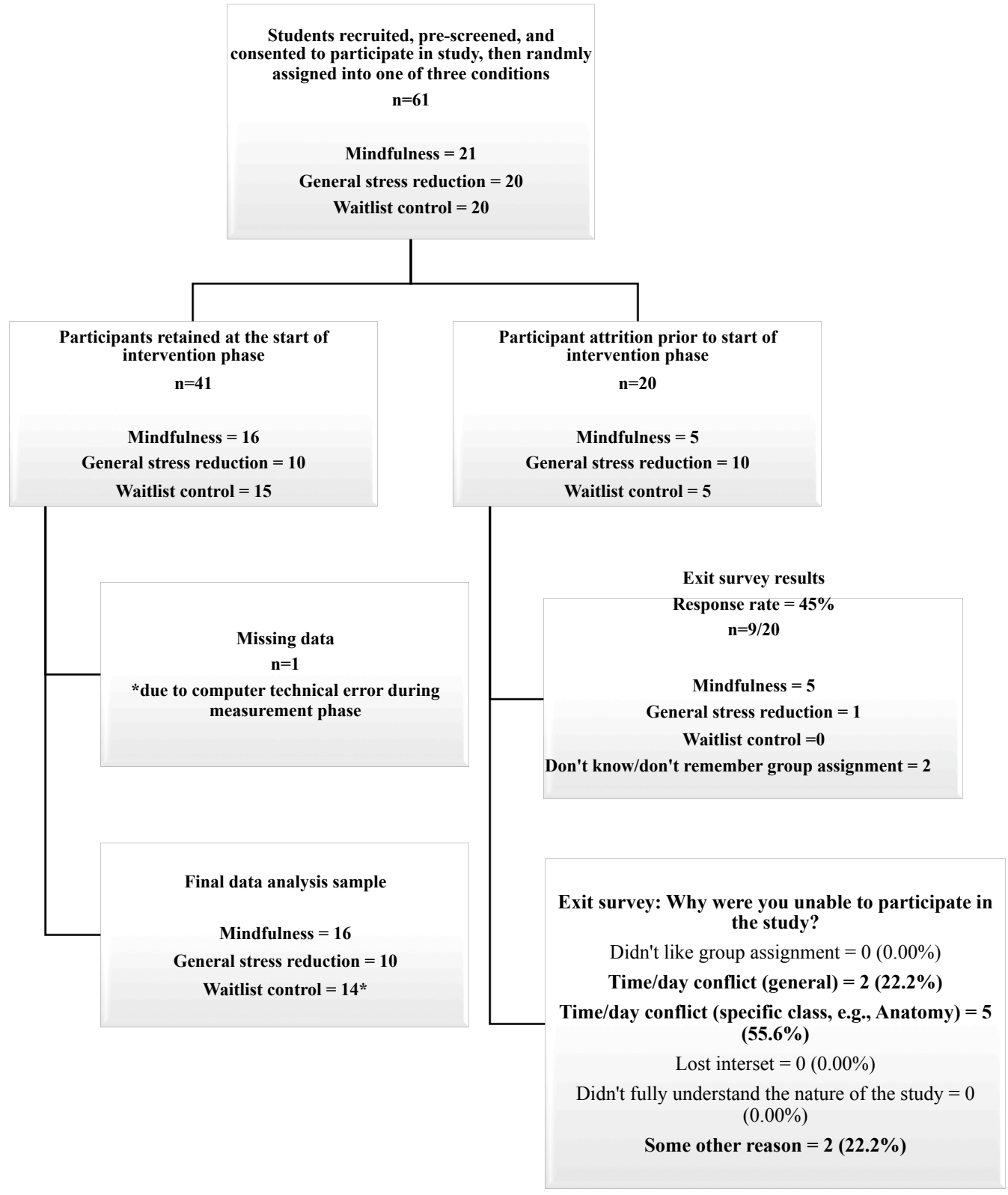

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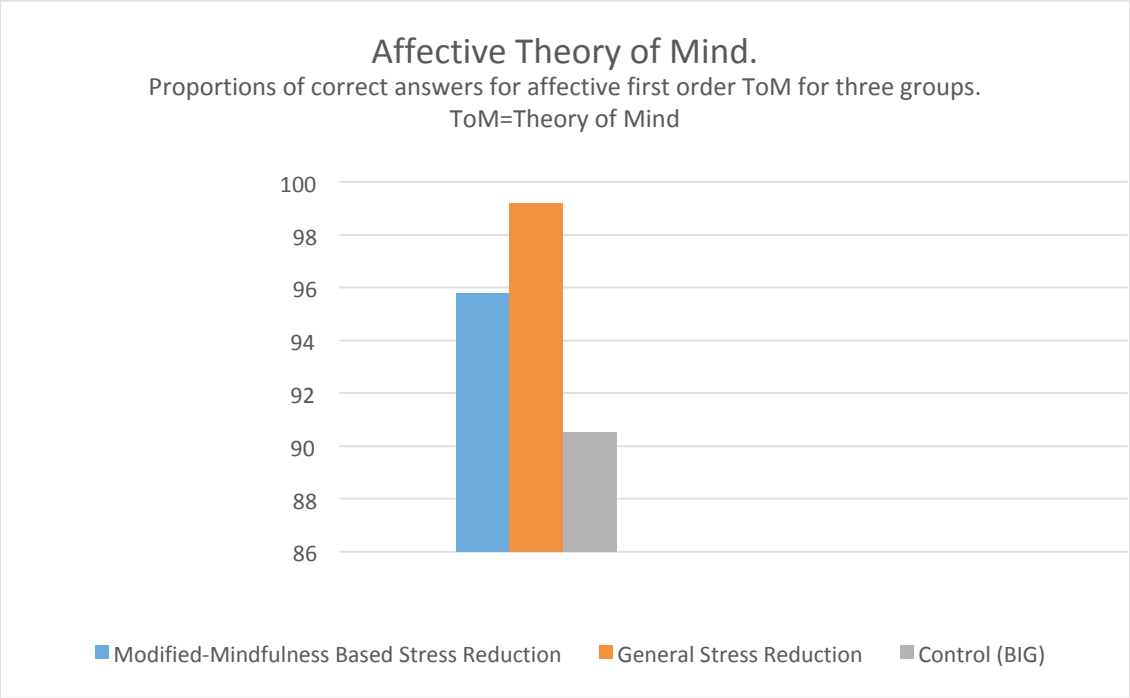
Figure 2. Proportion correct answers for first order ToM across conditions.



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Appendices

Appendix A

Comparison of Modified MBSR Training with Traditional MBSR Course

Feature	Modified MBSR Training	Traditional MBSR Course
Length	13 hours	29–33 hours
Training schedule	Each weekly session: 1 hours X8 weeks: 8 hours Half-day of mindfulness "retreat": 5 hours	Introduction: 2.5 hours Eight weekly sessions lasting 2.5–3 hours each Day of mindfulness lasting 6.5 hours
Content	Training in mindfulness practices (sitting, movement, speaking, listening, and compassion for self and others) and their application to practicing medicine and everyday life	Training in mindfulness practices (sitting, movement, speaking, listening, and compassion for self and others) and their application to everyday life
Length of encouraged at-home mindfulness practice	10–20 minutes daily	≥45 minutes daily
Class size	12-13	8–17
Resources provided	Headspace Mobile App™	Audio CDs for practice (Guided Mindfulness Meditation, Series 1 and 2) and *Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness* by J. Kabat-Zinn, PhD
Cost to participants	None	$475 at time of study with scholarships or partial rebates available from some insurers

Adapted from Fortney,Luchterhand, Zakletskaia, Zgierska, & Rakel (2013).

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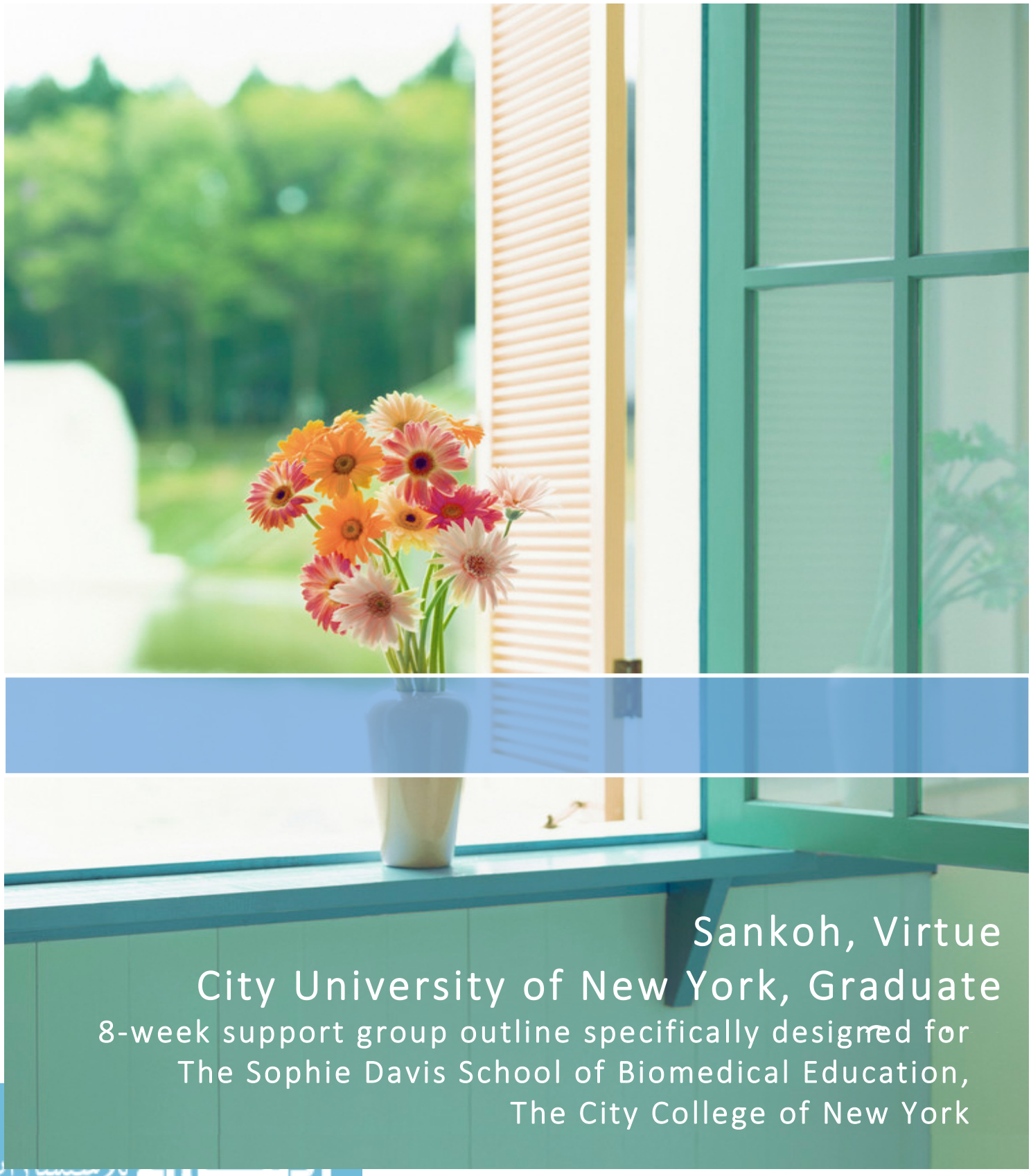
Appendix B

SRSG Handbook



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Week 1: Introduction

Objectives: Introduce members, break the ice, establish group ground rules, discuss roles of members and leader, and bond as a group

Methods:
Set up an atmosphere of acceptance, individual respect, and good humor

Confidentiality, commitment, and research disclaimer
Technical details of group – Day, Time, Closed Group
Discuss what support groups do.
Discuss Psychoeducational nature
Ground rules
Collective group is smarter than any one individual
To share truth that "You are not the only one going through this"
Acknowledge awkwardness of first sessions
Address attendance policy
Define role actions of leader at onset
Share my hopes for what they will get out of the group
Invitation for feedback on effectiveness of each proposed group session (written worksheet)
Going around and sharing top two favorite colors, and referral circumstances/ motivation/ inspiration ("what got me to group")

Members each write down 5 (or more) specific questions they have about stress reduction on separate notecards

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2. What is Stress? How Can I Manage It?

Objective: Further bond as a group, discuss stress – signs and symptoms, discuss short-term and long-term strategies for managing stress

Share what animal they would be and why
Confidentiality
Reminder of ground rules
Lemons and strawberries (Going around and sharing the lows and highs of the previous week)

I. What is Stress?

Stress is caused by two things: (1) whether you **think** situations around you are worthy of anxiety and (2) how your **body reacts** to your thought processes.
Fight-or Flight, Signs of stress, Severe signs of stress (discuss anxiety, depression, PTSD), Stress related to work or school (stress that feels like its inevitable)

Common misconceptions about stress (True or False)

- Stress is the same for everybody.
- Stress is always bad for you.
- Stress is everywhere, so you can't do anything about it.
- No symptoms, no stress.
- Only major symptoms of stress require attention.

II. How do I manage stress?
Group Work, Experiential: Break up into groups of 2-3.
Step 1: Identify what is causing you stress.
Step 2: As a class, with identified stressor in mind, use short-term strategies for reducing stress: Breathing, muscle relaxation, Laugh clip
Step 3: Make a change – Break into smaller groups of three themes (below). Each member considers how the theme can be used to lessen stress.
Step 4: Homework – Make that change!

- **Self-care -** regain your balance and lift your mood, get a good night's sleep and stop worrying, relaxation, Keep a sense of humor. Learn to laugh at yourself, and look for the funny and absurd in a stressful situation, Eat a healthy diet, get enough sleep, exercise regularly, and avoid substances that can mask your stress, such as alcohol and drugs, Journaling or blogging
- **Organization -** manage your time - at work and at home, improve your concentration and motivation, Set boundaries, learn to say no, and look for ways to trim back your to-do list and calendar, Daily routine, Efficiency and balance, Organization of living space
- **Looking outside yourself** - Campus resources, volunteering, strengthening spirituality, therapy, Spend time with people whose company you enjoy and, as much as you can, limit

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the time and energy you spend on people who stress you out, Change your environment: do errands online, change your commute, take a break from the news, take a walk to get away from the workplace at break time, set up some time to be alone.

3. Homework, Studying, & Taking Exams

Confidentiality
Reminder of ground rules
Lemons and strawberries

"Why do most people feel best the week before a holiday?" - because they usually get things in order.

Write it down! Anywhere, as long as you can look back at it.
Mom. Bank. – Don't write that. Be specific. "Buy mom's birthday gift"

Quiz (See Appendix for "answers")
First: Experiential noticing – do you feel stressed about taking a "quiz"?

When it comes to study skills, what is the 1:2 rule of thumb?
What is the difference between preparation for studying and actually studying?
Do you compare your academic performance to anyone else?
Do you cram for exams?
Do you have a planner?
Do you have academic goals for this semester? For this year? For next year?
Do you know your academic/studying strengths and weaknesses?
Do you only study when you have an exam?
Do you have a note-taking system?
Do you read over the syllabi for each class?
Do your professors know who you are?
What's your academic passion?
Do you have a resume?
Do you have a portfolio of your best work?
Have you ever used the Writing Center?
Does CCNY offer academic coaching?
Do you have a reliably quiet study space? Is it organized or messy?
Do you go to every class session?
Do you construct your own exams for study purposes?
Have you ever written a faculty member a thank you note?
Do you doze off in class? Or find that you've missed large portions of lecture?
Do you turn in all assignments – even if it isn't perfect?

Homework:
Choose three things from the do's and don'ts list that you can implement this week. Be prepared to discuss how it went.

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4. [Student led Discussion]

Here, we will use polling from the 1st class to present a discussion topic chosen by the student.

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5. Avoiding Distractions (Drugs, Alcohol, Internet, Gaming)

Avoiding smoking, drinking, drugs, and excesses of sugar, salt, fat, and caffeine'

What to watch for
It's easy to slip into ways of reducing stress that may seem to give you relief for a little while, but that can cause more damage in the long run.
Unhealthy habits you should replace with a healthier way of managing stress:

- Smoking
- Drinking too much
- Overeating or not eating enough
- Zoning out for hours in front of the TV or computer
- Withdrawing from friends, family, and activities
- Using pills or drugs to relax, outside of the advice from a doctor
- Sleeping too much
- Filling up every minute of the day to avoid facing problems
- Procrastinating
- Taking your stress out on others with anger or violence

What are your Top 3 Distractions?
What makes them distracting? Do they have an anti-stress function as well?
Pick one that you find the most disruptive.
How do you manage it now? How do you think you can improve on that management technique? Could you think of a new management technique?
Is that a short-term strategy or a long-term strategy?

Mental health self-monitoring
New identity development

We've talked about Short-term, long-term, Now personal identity
Perspective taking

Worksheet about changes made in personal identity

Tips:

- Identify decision points – after class, when you get home, when you get on the subway. Have a plan in place for those times, so you don't procrastinate.

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6. Work-Life Balance, Life of a Resident and Early Career Physician

In-session worksheet: "ex. I never...I always...I can't...I can…One thing about me that others would find surprising is….I love…I can't stand…etc."

A day in the life of a resident – reflection

Pulmonary Consult, Niruja Sathiyadevan, CB-Y (PGY-1)

I usually try to get up around 6:30 AM…although after hitting snooze several times, it's closer to 7:00 AM. After getting ready and drinking my coffee, I'm out of the door by 7:30 AM and at the hospital by 7:50 AM. Most mornings, there's something going on from 8-9:00 AM (medicine grand rounds, TB conference, chest conference, etc). After that, I start pre-rounding on my patients (about 4-5 patients for me, but depends on the census), and see any new consults (usually 1 consult daily). After lunch, around 1 pm, the pulmonary team (for me, it consisted of the attending, pulmonary & critical care fellow, third year medicine resident, medical student and me) would meet in the conference room and go over X-Rays and CT Scans from that day and then round on our patients. Depending on the day, rounds would last between 1-3 hours. Some days, there are afternoon teaching sessions, and most of the days, I would be done by 5:00 PM. I was planning on taking my USMLE Step 3 a few weeks after my rotation, so I used most of my free time to study…although, I did make sure to take some breaks to enjoy the beautiful Rochester summer!

https://www.urmc.rochester.edu/education/graduate-medical-education/prospective-residents/anesthesiology/resident-life/life.aspx

http://www.usnews.com/education/blogs/medical-school-admissions-doctor/2011/09/26/follow-a-day-in-the-life-of-a-medical-intern

A day in the life of a primary care physician – reflection

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Let me choose a “typical” Monday in October. At home, before going to the office I typed up a case report on a complicated patient that I was referring to a specialist. Arriving at the office at about quarter to eight, I looked over the laboratory, X-Ray, and CAT scan reports collected in my fax machine over night, deciding on which needed immediate attention and which I could attend to during the day. I filled out and faxed back four fax requests from pharmacies for refills.

I saw my first patient about 9:00 am, a woman who I had started on medication for shingles a week ago. She was recovering nicely.

Next, I responded to a fax report which showed a seriously low potassium level on a patient whom I saw last week. On large doses of diuretic for leg swelling which had not yet responded, he took it upon himself to double the dose. I called on his cell phone to put him on potassium pills. He was in Florida and because he is on a state program that doesn’t cover his medications in Florida he wanted just enough pills that he could afford till he returns home. I asked him to call me back with a phone number of a pharmacy there and I phoned in a prescription. I will re-check his potassium levels when he returns.

Sipping my coffee, I filled out two physical exam forms for a young couple planning to adopt. I leave a message on their answering machine to confirm that lab reports and chest X-Rays are normal but we still need a urine sample.

A few seconds after hanging up, I got a call from an 80 year old widow in the hospital. She had gone there right after her son had died over the weekend and was hospitalized with worsening of angina. The next day she was having a test to see if the stents in her coronary arteries were still open. I did my best to comfort her and filled out four more faxes from pharmacies for refills I gave to my nurse to fax back.

My next patient was a “walk-in,” without an appointment. An elderly widow in her eighties, she was very upset because the drugs for hypertension which used to cost her six dollars a month now cost over a hundred dollars. She was mad at the local pharmacist. I told her that it wasn’t his fault she is on a brand name drug and her insurance company will only pay for generics. I received a fax form from her mail order pharmacy and filled it out explaining that she needs the brand name medication because the generic didn’t control her blood pressure and gave her a headache. My nurse faxed the form back.

After my walk-in patient had calmed down and left, I saw a woman with diabetes. She was having minor hand surgery, and she just needed a letter from me okaying her for the procedure. I did a quick exam, wrote a short note to her doctor and gave it to her.

Next I received a phone call from a son whose mother is in her eighties, in a nursing home. She was recovering from knee surgery but the nurses there told her that her oxygen levels were low, and that her chest X-Ray showed “a little fluid and possibility of pneumonia.” I called the lung specialist who had seen her in the hospital for this problem and then I called her son back to fill him in. I also

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called the patient back at the nursing home to let her know I was on top of the situation. I also called the nursing home trying to speak with the doctor there. He wasn't there so I left a message on his answering machine recommending follow-up with the lung doctor.

The next patient was an elderly widow in her eighties for follow-up of respiratory infection. She was getting better but a rash she had had for several week was not getting better with treatment. I called a dermatologist and made an appointment for her.

I then answered a call from the sister of the patient who had died over the weekend. She was crying and I tried to comfort her.

A man in seventies whom I had seen for a respiratory infection the week before called wanting to know, since he was still "coughing a little," if should see him or just phone in more cough medicine. I phoned the cough medicine.

I then received a call from a woman asking for a tranquilizer. The pharmacist told me that he needed a hand-written script because she only uses the brand name. The pharmacist insisted on a hand-written prescription which I wrote and gave to my nurse to fax.

Next was a woman in her sixties complaining of neck pain. She had seen another doctor but was not getting better. In the course of my examination she broke down telling me that her husband needed a bone marrow transplant and that her insurance wouldn't pay for it until "he got sicker." After a normal exam, we both agreed that perhaps stress was the cause of her neck pain. I prescribed a tranquilizer and planned to see her in one week.

A patient with uncomplicated sinusitis followed. I phoned in an antibiotic.

Next, a woman in her eighties came in for a follow up of pneumonia.

After her I saw a woman for a sore throat, but she spent most of the visit talking about her husband's concerns over erectile dysfunction.

The patient after her complained of pain over the right eye and along the side of her head. My exam was normal and I considered migraine, but she wanted to see a neurologist because years ago she had had a concussion. I made the appointment for her.

The patient seen next was a follow up for a skin infection of the scalp.

After that a woman called and I phoned in her tranquilizer..

The daughter of the woman who was hospitalized with worsening of her angina called crying and upset because she just found out that her mom needed bypass surgery. I tried to comfort her.

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Sipping another cup of coffee, I phoned in a cholesterol report to patient who had had a stroke.

My most difficult challenge of the day was not medical but an administrative problem. A patient I had taken care of for years had recently gone on state aid had been getting his medical care at a community health clinic. His complaint was sore throat and chills. I told him it was a viral infection and that an antibiotic was not needed and to take Tylenol for fever and muscle pains.

He mentioned that he also had some weakness and tingling in his right arm for several months. My exam confirmed the weakness. The specialist I wanted to see him didn't see state aid patients and his office referred me back to the clinic.

The patient told me that the clinic dropped him because he made $14,000 a year which was above the limit for coverage. I called the clinic's main number and was referred to the financial office, whose receptionist told me that the patient had it all wrong. Apparently he was supposed to save his bills and once they reached $1,000 a process called "spend down" was supposed to go into effect. Then the clinic was supposed to pay for his care.

I told him to save him to save his bills. I got him an appointment to see a neurologist at the clinic but it wasn't until February 2010. I ordered an MRI of his neck to rule out nerve compression. The hospital will do the tests even though he is on state aid. I will see him in one week and when I get the report I will speak to the neurologist.

These are the various services I provided. I left the office at 4:30 pm. Much of the time that I spent with my patients was administrative. It was time-consuming and tiring. Most primary care doctors, have similar "typical" days. Some are much busier and see a wider range of diseases and patients. Some still make hospital and nursing home rounds as I once did. Some have weekend hours and night time hours. Their practice styles depend on their skills and their financial goals and their ages. http://www.kevinmd.com/blog/2009/12/typical-day-primary-care-doctor.html

http://www.aafp.org/medical-school-residency/choosing-fm/lifestyle.html
Family issues
Homesickness
Changing role in family
Attention needed back home
Cultivating interests and hobbies
Conflict management
Assertiveness (rights and needs)

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7. [Student led Discussion]

Here, we will use polling from the 3rd class to present a discussion topic chosen by the student.

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8. Closing

Personal development overview
Development of personal goals
Strengths-identification and building

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Appendix

Teacher Workbook

Week 2: Stress

Fight or Flight
Stress happens when we feel that we can't cope with pressure and this pressure comes in many shapes and forms, and triggers physiological responses. These changes are best described as the fight or flight response, a hard-wired reaction to perceived threats to our survival. When survival had meant facing immediate and real threats such as confronting a charging elephant, our response has saved lives.
The effects of stress can be emotional, psychological, and physical. Signs of stress are different in everyone, with some people expressing more physical signs, like fatigue or high blood pressure, and others expressing more emotion or psychological signs, like irritability or depression.

Signs of Stress:

Irritability
Depressed mood
Anxiety
Easily angered or frustrated
Fatigue
Trouble falling or staying asleep
Loss of appetite or overeating
Trouble concentrating
Problems with memory
Muscle aches
Headaches
Upset stomach
Rapid heartbeat

If stress lasts too long or happens too often, it can lead to more serious problems such as anxiety or depression, and physical health problems such as heart disease and obesity. According to the American Psychological Association, the majority of office visits to the doctor involve stress-related complaints, and stress is linked to the six leading causes of death: heart disease, cancer, lung ailments, accidents, cirrhosis of the liver, and suicide.

Common misconceptions about stress (True or False)

Stress is the same for everybody.
Stress is different for each of us. What is stressful for one person may or may not be stressful for another; we all respond to stress in different ways.

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Stress is always bad for you.
According to this view, having no stress would make us happy and healthy. This is not the case; stress is a natural human response to changing conditions around us. Stress prompts us to grow and adapt to changes. Even the most positive life events involve stress. The issue, really, is how to manage it. Managed stress is part of being productive and happy; out-of-control stress is harmful.

Stress is everywhere, so you can't do anything about it.
You can plan your life so that stress does not overwhelm you. Effective planning involves setting priorities and working on simple problems first, solving them, and then moving on to more complex difficulties. When stress gets overwhelming, it is difficult to prioritize events and responsibilities in your life. All your problems seem to be equal and stress seems to be everywhere. Taking active steps to cope and manage stress can reduce it to a more comfortable level.

No symptoms, no stress.
An absence of symptoms does not necessarily mean the absence of stress. In fact, camouflaging symptoms -- for instance, with drugs or alcohol -- may deprive you of the natural signals you need to reduce the strain on your body and mind.

Only major symptoms of stress require attention.
This myth assumes that “minor” symptoms, such as headaches or stomach acid, may be safely ignored. Minor symptoms of stress are the body’s natural early warning system and can prompt you to take steps to manage your stress.

You Are Not to Blame: Some Stresses Can't Be Avoided
Try as we might, sometimes we can't avoid stressful situations or avoid being under stress. Some stresses are forced on us. The terrorist attacks on our nation September 11, 2001, brought this issue to light when people around the country found themselves unable to sleep, feeling under pressure, experiencing depression, and showing other symptoms in reaction to the trauma of the attacks.
People who experience traumatic events, such as terrorist attacks, life-threatening situations, natural disasters, serious accidents, or personal assaults can suffer from an extreme form of stress call Post Traumatic Stress Disorder or PTSD. PTSD is a psychiatric disorder and people who suffer from it often relive their traumatic experiences through nightmares and flashbacks, have difficulty sleeping, and feel detached or estranged. PTSD can occur at any time - days or even years after a traumatic event. It is often accompanied by depression, substance abuse, memory problems, and other physical and mental health problems. The disorder can affect people's day-to-day life, including their ability to function socially.
Similar to PTSD, other forms of chronic stress, often brought on by life situations that are out of our control, such as having a disability, can be difficult to manage. The constant stress of spending the rest of your life looking for a curb cut, ramp, or step-less entrance can add up and increase your overall stress.

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People who experience PTSD or chronic stress should seek help from professionals - some burdens are too great to bear alone. Although there is no perfect treatment for PTSD or chronic stress, there are a variety of medications and psychotherapies that can greatly improve the quality of life of people with severe stress problems.

If you are experiencing any of the following, it may be time to seek help from a healthcare provider:

- You feel trapped, overwhelmed, or helpless
- You are experiencing physical complaints from stress, like unusual fatigue, headaches, sleeplessness, or inability to eat
- You are drinking or using drugs to relax and cope
- You feel worried all the time and can't concentrate

Homework: Make a Change!

Quick Fixes to Physical Effects of Stress
4 Things In 5 Minutes! Four quick tips for relaxing on the spot.

1. **Breathe deeply** - take several deep breaths to slow down your heart rate and reduce your anxiety.
2. **Relax your muscles** - stretch your neck, stand or sit up straight, get some of the tension out of your body.
3. **Make a change** - step back from what you're doing and/or what's stressing you; a few seconds can bring a lot of perspective.
4. **Laugh** - nothing relieves the tension in your body, or your mind, like a little humor.

Long-term Strategies for Dealing With Stress
Identify what is causing you stress.
Don't ignore or gloss over your problems. If something is bothering you, identify what it is. If you think it shouldn't be bothering you, stop and ask yourself why it does -- maybe something larger is bothering you and it has seemed easier to focus on the small things. This may help you cope in the moment-to-moment, but eventually you must face up to your larger issues. Taking the time to identify the serious stressors in your life will help you come up with a strategy for managing them.
Recognize what you can change.
Can you change what's bothering you? If not, can you change your response to the problem or learn to channel your frustration in another way? People find comfort in patterns, even if those patterns are stressful. Maybe it's time to change those patterns. If your relatives criticize your cooking every time you invite them to dinner (and you aren't ready to stop seeing them altogether), maybe you could suggest dining out or throw a pot-luck dinner where everyone brings a dish. Or maybe you can chime in and begin making outrageous jokes about how if they don't like your tapioca you can always use the leftovers to re-caulk the bathroom. If you can't change your stressors in life (such as critical relatives), maybe you can change the situation (different environment) or your response (humor) to lessen the most stressful situations.

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Reduce the intensity of your reactions.
Should you be reacting so strongly to the situation? Sometimes, we need to put things in perspective. You may be overreacting and seeing the situation as more stressful than it is. Take a breath; walk out of the room; accept that no one's perfect, including your parents, coworkers, teachers, children, and yourself. Step back and ask yourself if what's bothering you deserves all your attention and energy. Maybe the time you're spending worrying could be better spent on improving your life and the life of those around you.
Re-examine your attitudes and 'obligations'.
Are you putting yourself under too much stress? Are you trying to be all things to all people? Sometimes in trying too hard to do good for others, we aren't doing well for ourselves.
Stop and examine your priorities in life -- and don't forget to name yourself as one of those priorities. Is working overtime for that new television worth the quality time you're sacrificing with your family and friends? Can't take an hour out of your busy week to relax in a bath or read your new magazine but find yourself volunteering to help every family member, friend, coworker, and acquaintance? Feel that you're depriving your family by buying a frozen dinner instead of preparing one from scratch although you've worked a ten-hour shift and need to sleep? You don't want to set the bar too low, but you don't want to set it so high that it's overwhelming.
Ask yourself what you would expect from other people, and expect the same from yourself. Learn to forgive yourself and others when, on occasion, you can't meet those standards -- it's called being human. And learn to accept help. Ask your family, friends, or partners for assistance. Instead of straining your relationships, you may find this helps. By handing over responsibilities to others (and letting them handle them their way, not 'your' way), you're building trust and making them feel an important part of the process.
Organize yourself.
Are you spreading yourself too thin? Are you more productive during certain times of the day? Overwork and fatigue are one of the most common causes of stress. Maybe you are taking on too much: learn to say no to things that will not affect your job, school or relationships. Spending time with family and friends is important, but sometimes you need down time and time to rest. Are you managing your time well? If you work better in the morning, plan your big tasks for morning. If you're a night owl, plan your important tasks for later in the day. Visit the **Tools and Resources** area for a checklist of recommendations to improve your organizational skills.
Develop emotional supports and use them.
Do you have someone you can talk to about your life? Having someone you can share both the good and bad with is important. If you have a large group of friends, lean on them in times of difficulty; you wouldn't turn them away if they needed you, would you? If you don't have a large network, start to build one. Join a group or organization where people will share your interests. Get out there -- even if it's just a trip to the grocery store, gym, library or WalMart; you never know who you may bump into. Seek assistance from professionals (health care, counselors, religious advisors) who are experienced and comfortable in giving support. Most of all, be your own best friend: accept any flaws or the occasional failure; make the most of your abilities and successes.
Let it all out.

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Laugh. Cry. Scream. Sometimes you need to let out your emotions and few tools are better than the ones nature gave us. Saving these emotional outbursts for a private, comfortable setting is important -- crying, screaming and laughing hysterically at work or school will more likely add to your stress, after the fact, than reduce it.
But what's wrong with having a good cry? Or a good belly laugh? Or a good yell (though certainly not directed at anyone in particular and preferably in the privacy of your car, closet, or pillow, so no one notifies the police). These mechanisms offer some of the most immediate means of stress relief -- they just shouldn't be your only way of dealing with stress.
Society often judges people who can't control their emotions or behavior, and letting go around friends and family can sometimes result in hurt feelings. But occasionally unleashing your full fury on the dresser you always bump into in the middle of the night or having a good cry on the shoulder of a loved one could leave you more relaxed and relieved than any amount of time management, deep breathing, or rational discussion.

Week 3: Homework, Studying, and Exams

Goals: continued group cohension, encourage group process around homework material, education around time management, studying skills, and organization tips

Confidentiality
Reminder of ground rules
Lemons and strawberries

“Why do most people feel best the week before a holiday?” - because they usually get things in order.

Write it down! Anywhere, as long as you can look back at it.
Mom. Bank. – Don’t write that. Be specific. “Buy mom’s birthday gift”

Tech Organizing Platforms - developing a "trusted system"

Evernote
Asana
Nirvana - Getting Things Done (GTD) Software
Momentum - Chrome Plug-In
Bullet Journal (analogue)

Study skills discussion - Most of the work is done outside the classroom. Rule of thumb: one hour of lecture, two hours of preparation. As soon as the semester starts, find yourself a quiet place to study and block out the times of the week you're going to do the studying. Above all, don't count study-related activities as actual studying: copying over your notes, getting the e-

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readings, listening to the lecture again, and "getting acquainted" with your study group are all fine activities, but they don't count as studying.

First: Experiential noticing – do you feel stressed about taking a “quiz”? Limit self-criticism.

Stress Reduction Student Group Quiz #1

1. Do you have a planner?
2. Do you know your academic/studying strengths and weaknesses?
3. What is the difference between preparation for studying and actually studying?
4. Do you compare your academic performance to anyone else?
5. Do you have a note-taking system?
6. What’s your academic passion?
7. Do you have a resume?
8. Have you ever written a faculty member a thank you note?
9. Do you doze off in class? Or find that you’ve missed large portions of lecture?
10. Do you turn in all assignments – even if it isn’t perfect?

BONUS:

Do you have a reliably quiet study space? Is it organized or messy?

Do you have academic goals for this semester? For this year? For next year?

This Week’s Homework:
Do’s and Don’ts

Do turn in all assignments. It's better to hand something in late than not at all; a zero can really hurt your course grade. If you're struggling with an assignment or you fall behind, talk to your instructor -- in advance, not the day said assignment is due. Professors are human too (well,

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most of them are, anyway) and some will consider giving you an extension, especially if you show evidence of progress on the assignment.

Do consider breaking up your studying into smaller chunks throughout the day; you'll face less burnout, have more time flexibility, and retain more information by doing so.

Don't compare your academic performance to anyone else. Each person is unique, and comparing yourself to others just sets you up for disappointment -- or worse, failure.

Do buy a planner and/or develop a system for keeping track of all your assignments, readings, and papers -- most of which you can get from the syllabus of each course you're taking.

And **do** invest in some time management education if you do not have much experience juggling multiple demands on your time (including classes, homework, friends, clubs, sports, social gatherings, group meetings, etc.)

Do set reasonable -- and achievable -- academic goals each semester. Push yourself to perform at your highest level, but **don't** make those goals so high that you fall into a downward spiral.

Do take time to review your current studying strengths and weaknesses. By understanding yourself better, you'll be able to maximize your strengths while overcoming -- or at least minimizing -- your weaknesses.

Do develop a regular time to study and read your textbooks, but **don't** make that time late at night or while lying in bed. And **do** finish the readings that are assigned for each class -- so you can be better prepared for understanding and questioning the lectures and participating in discussions.

Do develop a good note-taking system -- both for reading assignments and for class lectures. Find a system that works for you, such as outlining, or develop your own.

Do read all of your syllabi carefully**.** The syllabus is your contract for the course. There's no excuse for not being aware of essential information that has been provided to you. In addition, check your email account daily; faculty and staff members will use email to communicate additional information to you.

Do connect with your professor (or TA). The single most underutilized resource at college is the office hour, now available in-person, by e-mail, or by Skype. You might not have realized it, but professors are required to be in their office two to four hours a week to meet with students and help them with the course. Your tests and papers will go better if you've had a chance to ask about things you're confused about, and, with any luck, received some guidance from the professor about what your thesis sentence should be or what's going to be on the test.

Do say thank you. If you enjoy a course, let the professor know. S/he will appreciate it, and it may help the instructor to remember you. You never know when you'll need a letter of

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recommendation or a reference for an internship, a job, or graduate school. When professors write you letters of recommendation, send them a thank you note (the kind from the olden days that involve a pen and an envelope!). Writing recommendation letters is a time-consuming task and one that instructors don't *have*to do; let them know you appreciate it. And if you get into that international program or grad school or get the internship or job, let your professor know. Nothing makes them happier than seeing you succeed. This is why professors do what they do.

Don't be anonymous**.** Introduce yourself to your professors and speak up in class, especially if you attend a large university with huge class sizes. I'm not saying you have to sit in the front row, answer every question and bring the instructor chocolates (did I say chocolates? I meant apples). Just don't hide in the back of the room and be invisible. Moreover, don't hesitate to ask questions in class; if you're wondering about something, chances are that someone else is too. If you think of a question outside of class time, visit the professor during office hours (that's the *purpose* of office hours) or send an email.

Do pursue your passion**.** Amidst all the distribution courses, general education requirements, prerequisites, and must-do's for the major, it's easy to forget what your intellectual interests, gifts, and passion were in the first place. Each semester, be sure to take at least one course in something you're good at and are really interested in. The joy of doing something you enjoy—and doing it well—will go a long way to making up for all the unpleasant things you have to do at college. Guaranteed.

Do find and prepare your study space. Some people do their best work in coffee shops. Some demand 100% peace and quiet and find libraries and out of the way nooks in buildings on campus. Some need the comfort of their rooms. Wherever you choose to study, it's important you find a space that's right for you.

Do work to improve your writing. Take advantage of the writing center and tutors at your school. You won't regret it. Learn how to use commas and semi-colons; they're important. For instance, the difference between "Let's eat, grandma" and "Let's eat grandma" is a dead grandma and my thinking you're a cannibal. In addition, 'there,' 'their' and 'they're' are three different words with three different meanings. For the love of God, please learn how to use these words, and other homonyms, correctly.

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