

SCHOOL-BASED MINDFULNESS AND YOGA WITH YOUNG ADOLESCENTS AS AN
ENHANCED HEALTH AND PHYSICAL EDUCATION CURRICULUM

by

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Little is known about the effects of mindfulness-based intervention and yoga implemented with adolescents in school settings, especially regarding evaluation of specific outcomes compared to alternate Health and PE curriculums. The current study describes the effects of a mindfulness and yoga enhanced Health and PE curriculum compared to an active control Health and PE curriculum on stress, mechanisms of mindfulness, emotional self-regulation, and other psychological outcomes. Participants (N=80) were recruited from five, ninth grade classes in a rural, public high school. A mindfulness intervention was implemented with whole classrooms (N = 49) twice per week for 30 minutes, after delivery of a 30-minute yoga session, over six weeks during Health and PE class. The classes in the active control condition (N = 31) participated in a *Stress Management and Coping Skills program (SM&C)* delivered in the same format. Data was collected regarding feasibility, acceptability according to teachers, administration, and students, as well as efficacy of the programs at initial, end of treatment and follow up time points. There were not significant differences between treatment and active control groups in student reported stress, overall difficulties in emotional regulation, symptoms of depression, or disruptive behavior between groups at posttest or follow up. Participation in the *SM&C program* predicted significantly lower posttest *SCARED* GAD scores

compared to the *L2B* condition. Participation in the *L2B* condition buffered decreases in academic efficacy scores on the *PALS Academic Efficacy* subtest at follow up compared to the active control condition. Participants in the mindfulness intervention did not show significant changes in stress, emotional regulation, or the development of mechanisms of mindfulness compared to the active control condition. This study highlights that mindfulness programs can be challenging to implement with adolescents in large groups in school settings and that considerable planning is needed to minimize disruption and facilitate effective delivery. Implications for future research and practice are provided including considerations for implementation within a Multi-Tiered System of Supports framework, ensuring effective classroom management is in place, further tailoring programming to developmental needs of adolescent students, and providing training and involvement of teachers and school staff.

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CHAPTER I: INTRODUCTION

Stress and Mental Health in Adolescence

Adolescence is a challenging life period associated with many developmental transitions including substantial hormone changes during puberty, physical growth, increasing autonomy and expectations, and increases in peer influence (Blakemore, 2008). Adolescents deal with a variety of stressors arising from many sources including challenges of learning and achievement, family-system disturbances, peer-interaction conflicts, socio-cultural factors, and vulnerabilities to physical and mental health risk influences (Meiklejohn et al., 2012). Adolescents also encounter stressors related to fitting in with peers, body image issues, dating, and sex (Neff & McGehee, 2010). When youth are overwhelmed by negative psychological stressors, they are at increased risk for developing psychological disorders (Edwards, Adams, Waldo, Hadfield, & Biegel, 2014). Excessive stress damages the architecture of the developing brain which leads to vulnerability to lifelong problems in learning, behavior, and overall health (National Scientific Council on the Developing Child, 2007). Adolescents with elevated levels of stress have been found to have lower academic competence than their typical or low stress counterparts (Rew, Grady, & Spoden, 2012). Many learning, behavioral, attentional, and/or mental health problems are stress sensitive or stress induced. The diathesis stress model states that disorders are a combination of genetic predisposition and environmental stress and evidence has been found that this model applies to depressed adolescents (Braet, Vlierberghe, Vandevivere, Theuwis, & Bosmans, 2013). Therefore, providing ways to manage stress may be a helpful way to protect adolescents from developing or exacerbating academic or mental health problems (Meiklejohn et al., 2012).

As many as one in five adolescents experience distress due to a psychological disorder and many disorders have comorbidities that complicate treatment (Merikangas et al., 2010). It has been estimated that six to nine million youth have a diagnosable psychological disorder that impairs their functioning at home, at school, or in relationships (U.S. Public Health Service, 1999). Some evidence indicates a substantial rise in psychosocial disorders affecting young people occurred over the second half of the twentieth century (Rutter & Smith, 1995). Increased intensity, as opposed to prevalence has been the more recent trend in adolescent mental health (Achenbach, Dumenci, & Rescorla, 2003).

According to a national survey, the most common mental health disorders for adolescents include anxiety disorders (prevalence of 31.9%), mood disorders (19.1%), and substance use disorders (11.4%) (Merikangas et al., 2010). Approximately 40% of adolescents diagnosed with one disorder also meet criteria for a second psychological disorder. Youth with Attention-Deficit/Hyperactivity Disorder (ADHD) typically have symptoms of inattention, hyperactivity, and impulsivity, as well as also often have comorbid problems affecting mood, opposition/defiance, anxiety, and learning (Pliszka, Carlson, & Swanson, 1999). Youth diagnosed with a mood disorder are often found to have a comorbid diagnosis of ADHD, anxiety disorder, oppositional defiant disorder (ODD), or conduct disorder (Merikangas, Nakamura, & Kessler, 2009). Mood disorders often develop during adolescence, with approximately 21-28% of adolescents experiencing an episode of major depression by the age of 19 years (Hankin et al., 1998). Adolescence is also a risk phase for the development of anxiety disorders (Beesdo, Knappe, & Pine, 2009) and almost one in every three adolescents suffers from anxiety disorders (Merikangas et al., 2010). Negative outcomes related to mental health disorders include poor academic achievement, poor peer relations, and low self-esteem (Greenberg, Domitrovich, &

Bumbarger, 2001). The negative impacts of a psychological disorder on functional outcomes is often high, as half of all students fourteen and older who receive special education due to emotional disability drop out of high school, the highest dropout rate for any group receiving special education in public schools (U.S. Department of Education, 2001).

Adolescence in Rural Areas

Adolescents from rural areas face increased exposure to poverty, as most of the poorest counties in the United States are rural (Johnson & Strange, 2007). Poverty is associated with several factors that put adolescents at increased risk for stress, obesity and overweight, and unhealthy lifestyle habits. Limited availability of and access to healthy foods and beverages and poor food choices (fast food is cheaper and more easily accessible), fewer physical activity opportunities (lack of accessible and safe places to exercise); no available transportation to stay after school and participate in sports, dance, and other physical activities; and low population density that prohibits safe walking and lack of recreation centers all contribute to increased risk for poorer mental and physical health outcomes for adolescents in rural areas (Boehmer, Lovegreen, Haire-Joshu, & Brownson, 2006; Liu, Harun, Zheng, Probst, & Pate, 2007).

One recent study (Tovar et al., 2012) found that most youth living in rural areas are not meeting health recommendations and have higher levels of screen time exposure than recommended. Seventy-five percent of parents reported their child sleeps less than the recommended amount per night, and 40% of parents reported their child eats less than the recommended amount of fruits and vegetables per day. Tovar and colleagues (2012) also found that rural youth are more likely to consume calories from soda and sugar sweetened beverages which corresponds to an increase in calories per day. These factors are hypothesized to explain why half of rural youth are overweight or obese compared to national rates of nearly one third of

youth (Tovar et al., 2012). These issues lead to increased risk for negative health outcomes for adolescents living in rural areas, too often leading to long term physical and mental health problems.

Youth in rural areas are also especially vulnerable to problems related to psychological disorders due to a lack of access to adequate mental health care (Lutfiyya, Bianco, Quinlan, Hall, & Waring, 2012). Lack of providers in the geographical area can make linking services to those in need more difficult than in urban settings, where providers tend to be numerous in small geographical areas (Chan, Hart, & Goodman, 2006). Longer travel times and distances and lack of public transportation in rural areas limit access to health care that is available. Evidence has shown that only about twenty percent of youth with mental health disorders are receiving the mental health services they need (U.S. Public Health Service, 2000). Thus, efforts need to be increased, especially in rural areas, to reach the many children who do not have access to mental health services (Greenberg, Domitrovich, & Bumbarger, 2001).

Prevention: Targeting Risk and Protective Factors

Prevention is a crucial part of maximizing outcomes for youth, especially due to the limitations associated with treatment availability and access to care in rural areas (Mendelson & Tandon, 2016). Given the risks associated with living in rural settings combined with the unique features related to the developmental time of adolescence, more innovative prevention efforts may mitigate the heightened risk of the development of mental health problems in adolescence (Greenberg, Domitrovich, & Baumbarger, 2001). A continuum exists which ranges from primary prevention (including a focus on wellness or competence enhancement), secondary prevention approaches that include programs targeting problems early after their onset, to tertiary

prevention which includes ameliorating severe/chronic problems in ways that prevent exacerbating the conditions (Adelman & Taylor, 2010).

There is accumulating evidence that psychological disorders, including depression, can be universally prevented via environmental modification and skills promotion (Calear & Christensen, 2010; Mendelson & Tandon, 2016). Due to the heterogeneity of disorders experienced by many different adolescents, it is important to seek approaches that have positive effects on a variety of disorders and therefore would be beneficial to many or all adolescents, as opposed to narrow clinical populations (Greenberg, Domitrovich, & Bumbarger, 2001). Risk factors for youth developing disorders have been reported to fall into seven broad categories: constitutional handicaps, skill development delays, emotional difficulties, family circumstances, interpersonal problems, school problems, and ecological risks (Coie et al., 1993). Although there is no single cause of any disorder, many risk factors relate to many different negative outcomes, and risk factors often co-occur (Cicchetti, 2006; Greenberg, Domitrovich, & Bumbarger, 2001). Furthermore, there are multiple pathways to most psychological disorders and often multiple risk processes operate additively and/or synergistically with exponential effects, amassing greater potential that psychopathology will ensue (Cicchetti, 2006).

Prevention and intervention efforts should focus on managing and mitigating multiple common risk factors as opposed to focusing on treating a single disorder (Greenberg, Domitrovich, & Bumbarger, 2001). Similarly, enhancement of malleable protective factors should also be a focus of prevention and intervention efforts. Protective factors promote competent development and reduce the negative impact of risk factors (Cicchetti, 2006). Protective factors can build resilience by counterbalancing the impact of risk processes and reducing the likelihood that a risk process will eventually lead to maladaptive or

psychopathological outcomes (Cicchetti & Aber, 1998; Luthar, Cicchetti, & Becker, 2000). While not all risk and protective factors are able to be modified for everyone, identifying prevention strategies that enable individuals to more effectively operate within a variety of contexts can be beneficial. By specifying links between protective factors, positive outcomes, and reduced problem behaviors, prevention research may be more able to identify relevant targets for intervention (Coie et al., 1993).

Schools as Environments for Prevention

Given the principle that the development of humans is strongly influenced by context (Bronfenbrenner, 1979), prevention strategies that are implemented in the pre-existing environment of the individual are most likely to have an impact on their development and generalize to other aspects of their life. Schools are ideal places to implement prevention strategies that promote healthy brain development and foster stress resilience, as most children attend school (Meiklejohn et al., 2012). Given students with positive psychological well-being are more likely to function better in school (Diamond, 2010; Patel, Flisher, Hetrick, & McGorry, 2007), schools need effective, cost efficient ways to implement prevention of psychological disorders (Weist et al., 2000; Lee, Lohmeier, Niileksela, & Oeth, 2009).

Prevention programs in schools are relatively few and many schools would benefit from reorganizing their curriculums to include prevention programs (Dwyer & Van Buren, 2010). Approaches to screening for universal health and wellness as well as prevention programs may be school-wide, targeted, or intensive. School based universal prevention can be implemented with an entire school community to develop skills for healthy social and emotional functioning and protect against psychosocial difficulties. Much of the effectiveness of universal prevention has been evaluated in early childhood or elementary schools (Cook et al., 2015; Schindler et al.,

2015) with less attention paid to development of needed skills during adolescence. Therefore, more information regarding effective universal and primary prevention programs is needed to promote positive psychological and functional outcomes for adolescents in schools (Greenberg, Domitrovich, & Bumbarger, 2001).

Self-Regulation

As individuals move from childhood to adolescence, they must acquire skills that enable them to maneuver through their multiple, often stressful environments effectively. The ability to control reactions to stress, maintain focused attention, and interpret mental states within oneself and others is termed self-regulation (Fonagy & Target, 2002). Self-regulation attempts to account for how children achieve the ability to regulate their emotions, behaviors, and thought processes (Rueda, Posner, Rothbart, 2011). Typical developmental progression requires utilization of self-regulatory instead of reactive behaviors as youth move from reacting to internal and external stimuli towards modulating their behavior based on social expectations and personal goals (Rothbart & Rueda, 2005). Chronic stress can impair abilities required for task persistence and self-regulatory behavior, generating increased reactivity to the environment and decreased ability to modulate emotions and behavior (Eisenberg, Fabes, & Guthrie, 1997). When teens lack self-regulatory skills amidst newfound autonomy, a myriad of negative outcomes can ensue which include implications regarding performance in school (Blair & Razza, 2007) and social emotional development (Bierman et al., 2008).

Across disciplines, self-regulation is generally related to the ability to follow through with goal directed activities over time and across environments (Karlovy, 1993). Self-regulation has been described as “the key mediator between genetic predisposition, early experience, and adult functioning” (Fonagy & Target, 2002, p. 307). Kim, Brody, and Murray (2003) found that

higher levels of early adolescent self-regulation positively predicted academic performance on letter word identification and math calculation tasks ($\beta = .53$) and negatively predict conduct problems ($\beta = -.83$) in rural African American adolescents four years later. Self-regulation at 10 years old has been found to predict physical health, substance dependence, personal finances, and criminal offending outcomes over the next thirty years (Moffitt et al., 2011) which suggests that interventions addressing self-control might not only benefit the individual, but also reduce a variety of societal costs, save money, and promote prosperity.

Emotion Regulation.

The development of self-regulation is a critical skill that requires the integration of emotion and cognition (Blair & Razza, 2007). Emotion regulation has been defined as “the intra- and extraorganismic factors by which emotional arousal is redirected, controlled, modulated, and modified to enable an individual to function adaptively in emotionally arousing situations” (Cicchetti, Ganiban, & Barnett, 1991, p. 15). According to Barkley, emotional self-regulation represents a “conscious, top-down and effortful (executive) moderation of the initial emotional reaction” (2015, p. 81).

Barkley (2012) asserts that “emotions are motivational states that undoubtedly play an important role in evaluating and determining one’s means (actions) and ends (goals) and their social appropriateness and contribute to the drive, willpower, and self-motivation that will be needed to achieve them” (Barkley, 2012, pp. 26). Consistent with this theory, Barkley (2015) considers deficient emotional self-regulation as a core component of ADHD which deserves to be represented in conceptualizations of the disorder, in its current theories, and in the diagnostic criteria. This acknowledgement contributes to the understanding of the high comorbidity of ADHD and ODD and the social impairment associated with the disorder. Consistent with

developmental psychopathology framework (Cicchetti, 2006), emotion regulation skills can be viewed as capacities that can foster positive developmental trajectories or hinder development, depending on their articulation and other social, dispositional, and biological resources available to the individual (Eisenberg, Spinrad, Eggum, 2010).

An adolescent can acquire more sophisticated cognitive strategies for regulating responses to emotional and social stimuli compared to a child (Kadosh, Linden, & Lau, 2013) yet adolescence is a period of brain development which still has remarkable plasticity. Students need ways to cope with stress and improve lifestyle habits, and the skills and lifestyle changes that they learn must be transferrable to and efficacious in their environments. Effective prevention strategies for adolescent students that promote self-regulation can potentially avert maladaptive patterns. Thus, prevention and intervention strategies that have a positive impact on emotional regulation, self-awareness, and stress reduction represent potentially viable solutions for the prevention of the development of psychological disorders in adolescents. One strategy that appears to promote these important developmental tasks is mindfulness.

Mindfulness

Mindfulness has many definitions. One definition often cited is from John Kabat-Zinn, founder of Mindfulness-Based Stress Reduction (MBSR) (Kabat-Zinn, 1990), who defined mindfulness as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994, p.4). In line with this definition, Shapiro, Carlson, Astin and Freedman (2006) theorized that the fundamental building blocks of mindfulness are intention (why one is practicing in the first place), attention (observing moment to moment, internal and external experience), and attitude (how one attends to experiences without evaluation or interpretation, and with an acceptance, kindness, and openness). Mindfulness is the state of

intentional awareness. In contrast, the effort to cultivate the ability to be mindful is called “practice” or “meditation practice” (Kabat-Zinn, 1994, p.9). Mindful meditation is about “stopping and being present” which can be distinguished from other types of meditation that have different purposes (Kabat-Zinn, 1994, p.11).

Mindfulness works to increase self-regulation of attention so that it can be focused on immediate experience, thereby allowing for increased recognition of events in the present moment (Bishop et al., 2004). Sustained attention on the current experience allows for thoughts, feelings, and sensations to be detected in the stream of consciousness. Practicing mindfulness through mindful meditation also strengthens the capacity to self-regulate attention by developing attentional control through intentional and repeated focusing, sustaining, and shifting of attention. Skills in switching attention allow one to bring attention back to the current experience once a thought, feeling, or sensation has been acknowledged. An orientation towards experiences in the present moment that is characterized by curiosity, openness, and acceptance is also adopted.

The practice of mindful awareness allows individuals to relate to their internal and external experiences in ways that are present-centered, objective, and responsive rather than ways that focus on the past or future, are subjective, or reactive (Meiklejohn et al., 2012). “In a state of mindfulness, thoughts and feelings are observed as events of the mind, without over-identifying with them and without reacting to them in an automatic, habitual pattern of reactivity” (Bishop et al., 2004, p. 232). This “space” in between one’s perception and response enables individuals to respond to situations more reflectively instead of reflexively. This state of mindfulness can interrupt automatic maladaptive habits and increase the ability to self-regulate in ways that foster health and well-being (Brown & Ryan, 2003). Shapiro and colleagues (2006)

proposed a model that suggests that intentionally attending with openness leads to shift in perspective that increases the capacity to dispassionately observe the contents of one's consciousness, a concept termed *reperceiving*. Reperceiving allows for additional mechanisms that can contribute to positive outcomes including increased self-regulation, values clarification, cognitive, emotional, and behavioral flexibility, and exposure to negative emotional states (Shapiro et al., 2006).

MBSR (Kabat-Zinn, 1990) was originally conceived as a method to improve public health as a solution to the over stimulated and rapid pace of life in the digital age that leaves individuals increasingly out of touch with their sense of well-being (Kabat-Zinn, 2005). MBSR was developed to reduce stress for people experiencing a range of medical problems. It is typically implemented within a university based medical center utilizing weekly two-hour group meetings with 45-minute daily home practice and a day of mindfulness over eight weeks (Kabat-Zinn, 1990). Mindfulness is practiced formally in sitting meditations, by simple yoga movements, and in the body scan. Studies of participants who receive MBSR have demonstrated that certain regions of the brain respond to mindfulness meditation training by reorganizing their structure to a degree which was related to degree of improvement on the *Perceived Stress Scale* (Hölzel et al., 2010). Since its initial implementation in 1979, hospitals, medical centers, and clinics have implemented over 720 mindfulness based programs modeled after MBSR and thousands have people have participated worldwide (Kabat-Zinn, 2013). MBSR has a wide range of empirical evidence for treating adult disorders (e.g. cancer, depression, anxiety, MS, chronic pain, fibromyalgia, disordered eating, PTSD) (Cullen, 2011). However, the efficacy of MBSR for youth is still developing.

Mindfulness-based Interventions for Youth

Adolescence has been discussed as a good time for learning mindfulness due to the increased ability to think abstractly, as well as the exploration of sense of self across various roles and relationships that is emerging, along with increased independence (Zack, Saekow, Kelly, & Radke, 2014). By grounding mindfulness practices in concrete exercises, such as yoga, eating, and walking meditations, the practice of mindfulness can become practical and accessible to adolescents through experience (Zack, Saekow, Kelly, & Radke, 2014).

Many of the more recent generation of cognitive behavioral therapies have also included mindfulness based practices, including mindfulness based cognitive therapy (MBCT), acceptance and commitment therapy (ACT), and dialectical behavioral therapy (DBT). Each model differs in the stated purpose: MBSR to enhance psychological wellbeing (Cullen, 2011), MBCT to prevent relapse of depression through changing cognitive patterns (Segal, Williams, & Teasdale, 2012), ACT to increase psychological flexibility to enhance ability to act toward values (Hayes, Luoma, Bond, Masuda, & Lillis, 2006); and DBT to enhance emotional regulation, behavioral self-control, and distress tolerance (Linehan, 1993). Mindfulness-based approaches are different from traditional cognitive based therapy approaches because they emphasize understanding and altering the functionality of thoughts and emotions as opposed to changing their content (Hayes and Greco, 2008).

Evidence for ACT with Adolescents

ACT is a cognitive behavioral therapy that targets flexibility in response to thoughts, feelings, and sensations through processes of mindfulness, acceptance, and behavior change (Swain, Hancock, Dixon, & Bowman, 2015). In ACT, mindfulness is used to reduce problematic past focused or future oriented attentional patterns to reduce rumination and catastrophizing. Mindfulness practices in ACT can range from formal meditation to more

informal practices of deliberately averting autopilot. ACT has a growing evidence base with adults; however, interest in use of ACT with youth and adolescents has also been mounting. Swain, Hancock, Dixon, and Bowman (2015) reviewed 20 ACT studies with broad inclusion criteria and found that the best evidence for ACT with youth exists for the treatment of tic disorders, depressive symptoms, and high risk sexual behavior. All the studies reviewed by Swain and colleagues (2015) included clinical populations or those referred for high risk behaviors. Only one study in the review compared ACT to another active treatment. Franklin and colleagues (2011) evaluated habit reversal training alone compared to habit reversal training plus ACT with youth with Tourette's Syndrome and found that both groups experienced reductions in tics with no significant difference between the groups, gains that were maintained at a one month follow up.

Livheim and colleagues (2014) examined effects of ACT with adolescents with depressive symptoms and stress symptoms. This study was reportedly underpowered due to a lower number of participants than anticipated though found a large significant improvement in perceived stress and a marginally significant change in mindfulness for those in the ACT treatment compared to those assigned to counseling with a nurse. No significant differences were observed in self-reported quality of life, depression, anxiety, general mental health, or avoidance and fusion. Overall, ACT has growing evidence with youth and has been found to decrease stress as well as promote other positive aspects of development in clinical populations; however, its use with non-clinical populations has not been studied.

Evidence of DBT with Adolescents

DBT is a comprehensive cognitive behavioral treatment developed for chronically suicidal patients (Dimeff & Linehan, 2001) and is now the leading evidence based treatment for

adult women with borderline personality disorder (Groves, Backer, van den Bosch, & Miller, 2012). DBT combines behavioral therapy with mindfulness practices, residing within an overarching dialectical worldview that emphasizes the synthesis of opposites (Dimeff & Linehan, 2001). Groves and colleagues (2012) reviewed a total of 12 outcome studies of DBT with adolescents, though none of the twelve studies included non-clinical participants. Findings demonstrated support for DBT as a promising treatment for adolescents with BPD symptoms, comorbid depression and suicidal ideation, bipolar disorder, eating disorders, and adolescents with aggressive and impulsive behavior (Groves, Backer, van den Bosch, & Miller, 2012). The use of DBT strategies with non-clinical populations is not well researched. Thus, the application of its use of mindfulness with non-clinical youth is unknown.

Evidence for MBSR and MBCT with Adolescents.

MBSR and MBCT include formal mindfulness practices as their core curriculum and thus are often included together in reviews. A feature of MBSR and MBCT is that authors insist that teachers have significant experience with mindfulness practice themselves before implementing the curriculums (Burke, 2010). MBCT often includes additional psychoeducation and exercises specific to depression compared to MBSR, although both programs are adaptable to characteristics of participants.

In a preliminary review of mindfulness based programs with children and adolescents, Burke (2010) systematically searched studies of mindfulness interventions for youth including MBSR, MBCT, and general mindfulness-based group approaches. Burke (2010) excluded ACT and DBT in the search due to reported differences in methodology of teaching mindfulness skills. Eight studies of the studies included high school age participants and only two of those used non-clinical populations (Burke, 2010).

The one study focusing on adolescents reviewed by Burke (2010) which used a non-clinical sample reported the feasibility of a modified MBSR intervention combined with Tai Chi implemented one hour a week for five weeks in school with middle school students aged 11-13 years (Wall, 2005). The students self-reported feeling calmer after sessions, although the researcher did not include formal outcome measures evaluating effectiveness. The students rated the acceptability of the intervention as positive and the author reported the intervention as feasible to be implemented in schools suggested collaboration of an instructor trained in Tai Chi combined with a facilitator of mindfulness as worthy of further investigation. The author also recommended other forms of gentle movement combined with MBSR content, including yoga in future studies (Wall, 2005).

According to Burke's (2010) systematic literature review, no studies existed that evaluated the effects of mindfulness-based intervention on adolescents from a non-clinical population that included outcome measures. However, several studies included promising results that MBSR based groups are feasible and socially acceptable with adolescents and may potentially decrease anxiety, enhance social skills, and improve academics. Burke (2010) indicated that research needs to shift away from feasibility towards large, well designed studies with robust methodologies and standardized formats that allow for replication and comparison studies to develop firmer evidence base.

Harnett & Dawe (2012) published a review of 24 studies published since Burke's (2010) review targeting children and adolescents conducted in clinical and educational settings. All the studies in clinical settings focused on clinical populations. Of the 13 studies in educational settings, seven included youth as opposed to teachers as the target population. Four of those included adolescent samples from middle or high schools. Only one of those used an active

control/comparison treatment as opposed to a waitlist or a non-treatment control. Gregoski and colleagues (2011) implemented a school-based mindfulness treatment based on MBSR with fifteen-year-old African American adolescents at risk for cardiovascular disease compared to a health education and *LifeSkills* Training control group. The treatment group showed a greater improvement in systolic blood pressure and a greater reduction in diastolic blood pressure; however, no change in self-reported perceived stress was found.

Semple, Lee, Rosa, & Miller (2010) implemented a school-based randomized controlled trial of 18 hours of MBCT for children aged 9-13 who were struggling academically compared to a waitlist control group. Results found decreases in attention and behavior problems from baseline to end of treatment but no significant group differences. Schonert-Reichl and Lawlor (2010) used a quasi-experimental pretest and posttest waitlist control group design to evaluate an intervention using mindfulness, self-regulation, goal setting, and learned optimism with 4-7th grade students (mean age 11.4 years) in their classrooms and found increases self-reported optimism and positive affect for across participants and increases in general self-concept in pre-adolescents. Broderick & Metz (2009) implemented *Learning to BREATHE*, a program based on MBSR, in six 30-minute sessions with all students of a Catholic female senior high class (average age 17.4 years) and found significant decreases in negative affect and significant increases in feeling calm/relaxed, however no change in emotional regulation, rumination, or somatization compared to a control group of junior high students who received class as usual.

Since Burke (2010) and Harnet & Dawe's (2012) reviews, the first randomized controlled trial of the efficacy of a group mindfulness program aimed at reducing and preventing depression in an adolescent school based population was conducted in Belgium (Raes, Griffith, Van der Gucht, & Williams, 2014). Twenty-four classes of students in 9th through 12th grades (ages 14-

17 years) were randomly assigned to intervention or control (business as usual) conditions. The intervention was a mindfulness group training specifically developed for adolescents (Dewulf, 2009; 2013) which integrated elements of MBCT and MBSR. It was delivered in eight weekly 100-minute sessions and homework including 15 minutes of mindfulness practice each day. Hierarchical linear modeling showed that the mindfulness intervention showed significantly greater reductions in depression compared with the control group at six month follow up. Whereas the mindfulness group and control group did not differ in terms of the levels of depression at baseline, the mindfulness group had lower levels of depression at both posttest and six month follow up than the control condition. Although this study provided evidence in support of the efficacy of a mindfulness-based approach for reducing depression symptoms in adolescents, relationships with other functional outcomes were not assessed (Raes, Griffith, Van der Gucht, & Williams, 2014).

Systematic Reviews of Mindfulness in Schools

Considering that mindfulness research has often been described as in its infancy, the study of mindfulness with youth in schools is in its pre-natal stage (Felver & Jennings, 2016). A recent search of the PsychInfo database using “mindfulness” as a keyword found over three thousand scientific articles (n=3,350) have been published on the topic. However, only 8% of those (n=256) have involved youth under the age of 18 and only 1% (n=36) have focused on its use in school settings (Felver & Jennings, 2016).

Two systematic reviews of school-based mindful based interventions have been recently published (Zenner, Herrnleben-Kurz, & Walach, 2014; Felver, Celis-de Hoyos, Tezanos, & Singh, 2016). Zenner and colleagues (2014) systematically searched twelve databases and found twenty-four studies to include in their meta-analysis that met the criteria (i.e. based on the

concept of mindfulness with classical mindfulness practices such as mindful breathing or body scan as core elements) and were implemented in schools with students from grade 1-12 and included quantitative outcome data. Eight studies implemented mindfulness intervention at the elementary school level, two studies occurred at the middle school level, and fourteen studies were conducted at the high school level. Five of the studies at the high school level were randomized controlled trials. None of those included an active control and all included randomization to a mindfulness group or a waitlist control group. Three occurred in Spain and two occurred in the United States.

Franco Justo (2009, 2011a, 2011b) conducted the three studies in Spain. The first study evaluated the effects of school based mindfulness program on verbal creative levels of adolescents aged 15-18 and found improvement compared to waitlist control group in the areas of fluency, flexibility, and originality. Franco Justo (2011a) then found significant improvement on grades, self-concept, and state and trait anxiety using a school based mindfulness program with high school students aged 16-18. Franco Justo (2011b) found significant improvements in task approach and coping, self-concept and self-esteem, and empathy and social relations using a school based mindfulness intervention compared to the waitlist control group. Mai (2010), an unpublished doctoral dissertation, implemented a mindfulness intervention with 9th grade students at a low socioeconomic urban high school and found no significant differences in emotion regulation (measured by the *Difficulties in Emotion Regulation Scale*), grades, or school attendance compared to the waitlist control group. Potek (2012) implemented a school based mindfulness intervention with high school students, ages 14-17, and found significant decreases in anxiety (measured by the *Multi-Dimensional Anxiety Scale for Children*) compared to a waitlist control group though found no significant effects on emotional regulation (measured by

the *Difficulties in Emotion Regulation Scale*) or stress scores (measured by the *Perceived Stress Scale*) of adolescents compared to controls.

Overall, one third of the studies in the Zenner Herrleben-Kurz, & Walach (2014) review provided some information about acceptability of the intervention and overall acceptability was high when it was reported. Several studies provided information regarding feasibility; however, very few reported data on implementation integrity. The studies that used pre-post designs to evaluate within groups yielded a small to medium weighted mean effect size $g = 0.41$ (95 CI 0.28-0.54). Weighted mean effect size of the 19 studies that used a randomized, controlled design to evaluate between groups was $g = .40$ (95% CI 0.21, 0.58), indicating a small to medium effect; however, there was significant amount of heterogeneity between studies in the findings. The largest effect size was found in the domain of cognitive/attention performance $g = .80$. Effect sizes were smaller but still significant for stress $g = .39$, and resilience $g = .36$ (all $p < .05$). Changes in self-report of emotional problems (e.g. depression, anxiety) ($g = 0.19$) and third person ratings ($g = .25$) were small and nonsignificant (Zenner, Herrleben-Kurz, & Walach, 2014). Overall, this review of mindfulness-based interventions conducted in schools on a variety of research targets have shown overall small to moderate effect sizes although inconsistent and/or inconclusive results have been found, often due to methodological problems (e.g., inadequate samples sizes and/or lack of control groups) (Zenner, Herrleben-Kurz, & Walach, 2014).

Felver, Celis-de Hoyos, Tezanos, & Singh (2016) reviewed twenty-eight studies that used mindfulness as the primary intervention component (excluding DBT and ACT) delivered in a school context. The studies were coded based on the study characteristics including research design, control conditions, sample size, and setting. Findings indicated many studies used large

sample sizes, however only a third of the research studies used an experimental design. Only a few studies included an active control condition (n=3) or a semi-active control (n=3) although it was unclear from Felver and colleagues' (2016) review which studies these were. Most studies that made a comparison used treatment as usual as the comparison condition. Student characteristics like gender, age, grade, race/ethnicity, disability status, socio-economic status as well as other student level variables were also analyzed. Findings indicated that studies have been conducted across a balanced range of ages and grade levels and many studies include students with diverse ethnic-racial backgrounds. However, there is a lack of reporting of other student demographics, particularly disability and socioeconomic status. Intervention characteristics were also considered, including the description of the intervention, replication, intervention timing and duration, and format of the intervention. Results of the literature review found there are varied types of studies regarding dosage with the duration of the MBI used ranging from 75 to 2160 minutes (mean 396.7, SD = 412.5) and the average length of a session ranging from 5 to 120 minutes (mean ,36.8, SD = 26.9). The total number of sessions ranged from 4 to 60 (mean 17.5, SD = 17.9) spanning between 2 and 24 weeks (mean = 8.2, SD=4.6). Many studies used MBSR elements and most studies were delivered by a teacher or outside facilitator in a group intervention format conducted in a classroom during the school day. Measurement type, intervention outcomes, and follow up date were reported as outcome characteristics that were coded. Most studies included a single informant; typically, the student self-report, with no school collected data (e.g. grades) in any of the studies. Few studies collected post intervention follow up data and few studies used a multi-method, multi-informant approach to data collection. Recommendations for future studies included research designs that include experimental, randomized controlled trials, active control conditions that include both

didactic and experiential components, and to statistically account for the effect of students being nested within classrooms and schools. It was recommended that existing interventions be replicated as opposed to composing new MBI's. Collecting follow-up data was also recommended for future studies evaluating mindfulness (Felver, Celis-de Hoyos, Tezanos, & Singh, 2016).

Learning to BREATHE (L2B)

L2B is a mindfulness curriculum for adolescents to facilitate the development of emotion-regulation and stress-management skills in late childhood and adolescence (Broderick, 2013). According to the manual (Broderick, 2013), emotion regulation is promoted by facilitating awareness of sensations, thoughts, and emotions; encouraging decentering from thoughts and feelings in ways that allow for simple observation and less experiential avoidance; learning to defuse the intensity of emotions and the subsequent drive to act of them automatically; and reducing negative rumination, all which have been shown to be a risk factors for the development and maintenance of depression (Broderick & Korteland, 2004; Morrow & Nolen-Hoeksema, 1990).

Several studies have evaluated the effects of *L2B* with adolescents with promising results. The most recent study occurred at an alternative high school in North Carolina for students for high risk adolescents who have had behavioral difficulties at their traditional public high school (Bluth, Campo, Pruteanu-Malinici, Reams, Mullarkey, & Broderick, 2016). Twenty-seven students were randomly assigned to a mindfulness or substance abuse control class that occurred once per week for 50 minutes over one school semester. The student's average age was 17 years and most of the students were in the 10th or 11th grade. Fifty-seven percent of the students were Hispanic and 39% were female. An adapted version of *L2B* was used to accommodate the

logistical demands of the school and the needs of the population. The instructor had been a mindfulness instructor for 3 years, a classroom teacher for 18 years, and had taught *L2B* in several different school and community settings. Fourteen treatment sessions were scheduled; however, only 11 were implemented due to extreme weather and a scheduled guest speaker. Eighty-one percent of students attended eight or more of the eleven classes. Students in the mindfulness class reported a significant reduction in depressive symptoms as measured by the *Short Mood and Feelings Questionnaire (SMFQ)* compared to those in the control group whose scores regarding depressive symptoms increased (Hedge's $g = -1.26$; 95% CI: $-2.21, -.30$). Results did not indicate significant differences between the treatment and control group for outcomes related to self-reported social connectedness (as measured by the *Social Connectedness Scale*), anxiety (as measured by the *Spielberger State-Trait Anxiety Inventory*), mindfulness (as measured by the *Child and Adolescent Mindfulness Measure*) or perceived stress (as measured by the 10 item *Perceived Stress Scale*) in the treatment group, though small to moderate effect sizes were reported. Acceptability was also evaluated and it was found that initially the substance abuse class had higher ratings of perceived credibility as initially the adolescents appeared apathetic toward the concept of mindfulness and there were some behavioral problems during the program implementation. However, over the semester the credibility of the mindfulness class increased while that of the substance abuse class decreased. Qualitative measures indicated that mindfulness helped to relieve stress and that the students generally would like to continue the class. The authors recommended establishing a safe place where students feel comfortable and have positive associations, as well as integrating school personnel with which the students already feel comfortable whenever possible, and having non-school instructors spend time with the students outside of the program (e.g. at lunch, afterschool

activities) may lead to increased acceptability of the program with the adolescents. The authors called for additional research to expand upon these findings with other ethnically diverse and at-risk populations (Bluth et al., 2016).

Another study evaluated the effects of *L2B* on the emotional regulation of students in a public high school with a 99% graduation rate and a 90% White, middle to high income population using a quasi-experimental pretest-posttest comparison group design (Metz et al., 2013). Students in grades 10-12 participated in the study. In the treatment group, 34.9% of participants were male versus 33.3% in the comparison group. Students in the treatment condition (n=129) received 15-25 minutes of *L2B* in 18 sessions, approximately once per week, over 16 weeks. Students in the control condition (n = 87) participated in concert choir class as usual. The design did not involve randomization. Students who received the *L2B* program reported statically lower levels of perceived stress (measured by a single item asking participants to circle how stressed they have been feeling in the past week on a 1-10 scale) and psychosomatic complaints (measured by the *Psychosomatic Complaints Scale*) and statistically higher levels of efficacy in affective regulation (measured by the *Affective Self-Regulatory Efficacy Scale*) and emotional regulation skills including emotional awareness, access to regulation strategies, and emotional clarity (measured by the *Difficulties in Emotion Regulation Scale*). The study did not find significant effects on impulse control difficulties, however the authors reported that the study was underpowered to detect small effect sizes ($d = .10$), and perhaps adolescents are not good reporters of their own impulse control difficulties or there was not an effect on impulse control difficulties. The authors called for more research to shed additional light on the program's effect with a more diverse array of respondents and measurement methods (Metz et al., 2013).

A pilot study of *L2B* at a private Catholic school for girls used a non-randomized pretest/posttest control group design (Broderick & Metz, 2009). The entire senior class (n=120) participated in the mindfulness program and the control group was the junior class who received school as usual. Most participants were Caucasian in both the treatment group (93.3%) and the control (88.2%). The average age was 17.43 years old in the treatment group and 16.41 years old in the control group. Mean gain scores in a pretest to posttest comparison were evaluated between groups to assess program effectiveness. In comparison to the control group, the program participants evidenced a significant reduction in negative affect and a significant increase in feeling calm/relaxed/self-accepting as measured by self-report on the *Positive and Negative Affect Schedule (PANAS)*. The program evaluation indicated that 86.5% of participants were satisfied or very satisfied with the *L2B* program. In class program activities rated most useful were in class meditation practice, body scan meditation, and a music and emotions activity, while in class discussion was rated as the least useful activity. About half of the participants indicated the most important skill they had learned from the program was how to better deal with stressful thoughts and feelings. Broderick & Metz (2009) reported the results as promising, though indicated that the homogeneity of the sample limits the generalizability to other populations so the program's efficacy with more diverse populations (e.g. gender, ethnicity, social class) and its use with younger groups of adolescents should be explored. The authors also suggested follow up in future studies to describe if effects persist beyond program completion.

The *L2B* program has demonstrated some promising initial findings with non-clinical populations of adolescents in school settings, most notably success has been found with improving affective regulation, decreasing stress and psychosomatic complaints with middle to

high socioeconomic mostly Caucasian and largely female populations. One study did note reduction in depressive symptoms for students attending an alternative high school, however research with diverse populations and active control groups is lacking. More research has been recommended to explore effects of *L2B* with more ethnically diverse populations, groups of younger adolescents, and using additional forms of measurement.

Yoga as an Intervention for Youth

Yoga has become increasingly popular in America and is now considered as a complementary and alternative modality (CAMM) for psychological and health related problems. Yoga, developed thousands of years ago, is now considered a form a mind-body medicine, and while there are many forms, each typically includes a combination of breathing practices (pranayama), physical postures (asanas), and meditation (spirituality) (Galantino, Galbavy, & Quinn, 2008). White (2009) described that based on the review of relevant literature, when youth participate in yoga (frequency of practice is ideally four to six times a week and at least once a week) the parts of each yoga class include quieting of the mind, postures and breathing, relaxation, and a readjustment time to bring the mind and body back to normal. The length of the practice should vary based on the developmental level of the child, from 15 minutes for younger children, 25 minutes for children ages 7-9 years old, and longer lengths when the attention span and developmental level is increased (White, 2009). Benefits of yoga have been found to range from decreasing anxiety (Kuttner et al., 2006), improving strength, flexibility, and functioning of the parasympathetic nervous system (Parshad, 2004) to increasing attention and emotional control (Jensen & Kenny, 2004).

Galantino and colleagues (2008) reported that yoga shows promise as a new modality for the pediatric population after they completed a systematic review of the literature on the

therapeutic effects of yoga for children. These researchers reviewed 24 studies and found that there is evidence to suggest that yoga improves cardiovascular functioning including motor performance, concentration, and academic learning. Studies reviewed indicated yoga improves concentration (Hopkins & Hopkins, 1979), attention and emotional control (Jenson & Kenny, 2004), and spatial and verbal memory (Manjunath & Telles, 2004). Yoga has also been found to increase neurotransmitter function (GABA levels) that affect mood (Streeter et al., 2007) and reduce of emotional lability in children with emotional difficulties (Rauhala, Alho, Hanninen, & Heilin, 1990; Telles & Naveen, 1997). Also, use of various forms of relaxation techniques including yoga, progressive muscle relaxation, biofeedback, and mental relaxation have been found to reduce symptoms of inattentiveness, hyperactivity, and impulsiveness and improve ability to relax and learn in handicapped children (Zipkin, 1985).

Improvements in cardiopulmonary functioning has also been demonstrated by reduced hypertension, heart, and respiratory rates after yoga practice (Chaudhary, Bhatnagar, Bhatnagar, & Chaudry, 1988) and yoga has been found to play a role in the management of chronic illness (Kuttner et al. 2006). A study by Parshad (2004) found that the relaxation induced from yoga helps to stabilize the parasympathetic nervous system, increase muscle strength, flexibility, oxygen uptake, and hormone function (Parshad, 2004). This review lacked inclusion of details of setting and participant demographics for most of the studies; however, provided some evidence for the positive effects of yoga on attentional, behavioral, and cognitive development in youth. Most of the studies reviewed were conducted in India and authors asserted as yoga is researched in western cultures and appropriate use and full description will be required to properly study the full magnitude and variability of response of yoga in children and adolescents (Galantino, Galbavy, & Quinn, 2008).

Jensen and Kenny (2004) found that there were benefits of yoga as a complementary treatment for eleven boys ages eight to twelve years, the majority of whom were already stabilized on medication for ADHD. In this study, twenty, one-hour, weekly yoga group sessions took place at a hospital in Australia and parents were encouraged to assist with daily practice sessions at home. The yoga techniques used included respiratory training, postural training, relaxation training, and concentration training. A randomized crossover design was used and the control group participated in cooperatives games and activities instead of yoga. Significant improvements with medium to large effect sizes were found pretest to posttest on the *Conners Parent Rating Scales-Revised: Oppositional Index, Global Index Emotional Lability, Global Index Total, and Global Index restless/Impulsive* and a small effect was found for the ADHD Index. The results showed no differences reported by teachers on the Teacher rating scales for the same indexes, which authors attributed to the medication effects being present during the school day and wearing off at night, so the effects of the yoga intervention were more susceptible to night time. The authors reported that had the study had greater power, small effects may have been found in the teacher's ratings for improvements observed during the school day (Jensen & Kenney, 2004).

Frank, Bose, and Schrobenhauser-Clonan (2014) studied the effectiveness of a school based yoga program on adolescent's mental health, stress, coping strategies, and attitudes toward violence. Participants included an ethnically diverse sample of students attending an alternative school for at-risk youth in grades 9-12. A quasi-experimental pretest-posttest design was used. The *Transformative Life Skills (TLS) program* (Frank et al., 2012) is a universal classroom based program that provides students with sequenced instruction and applied experience using yoga postures, breathing techniques, and centering meditation. *TLS* lessons were taught by certified

yoga teachers who had training specific to *TLS*. Lessons were integrated into first period homeroom classes 3-4 days per week over one school semester. No statistically significant pretest to posttest differences were found on measures of positive affect, negative affect, or somatization. Significant and meaningful improvements were found on measures of student anxiety, depression, and global symptoms. Emotional regulation indicators including involuntary engagement, involuntary action, rumination, intrusive thoughts, physical arousal, and emotional arousal were also found to significantly improve from pretest to posttest. Reductions in propensity for interpersonal violence and reductions in revenge motivation were also found. While this study provides some evidence of the use of yoga to build social emotional competencies with at-risk adolescents in a school setting, the authors recommended conducting future designs using a control group to provide more evidence of causality (Frank, Bose, and Schrobenauser-Clonan, 2014).

Yoga has been shown to enhance a variety of physical and mental health aspects of youth's development, including academics (Galantino, Galbavy, & Quinn, 2008; Bergen-Cico, Razza, Timmins, 2015; Fishbein et al., 2016; Frank, Bose, and Schrobenauser-Clonan, 2014). It appears that yoga is a potentially viable form of complementary treatment to improve a variety of cognitive, emotional, and behavioral processes. However, the research in this area has generally lacked in its ability to evaluate yoga as a treatment approach using a sound methodology and inconsistent findings exist. More research is needed to further understand the effects of yoga as a complementary method of preventing negative psychological symptoms as well as well as promoting positive outcomes in adolescents.

Mindfulness and Yoga as an Enhanced Health and Physical Education Curriculum

Napoli, Krech, and Holley (2005) recommended the health curriculum as an ideal place for implementing a mindfulness program during the school day. Napoli and colleagues (2005) discussed that although mindfulness activities can benefit the core academic classrooms (i.e. language arts, math, science, social studies), teachers of those classes have a great deal of required curriculum to cover in an academic year leaving less flexibility and time to implement the activities. The purpose of a mindfulness based intervention falls under the content of a health course as it is designed to reduce stress and promote social emotional learning. Additionally, all students are required to take physical education and training the physical education staff may be more cost efficient than training all teachers in a school. For these reasons, it has been recommended to implement mindfulness training during the school day as a part of a health course (Edwards, Adams, Waldo, Hadfield, & Biegel, 2014).

Yoga fits nicely within the physical education curriculum as it includes movement and aligns with many of the goals of physical education including increasing body awareness, strength, and flexibility. Jensen and Kenney (2004) reported that their study of the effects of yoga may have been improved if conducted at a school to ensure more consistency in amount of sessions attended in the intervention group. Few studies exist that evaluate the effectiveness of yoga implemented with adolescents as a part of a physical education curriculum and as a compliment to another program designed to promote health and wellness.

Summary

As many as one in five adolescents experience distress due to a psychological disorder and many disorders have comorbidities that complicate treatment (Merikangas al., 2010). When youth are overwhelmed by negative psychological stressors, they are at increased risk for developing psychological disorders (Edwards, Adams, Waldo, Hadfield, & Biegel, 2014).

School based universal prevention can be implemented with an entire school community to develop skills for healthy social and emotional functioning and protect against psychosocial difficulties (Dwyer & Van Buren, 2010). Much of the effectiveness of universal prevention has been evaluated in early childhood or elementary schools (Cook et al., 2015; Schindler et al., 2015) with less attention paid to development of needed skills during adolescence. Therefore, more information regarding effective universal and primary prevention programs is needed to promote positive psychological and functional outcomes for adolescents in schools (Greenberg, Domitrovich, & Bumbarger, 2001).

Mindfulness targets multiple influences on self-regulation including providing training in re-perceiving which exercises attention and awareness while simultaneously reducing stress (Zelazo & Lyons, 2011). Many research studies exist evaluating the effects of mindfulness programs used with different clinical populations, however few well designed research studies using active controls have been conducted to show if mindfulness might be an effective protective and preventative method against the development of psychological disorders for non-clinical populations of high school students (Davidson & Kaszniak, 2015) despite calls for these types of studies (Davidson et al., 2012; Burke, 2010; Zelazo & Lyons, 2011). Yoga has been shown to be an effective complementary treatment to promote many positive outcomes including increased emotional regulation, attention and concentration, flexibility and strength, as well as cardiovascular functioning. Relatively little is known about the effects of mindfulness-based intervention and yoga implemented with adolescents in school settings, especially regarding dosage and specific outcomes impacted compared to alternate health and PE curriculums. Additional research is warranted to assess the efficacy of mindfulness-based training combined with yoga for adolescents in a school context.

Current Study

The primary aims of this study are to investigate the feasibility, acceptability, and efficacy of mindfulness and yoga as an enhanced curriculum for high school students. This study specifically evaluates the implementation of a mindfulness and yoga enhanced PE curriculum to decrease stress and enhance mechanisms of mindfulness as well as the developmentally required skill of emotional self-regulation as well as evaluate its effects on other psychological outcomes.

The current study describes the effects of a mindfulness and yoga enhanced health and PE curriculum compared to an active control Health and PE curriculum that includes stress psychoeducation, coping skills, and yoga on the emotional self-regulation and psychological health of students. The intervention included twelve 60-minute sessions across six weeks. The mindfulness intervention was implemented twice per week during Health and PE class that meets five times per week. The mindfulness curriculum used is *Learning to BREATHE* (Broderick, 2013) which is drawn from foundational components of MBSR (Kabat-Zinn, 1990) and elements of ACT (Hayes et al., 2006), MBCT (Segal et al., 2012), and DBT (Linehan, 1993) combined with yoga practice.

The following research questions will be addressed with the study:

1. What is the feasibility of implementing a mindfulness and yoga intervention as an enhanced PE and Health curriculum in a high school setting? What were the difficulties and successes encountered during implementation? Is the program implemented with more or less fidelity compared to an active control stress psychoeducation and coping skill with yoga enhanced Health and PE curriculum?

2. What is the acceptability of the enhanced Health and PE curriculums according to students, teachers, and administrators? Is the mindfulness program more or less acceptable than the alternate coping skills enhanced Health and PE curriculum?
3. How efficacious is mindfulness intervention in enhancing psychological outcomes (e.g. increasing emotional regulation and decreasing stress as well as symptoms of anxiety and depression) of high school students compared to an active control health and PE program?
4. How efficacious is the mindfulness intervention at enhancing academic self-efficacy and decreasing disruptive behavior of high school students compared to an active control health and PE program?
5. How does the mindfulness treatment affect the development of various mechanisms underlying the impact of mindfulness (i.e. nonjudgmental response, present moment awareness, fusion, experiential avoidance)?
6. How does the mindfulness treatment affect stress and emotional regulation over time in the treatment group?

The following are the corresponding hypotheses for the study:

1. There will be no difference in the feasibility of the two programs, as evidenced that the treatment fidelity data will not be statistically different between the two conditions.
2. There will be no difference in the acceptability of the two programs, as measured by the staff surveys and student evaluations data and open-ended feedback.
3. The mindfulness intervention will show increased effects on the psychological outcomes of the high school students compared to the active control condition.

4. The mindfulness intervention will show improved academic efficacy and decreased disruptive behavior of the high school students compared to the active control condition.
5. Participants in mindfulness intervention will show increases in the development of nonjudgmental response, present moment awareness and a steady decrease in fusion and experiential avoidance compared to the active control condition.
6. Participants in the mindfulness and control interventions will show a steady decrease in stress and difficulties with emotional regulation over the course of the interventions.

CHAPTER II: METHOD

Participants

Participants were recruited from five, ninth grade classes in a public high school in a rural area of a southeastern state. The school district consists of one high school, one middle school, and two elementary schools. The school district for this county is a Tier 1, low wealth, rural school system. The student population is 24.0% Hispanic, 40.7% African American, 30.2% Caucasian, and 1.4% multi-racial. Over 75% of the school district's students are economically disadvantaged.

Process of Consent. Prior to the beginning of the study, parents were sent a packet providing an explanation of the study and research method. Included in the notification sent out to parents, documentation explained, in parent-friendly language, the purpose of the intervention, broad goals of the study, broad components of the intervention and any potential risks associated with the intervention. Parents were informed that their child's participation in the study was not mandatory and participating or not participating will in no way affect their academic performance or relationship with PE teachers or study staff. Parents were given the explicit choice to consent for their child to participate or indicate if they did not wish for their child to participate in the research. The information sent to parents explained that their child would be participating in the enhanced curriculums as a part of the regular Health and PE curriculum of the school, however students whose parents do not provide consent for research will not complete any assessments. Instead, the students who do not participate in the research will be provided with alternate activities during the assessment periods but will participate in the curriculum along with all the other students in the class. Parents were also provided with contact information of the principal investigator and faculty supervisor. Parents were encouraged to reach out with any questions regarding the study procedures and their child's participation. If

consent forms were not returned, research staff attempted to follow up with the parents via phone calls.

Process of Assent. Students received similar documentation regarding the parameters of the study provided to them in class prior to the beginning of the study. Participation in the study was optional for students, and those who opted not to participate in the research did not complete assessments (but did take part in the enhanced curriculums). Each adolescent was asked to sign an assent form prior to participation.

Study Inclusion. Parent consent as well as student assent was obtained for 80 students enrolled across the five-high school Health and PE classes. All the students in the high school Health and PE classes who provided consent and assent were included in the study. Because the aims of the study included evaluation of a primary prevention program, no exclusionary criteria were applied. Approximately 125 students were approached with consent and assent forms, therefore approximately 66% of students in the health and PE classes were included in the study. Failure to return parent forms, parents denying consent, and students denying assent were all reasons that students did not participate in the research, however all students received the intervention that was provided to their class regardless of their inclusion in the research.

Basic Demographics. Three students did not complete the demographics form and some students omitted answers on forms; however, data that was collected and reported below. The mean age of participants in the study was 14.53 years ($SD = .66$). All students who responded reported they were between the ages of 14 and 16. Thirty-four students (44.2%) identified as male, 42 students (54.5%) identified as female, and one student (1.3%) identified as transgendered male. In terms of racial/ethnic demographics, 33 students (42.9%) identified as African American/Black, 19 students (24.7%) identified as Caucasian/ White, 20 students

(26.0%) identified as Hispanic/Latino, 2 students (2.6%) identified as American Indian/Native American, and 3 students (3.9%) identified as multi-racial. Sixty-two students (81.6%) reported English as their first language and 14 students reported English was not their first language (18.4%).

Family Demographics. Thirty-two students (41.6%) reported they live with their mother and father, 28 students (36.4%) reported their primary residence is with their mother, 6 students (7.8%) reported their primary residence is with their father, two students (2.6%) reported living part time with mother, part time with father, and 9 students (11.7%) reported other living arrangements (e.g. living with aunt/uncle, grandparents, or in foster care). Students were asked to report the highest educational attainment of either one of their parents and their eligibility for free and reduced lunch at school as proxy measures of socio-economic status. Twenty-two students (29.7%) reported neither of their parents completed high school, 21 students (28.4%) reported at least one parent was a high school graduate or equivalent (GED), 14 students (18.9%) reported at least one parent attended some college but had no degree, 1 student (1.4%) reported a parent received technical or vocational training, 4 students (5.4%) reported at least one parent has an associate's degree, 6 students (8.1%) reported at least one parent completed a bachelor's degree, 5 students (6.8%) students reported a parent with a master's degree. No students reported that either of their parents had doctoral degrees. Seventy students (90.9%) reported they were eligible for free or reduced lunch and seven (9.1%) students reported they were not eligible for free or reduced lunch.

Educational Demographics. Seven students (9.2%) reported they had an IEP and 69 (90.8%) students reported they do not have an IEP. Eighteen students (23.7%) reported they had repeated at least one grade and 58 students (76.3%) of students reported they had never repeated

a grade. Twenty-seven students (35.5%) reported they had been suspended from school at least once and 49 students (64.5%) reported they had never been suspended from school.

Treatment Groups

Classes in each condition were matched based on de-identified percentages of gender and race/ethnicity of each class so that each condition had approximately equal proportions of students based on those classifications in each condition. After the consent and assent process was completed, 49 students across the three classes scheduled to receive the *L2B* mindfulness intervention returned consent and assent forms; therefore, those students comprised the treatment group. Thirty-one students in classes that were set to receive the stress management and coping intervention returned consent and assent forms therefore those students comprised the in the active control group. Preliminary t-tests compared treatment and active control group pretest data. No significant differences were found between groups in pre-existing levels of anxiety, depression, mindfulness, avoidance/fusion, or stress on two tail Student's t-tests. There were also no significant pre-existing group differences in age, race, gender, English proficiency, parent education, free and reduced lunch, or number of students who had an IEP. See Table 1 for t-test results examining group differences of demographics and pre-test scores.

Table 1
Group Differences for Demographics and Pretest Scores

	<i>t</i>	df	<i>p</i>
Age	0.34	66	.73
Sex	0.30	56	.77
Race	0.16	57	.88
English First Language	-1.32	67	.19
Parent Education	0.28	66	.78
Free/Reduced Lunch	0.36	51	.72
IEP	-0.33	51	.74
<i>PSS</i>	-0.58	63	.56
<i>DEERS</i>	-0.72	60	.47
<i>CAMM</i>	0.20	54	.84
<i>AFQ-Y8</i>	-1.70	52	.09
<i>SCARED</i>	-1.18	60	.24
<i>CES-DC</i>	-0.21	55	.83
<i>PALS AE</i>	0.99	63	.32
<i>PALS DB</i>	-1.45	53	.15

p* < .05. *p* < .01.

Measures

Demographics and Background Information. Students were asked to complete a demographic and background information form which asked questions assessing demographic (age, gender, ethnicity, the highest educational level of either of their parents, living arrangements, if English is first language, and if they receive free/reduced lunch), academic (GPA from last school year, and if they have an IEP, if they are in any special programs, if they have been suspended from school), mental health (if they have past or current mental health conditions and whether have received any mental health services in the past or currently), and stress management practices (meditation, yoga, deep breathing) information.

Stress. The *Perceived Stress Scale (PSS)*; Cohen, Kamark, & Mermelstein, 1983) served as a measure of adolescent stress in this study. The *PSS* was initially developed as a brief 14-item self-report questionnaire assessing general perceived stress in an individual's life. The scale has since been shortened to 10-item and 4-item scales through several factor analytic and

validation studies (Cohen & Williamson, 1988). The 10-item *PSS* (i.e., *PSS-10*) was used for purposes of this study's pretest, posttest, and follow up because of its preferred psychometric properties. The *PSS-10* was also administered weekly to assess the changes in student stress over time. The *PSS-10* has demonstrated acceptable internal consistency reliability ($\alpha > .70$) across 12 studies and high test-retest reliability ($r > .70$) across four studies (Lee, 2012). The *PSS-10* has demonstrated criterion validity through a correlation with the Medical Outcomes Study—Short Form 36 (Ware, Snow, Kosinski, & Grandek, 1993). Construct validity has been demonstrated through moderate to strong correlations with a series of other related measures (Lee, 2012). The *PSS-10* asks participants to read questions about their thoughts and feelings during the last month. Specific questions are “In the last month, how often have you been upset because of something that happened unexpectedly?” and “In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?” Participants are asked to circle a rating of 0 (*never*) through 4 (*very often*) that best represents their answer to each of the 10 questions. The weekly administration of the *PSS-10* asked students about their thoughts and feelings over the past week. The *PSS-10* has mainly been validated with college students although its simple questions and ease of readability should lend itself for use with adolescents. The *PSS-10* has been used in a variety of studies of adolescent stress (Thaker & Verma, 2014; Lu et al., 2014; Mortier et al., 2015).

Emotion Regulation. The *Difficulties in Emotion Regulation Scale (DERS)* (Gratz & Roemer, 2004) served as a measure of adolescent emotional self-regulation. The *DERS* is a brief, self-report questionnaire designed to assess multiple aspects of emotion dysregulation. The Flesch-Kincaid Grade Level of the *DERS* is 5.3, indicating that the average fifth grader should be able to read and understand the items on the *DERS* (Neumann, van Lier, Gratz, &

Koot, 2010). The initial validation of the *DEERS* with college undergraduate students suggested high internal consistency ($\alpha = 0.93$), good test-retest reliability, and adequate construct and predictive validity (Gratz & Roemer, 2004). Confirmatory factor analysis with a community sample of adolescents (11-17 years) at schools in the Netherlands replicated the factor structure in the adolescent sample that was previously found with adults (Newmann et al., 2010). Internal consistency of the subscales was found to be acceptable to high in the adolescent community sample (average $\alpha = 0.81$) and analyses regarding concurrent validity found associations between the *DEERS* and both internalizing and externalizing problems. Strong factorial invariance indicated no gender bias in ratings of *DEERS* factors on three scales and limited gender bias on the other three scales. The scale lists 36 items related to emotional regulation and participants are asked to indicate how often statements apply to them. The response options are (1) Almost Never/(0-10%), (2) Sometimes/(11-35%), (3) About Half the Time/(36-65%), (4) Much of the Time/(66-90%) or (5) Almost Always/(91-100%). The *DEERS* yields a total score as well as scores of six scales derived through factor analyses. The six subscales are Nonacceptance of Emotional Responses (6 items), Difficulties Engaging in Goal Directed Behavior when Distressed (5 items), Impulse Control Difficulties when Distressed (6 items), Lack of Emotional Awareness (6 items), Limited Access to Emotion Regulation Strategies (8 items), and Lack of Emotional Clarity (5 items).

Mindfulness. Mindfulness mechanisms of nonjudgmental, nonavoidant responses to private moment awareness and present moment awareness were assessed using the *Child and Adolescent Mindfulness Measure (CAMM)*; Greco, Baer, & Smith, 2011). The *CAMM* is a brief (i.e., 10 items), narrowband scale measuring self-reported mindfulness skills in children and adolescents. The *CAMM* was initially validated within four studies focusing on item

development, exploratory factor analysis, confirmatory factor analysis, and convergent and incremental validity. Participants read statements such as “I get upset with myself for having feelings that don’t make sense” and were asked to select one of five possible responses ranging from *Never True (0)* to *Always True (5)* to describe how often each sentence is true for them. The *CAMM* has a high reliability ($\alpha = .81$) and possesses convergent validity with several other related measures (Greco et al., 2011). The *CAMM* has also been shown to possess high internal consistency ($\alpha = 0.80$) and convergent validity for adolescents in independent samples (de Bruin, Zijlstra, & Bögels, 2014).

The *Avoidance and Fusion Questionnaire for Youth (AFQ-Y)*; Greco, Lambert, & Baer, 2008) is a self-report 17 item inventory to assess psychological inflexibility related to cognitive fusion and experiential avoidance in youth ages 9-14 years. Cognitive fusion refers to entanglement with the content of private events. Instead of noticing thinking and feeling as an ongoing process, fusion involves and attachment to the content of private events and a response to the content as if it were literally true. Experiential avoidance is the unwillingness to experience certain private events and attempts to alter, avoid, or otherwise control their frequency, form or sensitivity. The *AFQ-Y* has demonstrated excellent internal consistency ($\alpha = 0.90$) and convergent validity (Greco et al., 2008). The *AFQ-Y* asks respondents to rate how true each item is for them, on a 5-point rating scale (0=*not at all true*; 4 = *very true*). An example of an item designed to measure cognitive fusion is “My thoughts and feelings mess up my life”. An example of an item designed to assess experiential avoidance is “I push away thoughts and feelings I don’t like”. A short version, eight item, form *AFQ-Y8* was developed and found to have good internal consistency ($\alpha = 0.83$). It was reported that the *AFQ-Y8* may be more appropriate for group-based research than for clinical evaluation of individuals due to the slightly

lower reliability and a person separation reliability of (.75). (Greco et al., 2008). The *AFQ-Y8* was used in this study.

Anxiety. The *Screen for Child Anxiety Related Emotional Disorders (SCARED;* Birmaher et al., 1997; 1999) served as a screening measure of anxiety. The *SCARED* is a self-report instrument that was developed as a screening tool to assess anxiety symptoms in youth between the ages of 9 and 18. The *SCARED* was initially developed as a 38-item measure and found to show good convergent and divergent validity when compared to the *Child Behavior Checklist* (Achenbach & Edelbrock, 1983) and the *State-Trait Anxiety Inventory for Children* (Spielberger, 1973; Birmaher et al., 1997). A 41-item version was assessed and item analysis and factor analyses found support for five factors (Birmaher et al., 1999). Each of the five factors demonstrated good internal consistency and discriminant validity (both between anxiety and depressive disorder, between anxiety and disruptive disorders, and within anxiety disorders). The 41 item *SCARED* is considered a valid and reliable measure for the study population as a study of adolescents aged 14-18 in a rural high school found adequate internal consistency ($\alpha = 0.93$) and test-retest reliability ($r = 0.703$) (Haley, Puskar, & Terhorst, 2011). The scale lists 41 statements of anxiety symptoms and participants are asked to rate if the statements are *Not True/Hardly Ever True (0)*, *Somewhat True/Sometimes True (1)*, or *Very True/Often True (2)* over the last 3-months. The *SCARED* produces scores categorized as five factors: Panic Disorder or Significant Somatic Symptoms (13 items), Generalized Anxiety Disorder (9 items), Social Anxiety Disorder (7 items), Separation Anxiety Disorder (8 items), and Significant School Avoidance (4 items). Only the nine items corresponding to the domain of Generalized Anxiety Disorder were utilized in this study. The prompt was altered to ask about symptoms over the past month rather than that last three months.

Depression. The *Center for Epidemiological Studies Depression Scale for Children (CES-DC)*; Weissman, Orvaschel, & Padian, 1980) was constructed by modifying the adult *Center for Epidemiological Studies Depression Scale (CES-D)* to make it easier to comprehend and more relevant for children and adolescents (Weissman, Orvaschel, & Padian, 1980). The *CES-DC* includes 20 items for which respondents indicate how much the item describes how they have felt over the past week, with response options ranging from 0 (not at all) to 3 (a lot). A validation study of the *CES-DC* found good internal consistency in a sample of adolescents ($\alpha = 0.86$) and in the overall sample which also included children ($\alpha = .84$) (Faulstich, Carey, Ruggiero, Enyart, & Gresham, 1986). The *CES-DC* was found to have moderate test-retest reliability for adolescents and it was stated that the *CES-DC* appears to assess state more than trait characteristics. A moderate but significant correlation was found between the *CES-DC* and the *Children's Depression Inventory* for the overall and adolescent samples.

Academic Efficacy and Disruptive Behavior. The *Patterns of Adaptive Learning Scales (PALS)*; Midgley et al., 2000) is a self-report inventory to assess students' motivation, affect, and behavior in relation to their learning environment. Students are asked to rate how true statements are for them ranging from 1 (*not at all true*) to 5 (*strongly agree*). The specific scales of Academic Efficacy and Disruptive Behavior were utilized in this study. The *PALS* Academic Efficacy scale includes five items that are designed to measure students' perceptions of their competence to do their classwork. Example items include "I can do almost all the work in class if I don't give up" and "I'm certain I can master the skills taught in class this year". The *PALS* Disruptive Behavior scale consists of five items designed to measure students' engagement in behaviors that disturb or disrupt the classroom. Example items include "I sometimes get into trouble with my teacher during class" and "I sometimes don't follow my teacher's directions

during class”. The *PALS* scales have been administered in nine ethnically diverse school districts across three Midwestern states. Acceptable internal consistency was found for the Academic Efficacy scale ($\alpha = 0.78$) and good internal consistency was found for the Disruptive Behavior Scale ($\alpha = 0.89$).

School attendance, disciplinary infractions, and home practice. Weekly, all students were asked to self-report the number of absences they had over the past week. Students were also asked if they received any disciplinary referrals (how many and what for). Students were also asked how many minutes over the past week they practiced any of the skills taught in the program outside of the class. Student attendance in each program session was also collected by facilitators across both conditions.

Acceptability and Feasibility. Participants, facilitators, teachers, and administration completed written surveys that had open ended questions as well as Likert style ratings. Both qualitative and quantitative written questions assessed how much participants liked the programs, how they were affected in relation to school and their general wellbeing, and what they learned or took away from the interventions. Facilitators were asked how comfortable they were in facilitating the program including most difficult aspects of implementation and suggestions for future implementation. Teachers were also asked what specifically they would change and “if the program is shown to be beneficial, how likely would you be to implement a similar curriculum in the future”. Additional questions for teachers included: “How comfortable would you be facilitating the program yourself?” and “Aside from a facilitation manual, what supports would you need to deliver the program (e.g. initial training, additional trainings, materials)?”. Examples of questions for administrators included: “Would you support future implementation

of Learning to *BREATHE* at the school? What would the school need?”. Similar questions were asked of the control group to assess acceptability of both programs.

Design

Study Procedures. The full length of the study spanned 8 weeks and included a 14-week follow-up after the intervention. The first week involved introducing the program to participants, gaining assent, and having them complete pretest assessment surveys. When surveys were collected, a member of the research team checked for suspect response patterns as well as full completion. If students skipped items or failed to answer every item, the student was provided with clarification regarding how to complete the assessment in the effort to elicit full completion and accuracy. Students were introduced to how to access written and audio content posted on the internet for future home practice in the third week of the study. Study staff administered the treatment and active control protocols two times per week for six weeks (weeks 2-7) during the semester. The treatment and active control protocols were administered during two 90-minute Health and PE class periods per week, occurring on two consecutive school days. Content was delivered for 60 of the 90-minute period, the remaining time was used for transitions, dressing out for yoga, and completion of surveys. A total of 12 sessions were administered consisting of approximately 12 hours of face-to-face time between treatment and active control facilitators and participants. The final, eighth week of the program, participants completed end-of-treatment evaluations and acceptability forms and returned to regularly programmed Health and PE class curriculum.

Three classes received six weeks of a manualized version of the *L2B* intervention plus yoga. Yoga took the first 30 minutes of class followed by the *L2B* curriculum for the remaining 30 minutes of class. The other two classes received six weeks of yoga for the first 30 minutes of

class followed a program of health education regarding stress and coping skills for the remaining 30 minutes. The research team was on site twice weekly to administer the treatment and active control protocols to all five classes during the regularly scheduled PE class time.

Intervention

Mindfulness program. *Learning to BREATHE (L2B)* is a group-administered mindfulness based intervention that can be delivered in either six or eighteen sessions (Broderick, 2013). The program is copyrighted and the manual was purchased from *New Harbinger Publishing* by the researcher. The program was initially developed as a school-based universal prevention program intended to enhance the development of social and emotional learning competencies in adolescents. The primary purpose of the program is to build socioemotional strengths necessary for the unique challenges occurring in adolescence. The program addresses several key areas of functioning. *L2B* attempts to cultivate awareness and self-compassion by encouraging students to practice monitoring unpleasant, pleasant, or neutral emotions, thoughts, and sensations. Self-regulation is emphasized to empower students to manage their emotions and behaviors to achieve their goals. *L2B* addresses distress tolerance by teaching skills necessary to avoid automatically responding to external stimuli in a negative or avoidant way. Finally, the program works to enhance executive functioning skills such as attention and error monitoring through mindfulness skills and focused attention during mindfulness exercises. *BREATHE* is an acronym appearing frequently throughout the program. Each letter of the acronym represents a lesson to be delivered during the program. The acronym stands for B (Listen to your Body), R [Reflections (thoughts) are just thoughts], E (Surf the waves of your Emotions), A (Attend to the inside and the outside), T try Tenderness—take it as

it is), H (practice Healthy Habits for a healthy mind), and E (gain the inner Edge...Be Empowered).

L2B utilizes core mindfulness-based stress reduction practices including awareness of thoughts and emotions, mindful movement, body scan, and loving kindness meditations. The program is semi-structured across each of the six lessons that were taught over 12 sessions in this study. Some of the content is scripted and specifically mapped out, while some content is left to meet the implementation needs of the environment. For instance, during several lessons students could be asked to journal or other relevant mindful activities may be substituted if preferred by the facilitator. Each lesson begins with a brief mindfulness practice period to transition into the group, followed by an introduction to the specific topic covered. Specific topics and activities include body and sensation awareness including mindful eating, breath awareness, and body scan, understanding thoughts and mindfulness of thoughts practices, emotions and mindfulness of emotions practices, awareness of attention including stress psychoeducation, mindful movement, and mindful walking, tenderness and compassion including taking care of oneself and loving/kindness practices, as well as habits for using mindfulness in daily life. See Table 2 for representation of the topics and activities that occur each week.

Table 2
Summary of Content of Learning to BREATHE Program by Week

Week and Topic	Activities
Week 1: Introduction to Mindfulness: Body and Sensation Awareness	Mindful Eating, Breath Awareness, Body Scan
Week 2: Thought Awareness	Mindfulness of Thoughts Practices
Week 3: Emotions	Mindfulness of Emotions Practice
Week 4: Attention	Stress Psychoeducation, Mindful Movement, Mindful Walking
Week 5: Tenderness/Compassion	Taking Care of Oneself, Loving Kindness Practice
Week 6: Habits: Using Mindfulness in Daily Life	Review, What I Wish for Myself Letter

L2B is a highly interactive program that requires more than just mindful practice during lessons. Following the introduction of the topic, students are presented with a variety of group activities and class discussion intended to enhance engagement and foster collaboration and openness within the group. All lessons provide an opportunity for in-class mindfulness practice. A brief mindfulness exercises closes each session. Adolescents were assigned mindfulness practices after each lesson to be completed in between lessons. Home practice assignments range from daily practices that last a few minutes to weekly mindfulness practices that may last 10-15 minutes. Student workbook activities and audios of guided meditations also accompany each lesson. Student workbook pages are designed to accompany the class lessons and can also provide opportunity for short periods of journal writing. The student workbook as well as audio of guided meditations were made available on the school's website and their use was incorporated into the home practice assignments. Due to limitations regarding when lessons could be held (i.e., on successive class days) certain homework assignments were modified or shifted to accommodate the short period in between lessons. Completion of reflections on home practice were checked as a way of assessing home practice of the adolescents. Additionally, a question of how many minutes practiced outside of the class was asked each week. Home practice resources were posted online and provided to the students in the form of a student workbook. Attendance was also collected of students who are present at each session to monitor exposure to the intervention.

Active Control. The classes in the active control condition participated in a *Stress Management and Coping Skills program (SM&C)*. This program was developed in a manner similar to the Health Enhancement Program (MacCoon et al., 2012) in the effort to include activities that do not incorporate mindfulness but instead are chosen to match mindfulness based

interventions as closely as possible while using valid ingredients in their own right. See Appendix B for the *SM&C* curriculum. The students were taught about the recommendations for managing stress from the American Academy of Pediatrics recommendations for teens (2015). See Table 3 for an overview of weekly topics and activities.

Table 3
Summary of Content of Stress Management and Coping Program by Week

Week and Topic	Activities
Week 1: Introduction to Stress Management and Relaxation	Stress psychoeducation and deep breathing
Week 2: Identifying and Addressing Problems	Personal stressors and positive and negative ways to respond. Time management strategies. Progressive muscle relaxation
Week 3: Taking Care of My Body	The power of exercise, nutrition, and sleep. Guided visualization.
Week 4: Taking Care of Thoughts and Emotions	Emotion vs. Problem focused coping. Healthy distraction. Journaling to process. Expressing self creatively. Music for relaxation.
Week 5: Taking Care of Relationships	Interpersonal skills, helping others makes us feel good, sources of social support
Week 6: Using Stress Management in Daily Life	Review, journal plan to continue stress management practices

Relaxation practices including deep breathing, guided visualization/visual imagery, progressive muscle relaxation, journaling, and listening to music were taught and practiced. The interpersonal skills are originally from *DEARMAN* of *DBT* (Linehan, 1993) and since have been used in short term group intervention with adolescents (Cone, Golden, & Hall, 2009). The *SM&C* program was structurally equivalent to the *L2B* program, beginning and closing with a relaxation practice, holding a review and check-in on home practice, including theme-based psychoeducation, incorporating stress management activities, relaxation practices, and related discussion, inviting to practice at home, and providing a workbook and audio guided practices.

The *SM&C* program was delivered in the same group format as *L2B*, meeting twice per week for 30 minutes, after delivery of a 30-minute yoga session, over six weeks.

Home practice included using stress management strategies and relaxation practices out of class. Home practice was recorded via use of a weekly question of how many minutes practiced as well as use of a log to reflect on and record instances of home practice. Home practice resources were posted online via Google Classroom and provided to the students in paper form at the beginning of the program. Attendance was collected of students who are present at each session to monitor exposure to the intervention. Students were provided with a workbook comparable in length to the workbook given in the mindfulness condition which includes worksheets and handouts from the Ways to Manage Stress Lesson of *HEALTHSmart* (2016) high school health education curriculum. Workbook completion and home practice were not tied to student course grades in either condition.

Yoga. Yoga that emphasized both relaxation and increasing musculoskeletal strength and flexibility was implemented across both conditions. Efforts were made to minimize/eliminate mindfulness principles or practices included in the yoga. The focus of the yoga content was on movement of the body and utilizing grounding and core strength to create balance in standing postures. Themes included opening/flexibility, strength, balance, and challenge. Yoga was implemented in both conditions to ensure the amount and type of physical activity was comparable between groups. See Table 4 for a summary of yoga content by week.

Table 4
Summary of Content of Yoga by Week

Week and Topic	Activities
Week 1: Breath Awareness	Cultivate breath awareness in the body with movement- beginning to move and breathe together in yoga practice.
Week 2: Grounding	Facilitate body awareness coupled with movement (noticing difficulties, differences and sensations)
Week 3: Opening	Beginning to open parts of the body we typically “close off”
Week 4: Strength	Using inner and core strength to lengthen poses and create new postures
Week 5: Balance	Utilizing grounding and core strength to create balance in standing postures
Week 6: Challenge	Trying something new with yoga

Behavioral reinforcement. To facilitate program participation, behavioral reinforcement was utilized across both intervention conditions to promote student attendance and class participation. Beginning in week three of both programs, students were randomly assigned into teams by counting off by fours, students then moved to sit with their team for the session, and teams were awarded points throughout the sessions for on task behavior and active participation. The team with the most points at the end of the session won for the day and each of the respective team member was awarded with a small prize which ranged from water bottles, to granola bars, to candy, to fruit depending on the day. The students’ teacher or a study team member awarded points during sessions and teams were re-assigned each session in the effort to mix the teams and ensure equal opportunity for the students.

Interventionist training. The project was supervised by a Licensed Psychologist/ Board Certified Behavior Analyst. Oversight of the study was conducted by the Institutional Review Board at East Carolina University. See Appendix A for the IRB approval form. All the facilitators across both programs were doctoral students. There were four total doctoral pediatric

psychology students who implemented the interventions; the primary researcher plus an additional doctoral student in the *L2B* condition; and the primary researcher plus two additional doctoral students in the *SM&C* condition. The primary researcher implemented treatments across both conditions. Both doctoral pediatric school psychology students who implemented *L2B* had previously facilitated mindfulness-based therapeutic interventions in clinical settings with adolescents. In addition, both *L2B* facilitators took a training course through *Mindful Schools* on mindfulness for educators. *Mindful Schools* is a non-for-profit training organization with online and in person courses available for training educators to teach mindfulness to students in schools. All doctoral students involved in either the mindfulness intervention or active control implementation had previous experience conducting interventions with adolescents in school settings as part of their previous practicum experiences. All the doctoral students had experience piloting their respective programs to small groups of adolescents prior to full implementation in the Health and PE classes to gain practice and familiarity with the administration of the programs. A certified yoga instructor with a master's degree in kinesiology and a minor in exercise psychology implemented the yoga portion of both interventions.

Treatment fidelity. Health and PE teachers completed fidelity checklists regarding implementation of *L2B* as well as the *SM&C* condition components during the sessions. The teachers received training in the curriculums including demonstrations of some content and how to complete fidelity checklists in a two-hour orientation that was conducted before the programs began. Forms were reviewed after implementation and a review of the forms with corrective teaching was provided to the teachers when inaccuracies were noted in form completion. The *L2B* fidelity checklist was obtained from the author of the *L2B* curriculum, Trish Broderick, Ph.D., and is based upon the primary components of *L2B* outlined in the treatment manual. Trish

Broderick, Ph.D. provided permission to include the fidelity forms in the appendix via email. The *SM&C* fidelity checklist was based upon the American Academy of Pediatrics (2015) recommendations for managing stress with incorporation of the coping skill content and structure equivalent to the *L2B* curriculum.

Each week, teachers completed fidelity checklists to provide the fidelity ratings for their respective classes. See Appendix C for the fidelity forms. An average of the ratings for each week was calculated for each treatment condition to provide one fidelity score for each week for each condition. Additionally, members of the research team including the project supervisor periodically observed in each treatment condition and completed fidelity checklists to calculate inter rater agreement. During week one, one research team observation was completed in the *L2B* condition to provide inter rater agreement on fidelity ratings. No research team fidelity raters observed during weeks 2 or 3 so inter-rater agreement could not be calculated for those weeks. During week four, two research team observations were completed in the *L2B* condition and one was completed in the *SM&C* condition. During week five, three research team observations were completed in the *L2B* condition and one was completed in the *SM&C* condition. During week 6, two research team observations were made during the *L2B* condition. For weeks with more than one research team fidelity observation was completed in the *L2B* treatment condition, the percent agreement of the research team observations with the teacher fidelity ratings was averaged to create one weekly score for inter rater agreement. Fidelity was monitored so it never dropped below 70% through the course of the interventions for both conditions.

Data Collection

Participant families were asked to complete a demographics information sheet before the enhanced Health and PE programs begin. This was sent home in a packet along with information regarding the purpose of the study. The students were asked to complete a brief student demographics form the week prior to the start of the study at the school. Assessment

Table 5
Assessment Schedule

Assessment	Weekly	Pre-Treatment	Post Treatment	Follow Up
Demographic & Background Information		X		
Self-Report of Attendance	X			
Self-Report of Home Practice	X			
Self-Report of Discipline Referrals	X			
<i>PSS-10</i>	X			
<i>DERS</i>	X	X	X	X
<i>CAMM</i>	X	X	X	X
<i>AFQ-Y8</i>	X	X	X	X
<i>SCARED</i>		X	X	X
<i>CES-DC</i>		X	X	X
<i>PALS</i>		X	X	X
Fidelity Checklists	X			
Feasibility Form for Facilitators			X	
Acceptability Survey			X	

data was collected weekly for some scales and at three points in time: initial, end-of-treatment, and 14-week post-treatment follow-up. See Table 5 for a summary of the assessment schedule.

Initial, end-of-treatment, and follow up assessments. At initial, end-of-treatment, and follow up time points, participants completed the *PSS-10*, *DERS*, *CAMM*, *AFQ-Y8*, *SCARED* *GAD* subset of items, *CES-DC*, and the *PALS* Academic Efficacy and Disruptive Behavior subscales. The follow up assessments were distributed to the students during school time 14 weeks after the eighth week of the study. To gather as much follow up data as possible, research staff went to gather follow up data for two subsequent weeks after the initial attempt to continue

to gather the follow up data for students who had not yet completed the follow up assessments due to absence or school related conflict (e.g. taking a test).

Weekly assessments. The *PSS-10*, *DEERS*, *CAMM*, and *AFQ-Y8* were administered weekly through the duration of the intervention implementation. Directions were included to prompt the students to reflect on the past week. The reduction of stress (measured by *PSS-10*), development of emotional regulation (as measured by the *DEERS*), reduction of judgmental responses to emotion and increase in present moment awareness (measured by *CAMM*), and reduction of fusion and experiential avoidance (measured by *AFQ-Y8-Y*) were hypothesized to be the mechanisms underlying the impact of mindfulness. The measures administered weekly were designed to provide insight in the development of these potential underlying mechanisms. Students were also asked about their attendance, disciplinary referrals, and home practice each week. Weekly surveys were administered during the first session of the week, so that students who were absent were often present at the second weekly session to complete the assessments. Additionally, pretest and posttest and follow up portions of the assessments were checked to reduce the likelihood of missing data. Validation check items were also used as indicators of validity of the scale. If the validation item was checked incorrectly and the response profile suggested questionable response pattern, which is an indication that participants were not attentive to the content of the survey questions, the data from that form was omitted from data analysis.

End-of treatment assessments. During the week following the end of treatment, participants, program facilitators, teachers, and an administrator completed acceptability surveys for both the intervention and control groups.

Data collection procedure. Each student participating in the study was assigned a random ID number. The ID number assignments were in a locked briefcase with a 3-digit code required for access. Surveys were prepared with ID numbers already listed on each one and handed out to the students by calling their names, so that no survey had a student name on it. Once surveys were returned, they were temporarily placed in a locked briefcase until they were transferred to a locked cabinet on site. Weekly, data was transferred from the high school to the East Carolina University research lab where it was stored in a locked cabinet behind a locked door. Data had been completely de-identified before this process took place by randomly assigning alphanumeric codes to each study participant.

Data entry procedure. In the research lab, de-identified paper surveys were hand-scored based on each instrument's scoring guidelines. Data for surveys that included both an incorrect answer on a validity item and a suspect profile (e.g. 1st half of survey marked all 1's, 2nd half marked all zeros) were omitted from data entry. Data that included a grossly suspect data profile (e.g. all 0's marked) were omitted when the validity item correct score was the same response (e.g. also 0). When a student circled two answers for one item, the response was omitted from entry. Members of the study team entered the data into *REDCap* (*Research Electronic Data Capture*; Harris et al., 2009), a HIPPA secure electronic data entry system. Study data were managed using *REDCap* electronic data capture tools hosted at East Carolina University. *REDCap* is a secure-web-based application designed to support data capture for research studies which provides an interface for validated data entry and automated procedures for data downloads. Sums of scale scores auto calculated by *REDCap* based on item entries were cross checked with hand scored sum scores as identical to ensure accuracy of the data.

Scale scores of totals of all items for one scale at each time point were used for analyses. Data was downloaded to Excel, then it was uploaded to *R* (*R* core Team, 2016) for analysis.

Data Analysis

Feasibility and fidelity. To answer the first research question, feasibility of each program was evaluated using data regarding the degree to which the curriculum was followed, descriptions of how the curriculum was modified, and successes and difficulties encountered during implementation. This information was obtained through fidelity checklists completed by observers as well as a feedback form that was provided to the program facilitators. The Health and PE teachers were previously made familiar with each program's survey and completed a treatment fidelity checklist every session. Descriptive statistics were calculated regarding the percentage of components that were implemented with fidelity for each session as well as each component across sessions. A Student's t-test compared the fidelity data between the two conditions. The facilitator feedback forms asked each facilitator to describe the successes and difficulties encountered during the implementation. The results of the feedback form were coded for themes that are present for each condition.

Acceptability. To answer the second research question regarding evaluating the acceptability of each program, overall acceptability was calculated based on Likert style format survey responses from the students, teachers, and administrators. Student t-tests evaluated differences in the acceptability data. Written responses were qualitatively coded for themes related to feedback from students, teachers, and administrators.

Efficacy. Scale scores were calculated per the scoring instructions of each measure to yield a total score for each student for each measure at each time point. Descriptive statistics for outcome measures at each time point were calculated in *REDCap* including mean, median, and

standard deviation. Missing data was handled with the Full Information Maximum Likelihood (FIML). FIML is a model-based method of handling missing data. Missing data and model estimation are handled simultaneously. FIML assumes data is missing at random (and is unbiased if data is either missing at random or missing completely at random). FIML computes a likelihood for each case based on the observed data and uses variables in the model to recover missingness. In R, the lavaan package (Rosseel, 2012) was used to fit models with FIML.

To answer the research question regarding the efficacy of the *L2B* program compared to a control condition in enhancing psychological outcomes, linear regression estimated the change in the dependent variables of stress, emotional regulation, nonjudgmental, nonavoidant responses to private experiences and present moment awareness, avoidance and fusion, as well as symptoms of anxiety, depression, academic efficacy, and disruptive behavior between groups from posttest and pretest to follow up in *R*. Residuals were analyzed to evaluate differences in dependent variables between groups. The residual is the difference between the model prediction and that actual data point. Difference scores are commonly used to characterize change across time points (Schoemann, Gallagher, & Little, 2015).

Pre-test score was entered as a covariate for each model to control for the initial score on each measure. Sex, race, and parent education as a proxy for socio-economic status were all entered into the regression as covariates. In prior studies, Broderick and Metz (2009) and Broderick and colleagues (2013) called for an evaluation of the program's effect with more diverse populations and had previously used gender ethnicity and parent education as variables of interest in their studies. For the purposes of the analyses, groups with very few participants for whom variances were unable to be estimated were combined with other categories. Since there was only one transgender participant, the gender category was transformed into sex

assigned at birth (male and female). Race was classified into four groups (African American, Caucasian, Hispanic/Latino & Other). Parent education was classified as less than high school diploma, graduated high school or some college but no degree, or associates degree or higher education.

Since stress has been found to be predictive of developing anxiety and depression in prior studies (Braet, Vlierberghe, Vandevivere, Theuwis, & Bosmans, 2013; Edwards, Adams, Waldo, Hadfield, & Biegel, 2014) pre-test scores for the *PSS-10*, *SCARED* GAD subset of items, and *CES-DC* were entered into the models to prevent confounding of these variables on the models. A recent study of *L2B* by Bluth and colleagues (2016) utilized a sample of students with behavioral difficulties at an alternative high school and found the program had significant effects on depressive symptoms, so the pre-test score for the *PALS Disruptive Behavior* scale was also included as covariate to control for the impact having behavioral difficulties could have on response to the program. These covariates were used to control for internalizing and externalizing problems may have had on response to the programs.

Students often were confused on the question about amount of home practice and often left this blank or counted time for all their homework on that question. The data for this variable was lacking and often deemed inaccurate; therefore, it was not included in the analysis. Dummy variables were created to represent the groups in the model. A dummy variable related to class of each participant was created so that their class could be entered as a covariate to control for class level influences. However, this variable was found to be redundant with sex and race variables so it was not used in the analysis. Treatment group was used as a predictor to estimate the difference in changes of dependent variables between treatment and control groups.

To answer the research questions regarding how the treatments affected the hypothesized mechanisms of mindfulness and stress over time, growth modeling was used to describe the changes in nonjudgmental response and present moment awareness (as measured by the *CAMM*), avoidance and fusion (*AFQ-Y8*), emotional regulation (as measured by the *DEERS*), and stress (as measured by the *PSS-10*), (all measured weekly for 7 weeks) within the mindfulness group compared to the control group. Scale scores were calculated per the scoring instructions of each measure to yield a total score for each student at each time point. Scores for each participant at each of the seven-total time points (pretest, weeks 2-6, posttest) were analyzed in growth models in *R*. Dummy variables were created for classrooms to control for the effect that classrooms may have had on the student response data. Initial regressions of slope onto dummy variables of classes were not significant in any of the models indicating that class did not play a significant role in the growth of stress, emotional regulation, avoidance and fusion, or nonjudgmental response and present moment awareness of the students. There was not a significant variability across classes, and class dummy variables were again found to be redundant with race and sex variables so were ultimately not used in growth model analyses. Linear, nonlinear basis, as well as quadratic growth models were fit to examine multiple possibilities regarding the trends of growth.

CHAPTER III: RESULTS

Feasibility/Fidelity

Facilitator Feedback. Two Pediatric School Psychology doctoral students facilitated the *L2B* curriculum implementation. These facilitators indicated the program to be important (N =1) or very important (N = 1) for the students to receive and both facilitators reported they were either comfortable (N=1) or very comfortable (N=1) in facilitating the program. Aspects of the program that both facilitators indicated were liked or very liked by students included mindful breathing practice, mindful movement practice, group discussions, workbook, learning how to handle feelings better, and learning how to handle the body's stress system. Both facilitators rated that they believe students liked the program overall.

Given the facilitators had experience piloting their respective programs to small groups of adolescents prior to full implementation in the Health and PE classes to gain practice and familiarity with the administration of the programs, facilitator's suggestions for what would be needed for teachers to implement the program in the future in addition to the manual included providing an initial teacher training of 9-10 hours to experience the *L2B* program for themselves and an additional 10 hours of follow up training to practice administration. The most difficult aspects of facilitating the *L2B* program included that facilitators reported that initially, the classroom structure wasn't conducive to facilitating content (e.g. many students were used to being allowed to have their phones and Chromebooks out in class) and it was difficult to manage the behavior of students who were disruptive and not interested in participating. Additionally, some students had difficulty grasping the abstract content. Facilitators made several suggestions including: the program needs more engaging activities and less lecture; students find *mindfulness of emotions* easier and perhaps placing this first would be beneficial; change the order of the

themes, placing emotion and attention and tenderness concepts earlier because they are easier to grasp; and meditation was very difficult at first and the long version of the body scan was too long when they have not fully bought into the concept yet. Concerns with future implementation of the program included: teachers have inadequate backgrounds in mindfulness; teachers need more initial training and accountability for participating. One teacher of classrooms in both conditions did not consistently participate in the program implementation and occasionally left the room. There was not a structured way to address this lack of teacher buy in formally and led to an environment which made it more difficult for facilitators to maintain behavioral control of the classrooms. Facilitators noted that behavioral management of the classrooms needs to be in place prior to and during the implementation because “If future facilitators and teachers did not have command of the classrooms, programming will be ineffective”; and future facilitators “Need to consider ways of engaging those students who are disruptive and not interested in participating.”

Three Pediatric School Psychology doctoral students facilitated the *Stress Management and Coping* program. Facilitator feedback regarding satisfaction with the *SM&C* program ranged from neutral (N=2) to satisfied (N=1). Facilitators indicated the program to be important (N =2) or very important (N = 1) for the students to receive and all facilitators reported they were very comfortable in facilitating the program. Facilitators indicated students either liked or very much liked the following: education about stress, deep breathing relaxation, listening to music for relaxation, in-class presentations, group discussions, and learning how to handle thoughts and feelings better. The *SM&C* program was rated as liked overall by all facilitators. Suggestions for what would be needed for teachers to implement the program in the future included: a 2-hour initial teacher training; modeling and feedback for teachers about program implementation; and

resources for dealing with emotions to supplement other segments. All facilitators rated the program as easy to implement. Reports of what was the most difficult aspect of facilitating the program included behavior management of students in the classroom and encouraging students to reflect on personal experiences. Suggestions of beneficial changes to the program included: tailor the examples and materials to the age group and population; include daily reflections in the student workbook; and incorporate more movement and hands-on activities. Concerns regarding future implementations included: a facilitator needs to be trained in use of behavioral management and it would be helpful to include case scenarios and have students work in groups to answer questions.

Fidelity. Overall, the *L2B* curriculum was implemented with 96.64% fidelity. Weekly implementation of all components ranged from 91.67% (week 2) to 100% (week 5). The *SM&C* condition curriculum components were implemented with 93.06% fidelity. Weekly implementation ranged from 86.67% (week2) to 100% (week 6). Overall, there was not a significant difference in implementation of the two programs (see Table 6). Inter-rater agreement averaged to be 96.32 across the *L2B* condition and 92.71 across the *SM&C* condition.

Table 6
Implementation Fidelity of all Components by Week

	<i>L2B</i>		<i>SM&C</i>	
	Fidelity	Inter-rater agreement	Fidelity	Inter-rater agreement
Intervention week 1	96.50	94.74	88.89	--
Intervention week 2	91.67	--	86.67	--
Intervention week 3	94.44	--	97.06	--
Intervention week 4	99.17	97.5	89.07	93.75
Intervention week 5	100	95.56	96.67	91.67
Intervention week 6	98.04	97.06	100	--
Total	96.64	96.74	93.06	92.71

When evaluating individual components week to week across curriculums, many aspects were implemented identically regarding organization, planning, and coverage of curriculum content including a *conducive setting, materials were prepared in advance; a 3-part structure of sessions with individual elements in order* (see Table 7).

Table 7
Implementation Fidelity by Component Across all Weeks

	<i>L2B</i>		<i>SM&C</i>	
	Fidelity	Inter-rater agreement	Fidelity	Inter-rater agreement
Setting Conducive	100	100	100	100
Materials Prepared	100	100	100	100
3 Part Structure	100	100	100	100
Individual Elements in Order	100	100	100	100
Clear Presentation	94.44	87.5	100	100
Extraneous Concepts Omitted	72.22	77.78	77.78	50
Review and discuss home practice	96.67	92.86	93.06	100
Home practice instructions	100	75.00	91.67	100

There was some variance about *clear presentation* (94.44% for *L2B*, 100% for *SM&C*), *review and discussion of home practice* (96.67% for *L2B* and 93.06% for *SM&C*), and *home practice instructions* (100% for *L2B* and 91.67% for *SM&C*). The *extraneous concepts omitted* component had overall the lowest fidelity average, partly due to error in fidelity ratings. After week 2 of implementation it was brought to the attention of the research team that one of the teacher fidelity raters was omitting ratings on the *extraneous content omitted* item on the fidelity form. Completion of the form was reviewed with this teacher and this reported they had overlooked it as the last item on the form. After the corrective teaching, this teacher's ratings changed from 33.33% fidelity to 91.67% with 100% inter-rater agreement over 3 different observations. This explains some of the low fidelity with regards to *extraneous concepts*.

Otherwise, *discussion of classroom management concepts and review of behavioral expectations in class (e.g. appropriate language)* were considered extraneous at some points. Additionally, there were low rates of homework completion across conditions, which yielded lack of *discussion of home practice* at some points.

In terms of successes with implementation of the *SM&C* condition curriculum, teachers reported: using personal examples to aid in student understanding “very good job relating to the students”; “good example on breathing”; and “nice job giving personal examples of how stress affects the body”; “lots of personal examples – that really helps students understand”; and students appeared particularly engaged when movement was incorporated into the lessons. From the *L2B* curriculum, the “how much can you handle” and “mindful walking” exercises were viewed by the teacher as liked by the students. Their feedback also included “love the idea with the tennis ball” and “like the movement, gets good responses”.

The lack of movement in the *SM&C* condition is one area that may have detracted student attention and motivation. Other factors causing difficulties with implementation across both conditions were intermittent interruptions during class including: students coming late to class or leaving early; a fire drill; teachers leaving occasionally the room; and periodic announcements over intercoms. These are situations commonly encountered in schools and sparked a comment from one of the teachers who noted “very nice job even with all the outside chaos”.

Class wide behavioral reinforcement programs were implemented in the third week across all classes, and resulted in increased attention and compliance in class. These programs were implemented in the classroom during the curriculum sessions and not during the yoga sessions in the gym, resulting in decreased compliance with participating in yoga as compared

with the curriculum content. Teachers noted that, in hindsight, many of the students needed additional reinforcement (e.g. rewards or participation grade assignments) to motivate them to participate in yoga. Many of the students chose to lay on their mats rather than try yoga. Some of the students mocked other students who were engaged with yoga, which was responded to with planned ignoring and/or redirection and did not seem to cause significant problems among students.

Acceptability

Teacher Feedback. Two teachers who had each had 1-3 years of experience in teaching completed the teacher feedback forms. Teacher feedback from both teachers whose classes received the *L2B* program indicated the teachers were satisfied with implementation of the programs. The likelihood of implementing the program in the future was rated as in between neutral and likely. The teachers rated that it was important the students receive the *L2B* program and that it was a good fit for Health and PE course goals and curriculum. One teacher's feedback noted changes at the school that could be attributed to the *L2B* program as "at times I heard the students talking about it helping them relax". This teacher indicated feeling neutral about facilitating the program himself and that he would need more to implement the program in the future, but what more, he is not exactly sure. His feedback indicated that his concerns with future implementation would be length, and he suggested keeping the same amount of content and implementing it over back-to-back days as a unit rather than incorporating it several days a week over six weeks.

Teacher feedback from the teacher whose classes received the *SM&C* program indicated satisfaction with implementation of the program. The likelihood of implementing the program in the future was rated as very likely. The teacher rated that it was very important the students

receive the *SM&C* program and that it was a good fit for Health and PE course goals. Teacher feedback did not note changes at the school that could be attributed to the *SM&C* curriculum. The teacher indicated feeling neutral about facilitating the program herself. She reported she thinks the program needs to be “more interesting” and “more hands on”. She would “keep the breathing portion and the active part when the kids got up”.

Administrator Feedback. The school principal completed administrative versions of the feedback survey for both programs. The principal reported he was satisfied with both programs and views both programs as important for students to receive. He indicated it was extremely likely he would support future implementation of the *SM&C* program while it was likely he would support future implementation of the *L2B* program. He indicated he has noticed positive changes in the school that he attributes to the *L2B* program in that “our students coming out of Health and PE have been much more calm in returning to their next class”. Positive changes in the school that could be attributed to the *SM&C* program included “our 9th grade students have actually had less discipline incidents as compared to previous 9th grade cohorts”. He reported a facilitator manual and program materials would be required to implement both programs in the future. He did not indicate concerns with future implementations of either program and did not recommend changes to either program with future implementations. He noted on the *L2B* feedback form “we were very pleased!”.

Student Feedback. Students completed feedback surveys at the end of both programs.

Lasting Value of the Program. Students were first asked if they feel they learned or gained something of lasting value or importance because of participating in their respective program. Student’s t-testing revealed no significant differences in responses of the two groups. Of the 46 students in the *L2B* program that answered this question, 34 (73.9%) students

answered yes, 2 (4.3%) students answered no, and 10 (21.7%) students responded they were unsure. Students in the *L2B* program were asked to describe what they learned from the program and their responses were coded into themes. The most common theme students reported was *learning to use breathe to modulate emotions*, followed by *learning to practice mindfulness*, *learning to deal with stress*, *increasing awareness of thoughts and/or feelings*, *listening to the body*, and *paying attention*.

Of the 28 students in the *SM&C* program that answered this question, 19 (67.9%) students answered yes, 3 (10.7%) students answered no, and 6 (21.4%) students responded they were unsure. Students in the *SM&C* program most commonly reported *learning about stress*, followed by *learning relaxation techniques*, *learning how to deal with emotions*, and *learning strategies for interactions in relationships*.

Importance of the Program. Students also answered how important they considered the programs. Most students in the *L2B* program responded that they felt neutral (20 students, 43.5%) or that the program was important (19 students, 41.3%). Less commonly some students responded the program was very important (2 students, 4.3%), unimportant (2 students, 4.3%), or very unimportant (3 students, 6.5%). Similarly, most students in the *SM&C* program responded they felt neutral (11, 37.9%) or that the program was important (10, 34.5%), followed by very important (3, 10.3%), unimportant (3, 10.3%), and very unimportant (2, 6.9%).

Usefulness of the Program. Students responded on how useful they found different components of each program by rating them on a five-point scale (1=not useful, 5 = very useful). Components of *L2B* commonly reported as very useful were mindful breathing practice (16 students, 34.8%), mindful movement practice (10 students, 21.3%), and loving kindness practice (10 students, 21.3%). Aspects of the *L2B* program students most frequently reported as not

useful were the body scan (15, 31.9%), group discussions (14, 30.4%), and practice audios (22, 44.7%). Overall, more than half of students reported they found learning about the body's stress system was either quite useful or very useful (24 students, 51.1%), although 12.8% students responded it was not useful. Twenty-one students also found learning how to handle feelings better as either quite or very useful (44.6%), although 25.5% of students responded it was not useful. Most students also responded learning how to handle thoughts better was very or quite useful (25, 53.2), although 21.3% reported it was not useful. Overall, out of 47 respondents, 18 (38.3%) reported the *L2B* program to be very useful, seven (14.9%) students responded that the program was quite useful, eight (17.0%) students responded it was somewhat useful, four (8.5%) students reported it was a little useful, and six (12.77%) students reported it was not useful.

Components of the *SM&C* program most often reported as very useful by students included listening to music for relaxation (13, 44.8%) and deep breathing relaxation (10, 34.5%). Components of the program with the most frequent indications as not useful were practice audios (13, 46.6%), in class presentations (7, 25%), and progressive muscle relaxation (7, 24.1%). More than half of students responded that learning how to better take care of their body (15, 51.7%), learning how to handle thoughts better (16, 57.1%), learning how to handle feelings better (17, 60.7%), and learning about how to better care for relationships (16, 55.1%) were either quite useful or very useful. Some students indicated learning about how to better care for relationships (6, 20.7%), learning how to handle feelings better (4, 14.3%), learning how to handle thoughts better, 5, 17.9%), and learning to take better care of my body (4, 13.8%) as not useful. Overall, out of twenty-nine respondents, eleven (37.9%) reported the *SM&C* program to be very useful, six (20.7%) students responded that the program was quite useful, three (10.3%) students responded it was somewhat useful, three students (10.3%) reported it was a little useful,

and six (20.7%) students reported the program to be not useful. There was not a significant difference in the usefulness of the programs reported by students.

Programs' effect on school. Students were asked if their respective program affected them in relation to school. Of the 47 students in the *L2B* program that answered this question, 15 (31.9%) students answered yes and 32 (68.1%) students answered no. Students most commonly reported the program helped them in interactions with others at school, helped them cope with stress related to school, and helped them to pay attention/listen/focus. Of the 29 students in the *SM&C* program that answered this question, 9 (31.0%) students answered yes and 20 (69.0%) students answered no. Students most commonly reported the *SM&C* program helped them to better deal with school stress followed by it helped to deal with emotions at school. There was not a significant difference in two programs effect on school according to the students.

General Well-being. Out of 46 respondents, 22 (47.8%) reported the *L2B* program affected their general well-being while 24 (52.2%) responded it did not. Out of 28 respondents, eight (28.6%) reported the *SM&C* program affected their general well-being while 20 (74.4%) responded it did not indicating that a higher percentage of students responded that the *L2B* program affected their general well-being compared to the *SM&C* program. Themes reported included how the *L2B* program helped to calm down when nervous, make me happier, nicer, or kinder, reduce stress, and pay attention. Themes reported from *SM&C* program included improved general well-being included reduced stress, helped to relax, helped with focusing on important things in life.

What Students Would Change. Students responses on what they would change about the *L2B* program ranged from some students wanting more time for the program and some students wanting less time. Some students wanted to add yoga and some wanted to remove yoga. Some

students responded to add games and to add more movement. Regarding the *SM&C* program, students responded they would like more stress reduction materials, less yoga, add art or paint activities, and more one-on one time and less group discussion.

Recommend the Program to Others. Out of 43 respondents, 39 (90.7%) students reported they would recommend the *L2B* program to others. Out of 27 respondents, 20 (74.1%) of students reported they would recommend the *SM&C* program to others. Students reported they would recommend the *L2B* program for a variety of reasons, most commonly including to help relieve stress. For example, one student reported “because many teens stress about unnecessary stuff and should learn to focus more on your body.” Students also recommended the *SM&C* program largely because it helps relieve stress.

Home Practice. Many students in the *L2B* program responded they never practiced at home either formally (16, 35.6%), with audio downloads (35, 77.8%), or informally (14, 31.9%). Students who indicated they practiced formally most often did so once a week (10, 22.2%) or 2-3 times per week (9, 20.0%). Similarly, many students in the *SM&C* program responded they never practiced at home either formally (14, 50.0%), with audio downloads (22, 78.6%), or informally (11, 39.3%). Students who practice formally most often did so once a week (6, 21.4%) or every day or nearly every day (5, 17.9%). There was no difference in the amount of home practice completed by students according to Student’s t-tests.

Efficacy

Descriptive Statistics. Descriptive statistics were calculated for all the dependent variables. All dependent variables were self-reported by participants. See tables 8-15 for

descriptive data for the *PSS-10*, *DERS*, *CAMM*, *AFQ-Y8*, *SCARED* GAD subset of items, *CES-DC*, and *PALS* by treatment group.

Table 8
Descriptive Statistics for Perceived Stress Scale (PSS)

Condition	<i>L2B Treatment Condition</i>				<i>SM&C Control</i>			
	N	Mean	Median	Standard Deviation	N	Mean	Median	Standard Deviation
Pretest (time1)	45	17.73	17.00	8.21	29	18.83	19.00	7.64
Intervention week 2	43	17.65	17.00	8.55	22	20.14	20.50	7.94
Intervention week 3	39	18.72	19.00	7.81	21	17.38	16.00	6.89
Intervention week 4	33	18.85	17.00	8.02	24	17.83	17.00	8.18
Intervention week 5	39	18.41	17.00	7.16	20	18.20	18.50	7.79
Intervention week 6	32	19.16	19.00	7.66	12	17.75	19.00	8.27
Posttest (time 7)	42	17.40	16.50	9.29	26	19.23	18.50	8.23
Follow up (time 8)	43	17.00	18.00	9.21	27	17.93	17.00	7.47

Table 9
Descriptive Statistics for Difficulties in Emotional Regulation Scale (DERS)

Condition	<i>L2B Treatment Condition</i>				<i>SM&C Control</i>			
	N	Mean	Median	Standard Deviation	N	Mean	Median	Standard Deviation
Pretest (time1)	45	89.42	85.00	28.18	27	94.04	93.00	25.20
Intervention week 2	43	91.35	90.00	21.73	21	95.43	91.00	27.80
Intervention week 3	39	88.82	95.00	21.51	20	93.75	89.50	27.86
Intervention week 4	32	91.91	98.50	21.30	22	93.09	91.50	27.31
Intervention week 5	36	91.00	95.50	21.67	19	96.68	88.00	32.75
Intervention week 6	36	92.81	93.00	23.68	18	92.50	95.00	24.89
Posttest (time 7)	44	93.02	94.00	20.72	27	93.07	94.00	25.71
Follow up (time 8)	40	87.83	91.00	25.49	24	89.04	90.00	23.29

Table 10
Descriptive Statistics for Child and Adolescent Mindfulness Measure (CAMM)

Condition	<i>L2B Treatment Condition</i>				<i>SM&C Control</i>			
	N	Mean	Median	Standard Deviation	N	Mean	Median	Standard Deviation
Pretest (time1)	45	24.67	25.00	7.50	28	24.29	24.00	8.16
Intervention week 2	41	27.32	28.00	7.59	21	25.38	28.00	9.96
Intervention week 3	36	26.97	28.00	9.55	20	27.15	28.50	11.87
Intervention week 4	35	26.63	26.50	10.27	22	24.32	25.50	11.40

Intervention week 5	35	27.29	28.00	9.50	17	28.53	30.00	10.70
Intervention week 6	30	26.93	26.00	9.56	13	26.31	26.00	11.63
Posttest (time 7)	42	26.67	26.50	9.51	26	25.69	27.50	10.45
Follow up (time 8)	41	26.41	26.00	9.73	26	26.46	28.00	10.01

Table 11

Descriptive Statistics for Avoidance and Fusion Questionnaire for Youth (AFQ-Y8)

Condition	<i>L2B Treatment Condition</i>				<i>SM&C Control</i>			
	N	Mean	Median	Standard Deviation	N	Mean	Median	Standard Deviation
Pretest (time1)	45	19.69	19.00	6.47	29	22.66	22.00	7.82
Intervention week 2	43	19.53	20.00	7.89	21	21.29	22.00	7.82
Intervention week 3	37	19.14	19.00	7.18	21	20.29	18.00	9.19
Intervention week 4	34	18.68	19.50	8.37	23	20.04	17.00	8.23
Intervention week 5	39	18.15	18.00	6.47	21	21.52	23.00	9.89
Intervention week 6	34	16.56	15.50	7.08	13	19.46	20.00	8.85
Posttest (time 7)	45	18.04	18.00	7.41	24	20.21	20.00	9.45
Follow up (time 8)	42	19.07	17.50	7.85	27	20.56	18.00	8.32

Table 12

Descriptive Statistics for the Screen for Child Anxiety Related Disorders (SCARED)

Condition	<i>L2B Treatment Condition</i>				<i>SM&C Control</i>			
	N	Mean	Median	Standard Deviation	N	Mean	Median	Standard Deviation
Pretest (time1)	40	7.45	7.50	4.34	29	8.72	9.00	4.46
Posttest (time 7)	40	8.03	7.00	4.79	23	7.39	9.00	5.23
Follow up (time 8)	40	7.80	6.50	4.39	24	9.21	8.00	5.23

Table 13

Descriptive Statistics for Center for Epidemiological Studies Depression Scale for Children (CES-DC)

Condition	<i>L2B Treatment Condition</i>				<i>SM&C Control</i>			
	N	Mean	Median	Standard Deviation	N	Mean	Median	Standard Deviation
Pretest (time1)	37	16.65	12.00	13.13	23	17.3	19.00	10.00
Posttest (time 7)	40	17.13	15.00	11.00	25	20.52	20.00	10.41
Follow up (time 8)	39	16.90	13.00	13.51	24	17.96	13.50	11.43

Table 14
Descriptive Statistics for the PALS Academic Efficacy subscale

Condition	<i>L2B Treatment Condition</i>				<i>SM&C Control</i>			
	N	Mean	Median	Standard Deviation	N	Mean	Median	Standard Deviation
Pretest (time1)	44	19.11	19.00	4.75	29	18.03	17.00	4.40
Posttest (time 7)	44	17.41	18.00	5.86	25	14.16	16.00	5.83
Follow up (time 8)	44	19.66	21.50	4.79	26	17.38	18.00	4.85

Table 15
Descriptive Statistics for the PALS Disruptive Behavior subscale

Condition	<i>L2B Treatment Condition</i>				<i>SM&C Control</i>			
	N	Mean	Median	Standard Deviation	N	Mean	Median	Standard Deviation
Pretest (time1)	45	8.62	7.00	4.06	29	10.17	9.00	4.76
Posttest (time 7)	40	9.05	8.00	4.33	24	8.67	7.50	4.72
Follow up (time 8)	44	8.95	7.50	4.89	24	9.67	8.50	4.90

Regression. Linear regression was used to describe the relationships between independent variables and the posttest as well as the follow up scores. See Tables 16-23 for unstandardized *B*, standard errors, *p* values, and intercepts.

Stress. The models accounted for 31% of the variance in *PSS-10* posttest score, $F(11, 69) = 79.29, p < .001, R^2 = .31$ and 39% of the variance in *PSS-10* follow up score $F(11, 69) = 65.12, p < .001, R^2 = .39$. *PSS-10* posttest and follow up scores were significantly predicted by *PSS-10* pretest score. Students with higher *PSS-10* scores at pretest had significantly higher *PSS-10* scores at both posttest and follow up. Treatment group, sex, race, parent education, and pre-test score for *CES-DC*, *SCARED* GAD subset of items, or *PALS DB* did not significantly predict *PSS-10* scores at posttest or follow up.

Table 16
PSS-10 Regression

	Posttest			Follow Up		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Treatment	-0.755	1.325	0.569	0.204	1.405	0.884
<i>PSS-10</i> Pretest Score	0.617	0.134	<0.001**	0.556	0.140	<0.001**
Sex	-0.932	1.473	0.527	2.627	1.531	0.086
African American	2.866	2.669	0.283	2.717	2.874	0.344
Caucasian	-0.395	2.709	0.884	3.140	2.892	0.278
Hispanic/Latino	3.027	2.655	0.254	3.808	2.893	0.188
Parent Ed: less than HS	-3.905	2.204	0.076	0.754	2.537	0.766
Parent Ed: HS grad	-2.048	1.772	0.248	2.579	1.981	0.193
<i>CES-DC</i> pretest score	0.145	0.094	0.122	0.032	0.115	0.780
<i>SCARED</i> pretest score	0.390	0.205	0.058	0.423	0.250	0.090
<i>PALS DB</i> pretest score	-0.200	0.170	0.238	0.118	0.172	0.493
		Intercept = 5.006			Intercept = -6.757	

* $p < .05$. ** $p < .01$

Emotional Regulation. The models accounted for 47% of the variance in *DEERS* posttest score, $F(12, 68) = 56.49, p < .001, R^2 = .47$ and 31% of the variance in *DEERS* follow up score $F(12, 68) = 70.754, p < .001, R^2 = .31$. *DEERS* posttest and follow up scores were significantly predicted by the *DEERS* pretest score. Students with higher *DEERS* pretest scores reported higher *DEERS* scores at both posttest and follow up. *DEERS* follow up test score was also significantly predicted by race. Students who identified as African American, Caucasian, or Hispanic/Latino were significantly more likely to report higher *DEERS* scores at follow up compared to those who identified as another racial group (e.g. American Indian or Asian). Treatment group, sex, parent education, and pre-test score for *PSS-10*, *CES-DC*, *SCARED* GAD subset of items, or *PALS DB* did not significantly predict *DEERS* scores at posttest or follow up.

Table 17
DEERS Regression

	Posttest			Follow Up		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>P</i>
Treatment	2.655	4.003	0.507	1.697	3.971	0.669
<i>DEERS</i> Pretest Score	0.520	0.112	<0.001**	0.590	0.112	<0.001**
Sex	-3.092	4.350	0.477	2.006	4.309	0.642
African American	-2.828	8.124	0.728	25.745	8.564	0.003*
Caucasian	1.650	8.257	0.842	26.989	8.541	0.002**
Hispanic/Latino	1.027	8.141	0.900	19.991	8.763	0.023*
Parent Ed: less than HS	-5.516	6.564	0.401	-1.138	6.811	0.867
Parent Ed: HS grad	-2.537	5.269	0.630	-9.669	5.069	0.056
<i>PSS-10</i> pretest score	-0.181	0.461	0.695	0.679	0.449	0.131
<i>CES-DC</i> pretest score	0.367	0.289	0.203	-0.375	0.296	0.205
<i>SCARED</i> pretest score	0.305	0.646	0.637	0.833	0.657	0.205
<i>PALS DB</i> pretest score	0.018	0.467	0.969	0.098	0.460	0.832
	Intercept = 45.90			Intercept = -1.093		

* $p < .05$. ** $p < .01$.

Nonjudgmental, nonavoidant response and present moment awareness. The models accounted for 38% of the variance in *CAMM* posttest score $F(12, 68) = 71.77, p < .001, R^2 = .38$ and 42% of the variance in *CAMM* follow up score $F(12, 68) = 58.61, p < .001, R^2 = .42$. *CAMM* posttest scores were significantly predicted by *CAMM* pretest score and *SCARED GAD* subset of items pretest score. Students with higher *CAMM* pretest scores reported significantly higher *CAMM* scores at posttest. Students with lower *SCARED GAD* pretest scores reported significantly higher *CAMM* scores at posttest. *CAMM* follow up scores were significantly predicted by race and *SCARED GAD* pre-test score. Students who identified as Caucasian were significantly more likely to report lower *CAMM* scores at follow up compared to those who identified as Hispanic or another racial group. Treatment group, sex, parent education, and pretest score for *PSS-10, CES-DC or PALS DB* did not significantly predict *CAMM* scores at posttest or follow up.

Table 18
CAMM Regression

	Posttest			Follow Up		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Treatment	-0.932	1.601	0.561	-1.199	1.689	0.478
<i>CAMM</i> Pretest Score	0.424	0.142	0.003**	0.214	0.153	0.162
Sex	-2.903	1.761	0.099	-2.738	1.848	0.139
African American	-0.599	3.516	0.865	-6.704	3.543	0.058
Caucasian	-3.194	3.633	0.379	-7.788	3.470	0.025*
Hispanic/Latino	-3.186	3.609	0.377	-6.203	3.482	0.075
Parent Ed: less than HS	-0.963	2.620	0.713	-3.528	2.953	0.232
Parent Ed: HS grad	-0.486	2.049	0.813	-0.362	2.428	0.882
<i>PSS-10</i> pretest score	0.128	0.159	0.419	-0.301	0.181	0.095
<i>CES-DC</i> pretest score	-0.179	0.121	0.140	0.097	0.132	0.463
<i>SCARED</i> pretest score	-0.835	0.264	0.002**	-0.987	0.288	0.001**
<i>PALS</i> pretest score	-0.025	0.189	0.894	-0.243	0.227	0.285
	Intercept = 30.90			Intercept = 47.80		

* $p < .05$. ** $p < .01$.

Avoidance and Fusion. The models accounted for 38% of the variance in *AFQ-Y8* posttest score $F(12, 68) = 73.84, p < .001, R^2 = .38$ and 51% of the variance in *AFQ-Y8* follow up score $F(12, 68) = 45.79, p < .001, R^2 = .51$. *AFQ-Y8* posttest scores were significantly predicted by *AFQ-Y8* pretest score, *CES-DC* pretest score, and *SCARED* GAD pretest score. Students with higher *AFQ-Y8* pretest scores reported significantly higher *AFQ-Y8* scores at posttest. Students with higher *CES-DC* pretest scores reported significantly higher *AFQ-Y8* scores at posttest. Students with higher *SCARED* GAD pretest scores reported significantly higher *AFQ-Y8* scores at posttest. The *AFQ-Y8* follow up score was significantly predicted by *SCARED* GAD pre-test score. Students with higher *SCARED* GAD pre-test scores reported significantly higher *AFQ-Y8* scores at post-test. Treatment group, sex, race, parent education, and pre-test score for *PSS-10* or *PALS DB* did not significantly predict *CAMM* scores at posttest or follow up.

Table 19
AFQ-Y8 Regression

	Posttest			Follow Up		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Treatment	-0.334	1.406	0.812	0.381	1.593	0.811
<i>AFQ-Y8</i> Pretest Score	0.419	0.126	0.001**	0.299	0.154	0.053
Sex	0.880	1.492	0.555	3.102	1.689	0.066
African American	2.492	2.885	0.388	2.590	3.163	0.413
Caucasian	2.486	2.970	0.403	3.462	3.164	0.274
Hispanic/Latino	5.007	2.916	0.086	4.080	3.160	0.197
Parent Ed: less than HS	1.050	2.147	0.625	-0.610	2.669	0.819
Parent Ed: HS grad	-0.636	1.737	0.714	-1.400	2.207	0.526
<i>PSS-10</i> pretest score	-0.137	0.148	0.354	0.111	0.168	0.509
<i>CES-DC</i> pretest score	0.198	0.096	0.039*	-0.015	0.115	0.894
<i>SCARED</i> pretest score	0.594	0.216	0.006*	0.626	0.259	0.016*
<i>PALS DB</i> score	-0.158	0.153	0.301	0.161	0.196	0.411
	Intercept = 1.740			Intercept = -2.123		

* $p < .05$. ** $p < .01$.

Anxiety. The models accounted for 36% of the variance in *SCARED* GAD posttest score $F(11, 69) = 66.91, p < .001, R^2 = .36$ and 31% of the variance in *SCARED* GAD follow up score $F(11, 69) = 73.74, p < .001, R^2 = .31$. The *SCARED* GAD posttest score was significantly predicted by treatment group and *SCARED* GAD pretest score. Students with higher *SCARED* GAD scores at pretest had significantly higher *SCARED* GAD scores at posttest. Those who received the *L2B* treatment reported significantly higher *SCARED* GAD posttest scores than those who received the *SM&C* treatment.

SCARED follow up scores were significantly predicted by *SCARED* GAD pretest score, race, and *PSS-10* pretest score. Students with higher *SCARED* GAD scores at pretest reported significantly higher *SCARED* GAD scores at follow up. Caucasian students reported significantly higher *SCARED* GAD scores at follow up. Students with higher *PSS-10* pretest scores reported significantly higher *SCARED* GAD scores at follow up. Sex, parent education,

and pre-test score for CES-DC or *PALS DB* did not significantly predict *SCARED* GAD scores at posttest or follow up.

Table 20
SCARED Regression

	Posttest			Follow Up		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Treatment	1.720	0.827	0.038*	-0.451	0.741	0.543
<i>SCARED</i> Pretest Score	0.583	0.130	<0.001**	0.641	0.121	<0.001**
Sex	0.431	0.875	0.622	1.427	0.806	0.077
African American	-1.040	1.554	0.503	1.312	1.434	0.360
Caucasian	0.873	1.612	0.588	3.083	1.464	0.035*
Hispanic/Latino	0.539	1.549	0.728	1.089	1.433	0.447
Parent Ed: less than HS	-0.100	1.266	0.937	1.565	1.209	0.196
Parent Ed: HS grad	0.231	1.053	0.826	1.924	0.995	0.053
<i>PSS-10</i> pretest score	0.092	1.078	0.242	0.148	0.071	0.036*
<i>CES-DC</i> pretest score	0.068	0.057	0.234	-0.018	0.054	0.737
<i>PALS DB</i> pretest score	-0.060	0.093	0.5718	0.029	0.089	0.746
	Intercept = -1.427			Intercept = -4.928		

* $p < .05$. ** $p < .01$

Depression. The models accounted for 31% of the variance in *CES-DC* posttest score $F(11, 69) = 81.70, p < .001, R^2 = .31$ and 32% of the variance in *CES-DC* follow up score $F(11, 69) = 74.31, p < .001, R^2 = .32$. The *CES-DC* posttest score was significantly predicted by the *CES-DC* and the *PSS-10* pretest scores. Students with higher *CES-DC* pretest scores reported higher *CES-DC* scores at posttest. Students with higher *PSS-10* pretest scores reported significantly higher *CES-DC* scores at posttest. The *CES-DC* follow up score was significantly predicted by *CES-DC* pretest score, race, and *PSS-10* pretest score. Students with higher *CES-DC* pretest scores reported higher *CES-DC* scores at follow up. African American and Caucasian students reported significantly higher *CES-DC* scores at follow up compared to Hispanic/Latino or students of other races. Students with higher *PSS-10* pretest scores reported significantly higher *CES-DC* scores at follow up. Treatment group, sex, parent education, and

pre-test score for SCARED GAD subset of items or *PALS DB* did not significantly predict *CES-DC* scores at posttest or follow up.

Table 21
CES-DC Regression

	Posttest			Follow Up		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Treatment	-2.328	1.600	0.146	-0.887	1.956	0.650
<i>CES-DC</i> Pretest Score	0.474	0.112	<0.001**	0.376	0.150	0.012*
Sex	-0.609	1.688	0.718	2.091	2.090	0.317
African American	-1.345	3.203	0.675	7.936	3.797	0.037*
Caucasian	-1.773	3.205	0.580	7.820	3.913	0.046*
Hispanic/Latino	-0.582	3.233	0.857	6.666	3.878	0.086
Parent Ed: less than HS	-0.346	2.597	0.894	-1.308	3.285	0.691
Parent Ed: HS grad	-2.557	2.138	0.232	-0.615	2.731	0.822
<i>PSS-10</i> pretest score	0.344	0.152	0.024*	0.684	0.189	<0.001**
<i>SCARED</i> pretest score	0.235	0.252	0.351	0.171	0.330	0.603
<i>PALS DB</i> pretest score	-0.170	0.181	0.348	-0.031	0.232	0.894
	Intercept = 8.654			Intercept = -11.715		

* $p < .05$. ** $p < .01$.

Academic Efficacy. The models accounted for 66% of the variance in *Academic Efficacy* (*PALS AE*) posttest score $F(12, 68) = 31.68, p < .001, R^2 = .66$ and 52% of the variance in *PALS AE* follow up score $F(12, 68) = 43.34, p < .001, R^2 = .52$. *PALS AE* posttest scores were significantly predicted by *PALS AE* and *SCARED* GAD pretest scores. Students with higher *PALS AE* pretest scores reported higher *PALS AE* scores at both posttest and follow up. Students with higher *SCARED* GAD pretest scores reported higher *PALS AE* scores at posttest. *PALS Academic Efficacy* follow up score was also significantly predicted by treatment group, sex, parent education, *PSS-10*, *CES-DC*, and *SCARED* GAD pretest scores. Students who received the *L2B* treatment reported significantly higher *PALS AE* follow up scores than those who received the *SM&C* treatment. Females reported higher *PALS AE* scores at follow up. Students whose parents who did not complete high school reported significantly lower *PALS AE* scores at

follow up. Students with lower *PSS-10* pretest scores reported higher *PALS AE* scores at follow up. Students with higher *SCARED* GAD and *CES-DC* scores at pretest reported higher *PALS AE* scores at follow up. Race and *PALS DB* did not significantly predict *PALS AE* scores at posttest or follow up.

Table 22
PALS AE Regression

	Posttest			Follow Up		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>P</i>
Treatment	2.559	1.321	0.053	1.925	0.932	0.039*
<i>PALS AE</i> Pretest Score	0.407	0.158	0.010*	0.370	0.115	0.001**
Sex	1.052	1.456	0.470	-2.033	1.009	0.044*
African American	1.228	3.338	0.713	1.348	2.041	0.509
Caucasian	0.603	3.276	0.854	0.494	1.965	0.801
Hispanic/Latino	4.301	3.352	0.200	3.165	2.055	0.124
Parent Ed: less than HS	-1.522	2.142	0.477	-3.387	1.602	0.034*
Parent Ed: HS grad	-1.484	1.728	0.391	-1.301	1.336	0.330
<i>PSS-10</i> pretest score	-0.219	0.132	0.097	-0.358	0.089	<0.001**
<i>CES-DC</i> pretest score	-0.025	0.102	0.806	0.210	0.076	0.006**
<i>SCARED</i> pretest score	0.492	0.229	0.032*	0.364	0.174	0.036*
<i>PALS DB</i> pretest score	-0.065	0.150	0.667	0.177	0.116	0.127
	Intercept = 5.597			Intercept = 12.400		

* $p < .05$. ** $p < .01$.

Disruptive Behavior. The models accounted for 67% of the variance in *PALS Disruptive Behavior (PALS DB)* posttest score $F(11, 69) = 28.49, p < .001, R^2 = .67$ and 34% of the variance in *PALS DB* follow up score $F(11, 69) = 59.04, p < .001, R^2 = .34$. *PALS DB* posttest scores were significantly predicted by only the *PALS DB* pretest score. Students with higher *PALS DB* pretest scores reported higher *PALS DB* scores at both posttest and follow up. *PALS DB* follow up scores were also significantly predicted by race. Students who identified as African American and Caucasian reported significantly higher *PALS DB* scores at follow up than Hispanic/Latino students or students of other racial groups. Treatment group, sex, parent

education, and pre-test score for *PSS-10*, *CES-DC*, or *SCARED* GAD subset of items did not significantly predict *PALS DB* scores at posttest or follow up.

Table 23
PALS DB Regression

	Posttest			Follow Up		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Treatment	0.650	0.996	0.514	-0.369	0.783	0.637
<i>PALS DB</i> Pretest Score	0.414	0.113	<0.001**	0.768	0.083	<0.001**
Sex	0.678	1.110	0.541	-0.665	0.838	0.427
African American	-0.596	2.449	0.808	4.014	1.564	0.010*
Caucasian	0.718	2.440	0.768	3.148	1.570	0.045*
Hispanic/Latino	-1.232	2.507	0.623	1.013	1.570	0.519
Parent Ed: less than HS	-0.820	1.636	0.616	-0.033	1.257	0.979
Parent Ed: HS grad	-2.374	1.383	0.086	-0.014	0.999	0.988
<i>PSS-10</i> pretest score	-0.094	0.101	0.349	0.011	0.089	0.902
<i>CES-DC</i> pretest score	0.013	0.074	0.858	0.063	0.075	0.403
<i>SCARED</i> pretest score	0.044	0.161	0.784	-0.288	1.147	0.050
		Intercept = 6.489		Intercept =	1.738	

p* < .05. *p* < .01.

Latent Growth Models

When creating the linear growth models, the slope was set as -6 to 0, so that the intercept would represent the end of treatment, which is the point in time of most interest in this study for all the dependent variables. Nonlinear basis and quadratic models were also fit to evaluate for non-linear change. Because those models either did not converge or did not fit better than the linear models, only the results from the linear growth models are reported below. See Figures 1-4 for path diagrams of the models. Note that stars (*) in the path diagrams of the Figures represent fixed model parameters as opposed to indicating statistical significance as they do in Tables 15-22. The same covariates were used in the growth models that were entered into the regression models.

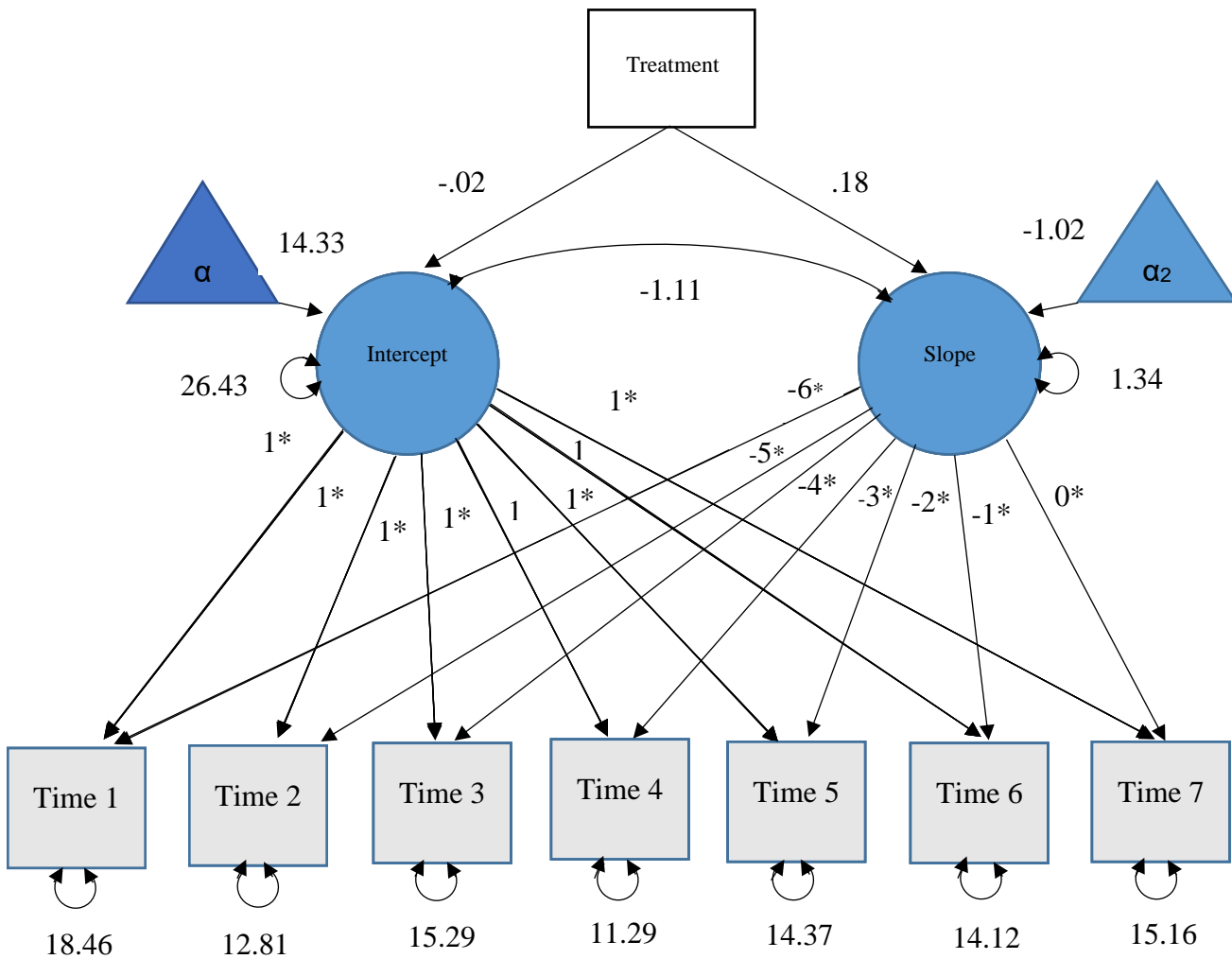
The RMSEA, SRMR, CLI and TFI are fit indices used to determine the fit of the growth models. The RMSEA is “an absolute fit index scaled as a badness-of-fit statistic where a value of zero indicates the best result” (Kline, 2016, p. 273). An RMSEA value of less than .05 indicates close fit, an RMSEA value between .05 and .1 indicates not close fit, and an RMSEA of greater than .10 indicates poor fit (Kline, 2016). The SRMR is also an absolute fit index that is a badness-of-fit statistic. The SRMR is a “measure of the mean absolute correlations residual, the overall difference between the observed and predicted correlations” (Kline, 2016, p. 277). Values of SRMR > .1 indicate poor fit (Kline, 2016). The Bentler CFI is an incremental fit index that is also a goodness-of-fit statistic. “The CFI compares the amount of departure from close fit for the researcher’s model against that of the null model” (Kline, 2016, p. 276). A CFI of .90 “says that the fit of the researcher’s model is about .90, or 90% better than the baseline model” (Kline, 2016, p. 276). Its values range from 0 to 1.0 where 1.0 is an exact fit. A related statistic is the Tucker-Lewis Index (TLI) which is highly correlated with the CFI and value of 1.0 represents exact fit.

Stress. Structural Equation Modeling was used to create a latent growth curve to address the hypothesis that participants in both the mindfulness and active control interventions will show decreases in stress (as measured by *PSS-10* score) over the course of the interventions (from pretest to posttest). The linear growth curve fit indices revealed acceptable fit $\chi^2(71) = 93.598, p = .037, CFI = .949, TLI = .935, RMSEA = .063, SRMR = .075$. See Figure 1 for a path diagram of the model. The mean of the intercept indicates the average score for self-reported stress at posttest when all predictors are zero was 14.332 ($SE = 7.126$) on the *PSS-10*. The variance of the intercept was 26.430 indicating a wide variability in posttest measures of stress across the participants. The mean of the linear slope was -1.024 ($SE = 1.800, p = .570$) indicating

overall non-significant change in stress between each time point when both the treatment and control conditions were analyzed together. The regression of treatment on the slope was an estimate of 0.180, $p = 0.646$, revealing no significant difference in changes in *PSS-10* scores of the treatment group compared to the control group. The regression of treatment predicting the intercept was an estimate of -0.018, $p = .991$. Regressions of the intercept and slope on covariates were all nonsignificant.

Figure 1

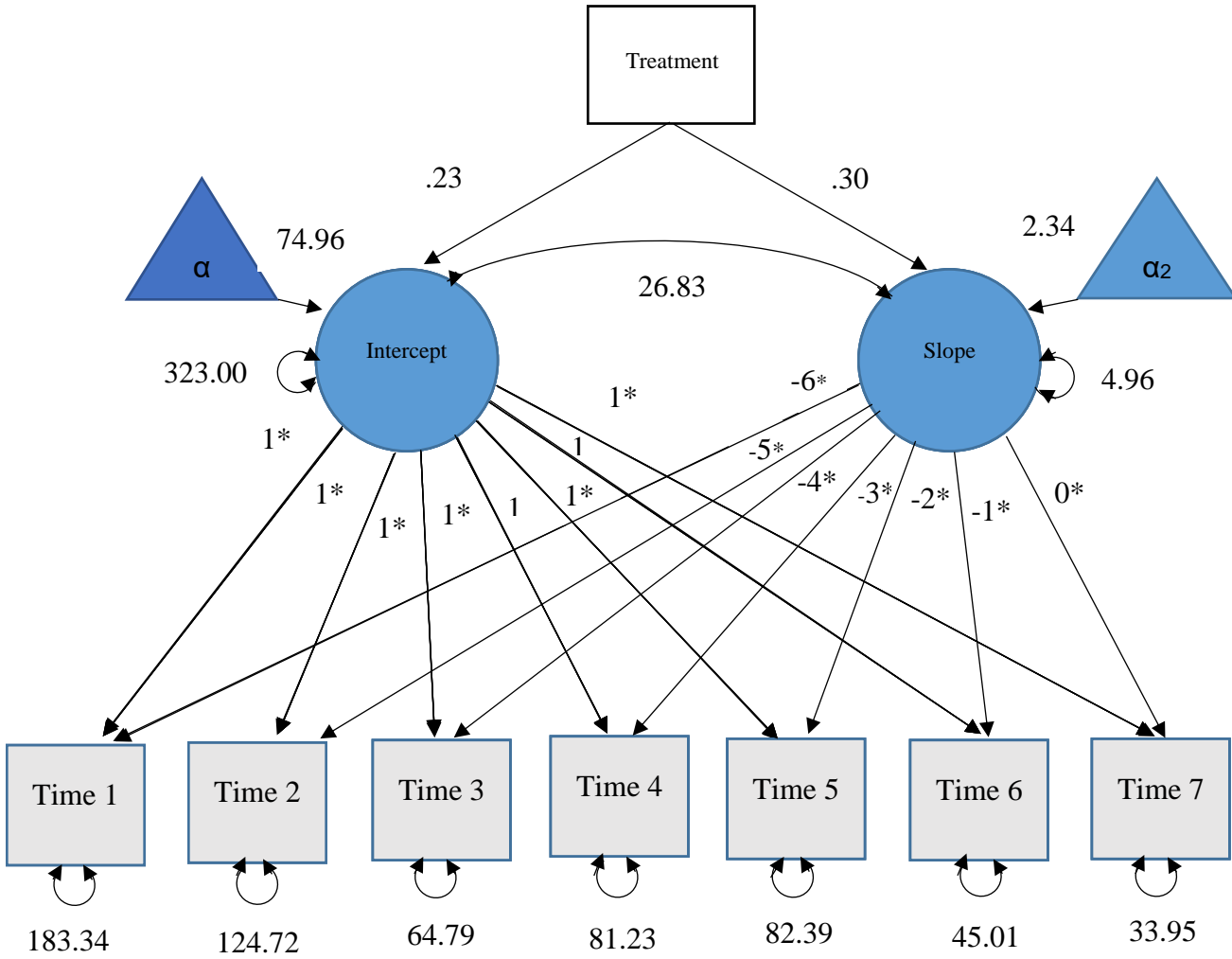
PSS-10 Growth Model



Emotional Regulation. Structural Equation Modeling was used to create a latent growth curve to address the hypothesis that participants in the mindfulness intervention will show increases in the development of emotional regulation compared to the active control condition. When creating the linear growth model, the slope was set as -6 to 0 in a similar fashion to the stress model. The linear growth curve fit indices revealed acceptable fit $\chi^2(78) = 114.788$, $p = .004$, CFI = .938, TLI = .922, RMSEA = .077, SRMR = .041. See Figure 2 for a path diagram of the model. The mean of the intercept indicates the average score for self-reported difficulties in emotional regulation on the *DEERS* at posttest when all the predictors are set a zero was 74.961 ($SE = 14.507$). The variance of the intercept was 323.001 indicating an extreme variability in posttest *DEERS* scores across the participants. The mean of the linear slope was 2.344 ($SE = 2.216$, $p = .29$) indicating overall there were non-significant changes in difficulties in emotion regulation between each time point when both the treatment and control conditions were analyzed together. The regression of treatment on the slope was an estimate of 0.304 ($p = .68$) revealing no significant difference in changes in *DEERS* scores of the treatment group compared to the control group. The regression of treatment predicting the intercept was an estimate of 0.226, $p = .962$. Regression of the slope on the *PSS-10* pretest score was significant with an estimate of -0.15 ($p = .047$). Regressions of the intercept and slope on all other covariates were nonsignificant.

Figure 2

DEERS Growth Model

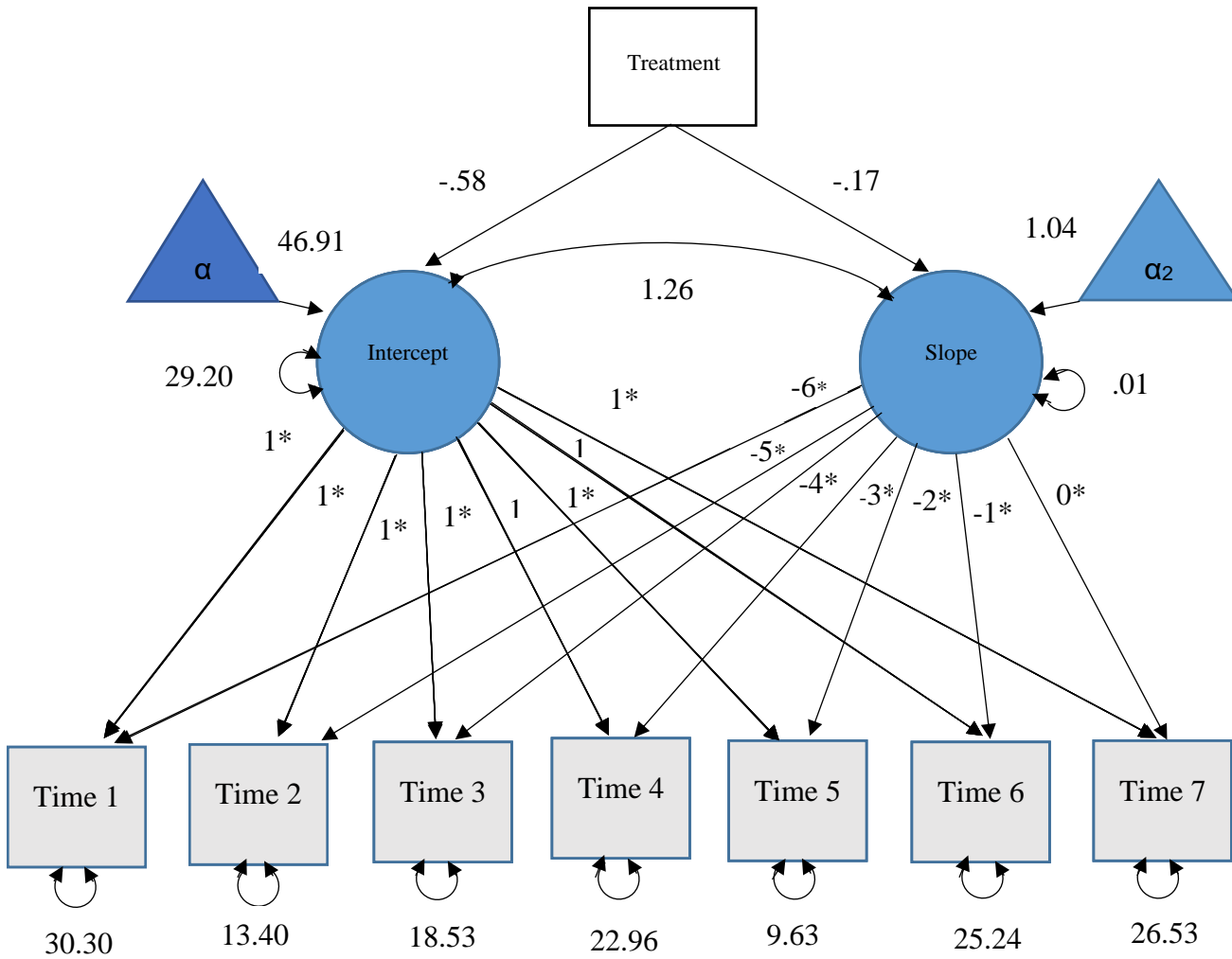


Nonjudgmental, nonavoidant response and present moment awareness. Structural Equation Modeling was used to create a latent growth curve to address the hypothesis that participants in the mindfulness intervention will show an increase in mindfulness mechanisms of nonjudgmental, nonavoidant response and present moment awareness, as measured by increases in scores on the *CAMM*, over the course of the interventions (from pretest to posttest). With the

slope set as -6 to 0, the linear growth curve fit indices revealed a significant chi square and fit indices indicating mediocre model fit $\chi^2(78) = 137.111, p < .001, CFI = .880, TLI = .849, RMSEA = .097, SRMR = .084$. See Figure 3 for a path diagram of the model. The mean of the intercept indicates the average score of self-reported mindfulness at posttest when all the predictors are set to zero was 46.910 ($SE = 5.198$) on the *CAMM*. The variance of the intercept was 29.196 ($SE = 7.599$) indicating a very wide variability in posttest *CAMM* scores across the participants. The mean of the linear slope was 1.042 ($SE = 0.810, p = .199$) indicating non-significant change in mindfulness between each time point when both the treatment and control conditions were analyzed together. The regression of treatment on the slope was an estimate of -.168 ($SE = .259, p = .516$) revealing no significant difference in changes in *CAMM* scores of the treatment group compared to the control group. The regression of treatment predicting the intercept was an estimate of -0.580, $p = .731$. Regression of the intercept on the *SCARED* GAD pretest score was significant with an estimate of -1.089 ($p < .001$). Regression of the slope on the *SCARED* pretest score was also significant with an estimate of -0.117 ($p = .007$). Regressions of the intercept and slope on all other covariates were nonsignificant.

Figure 3

CAMM Growth Model

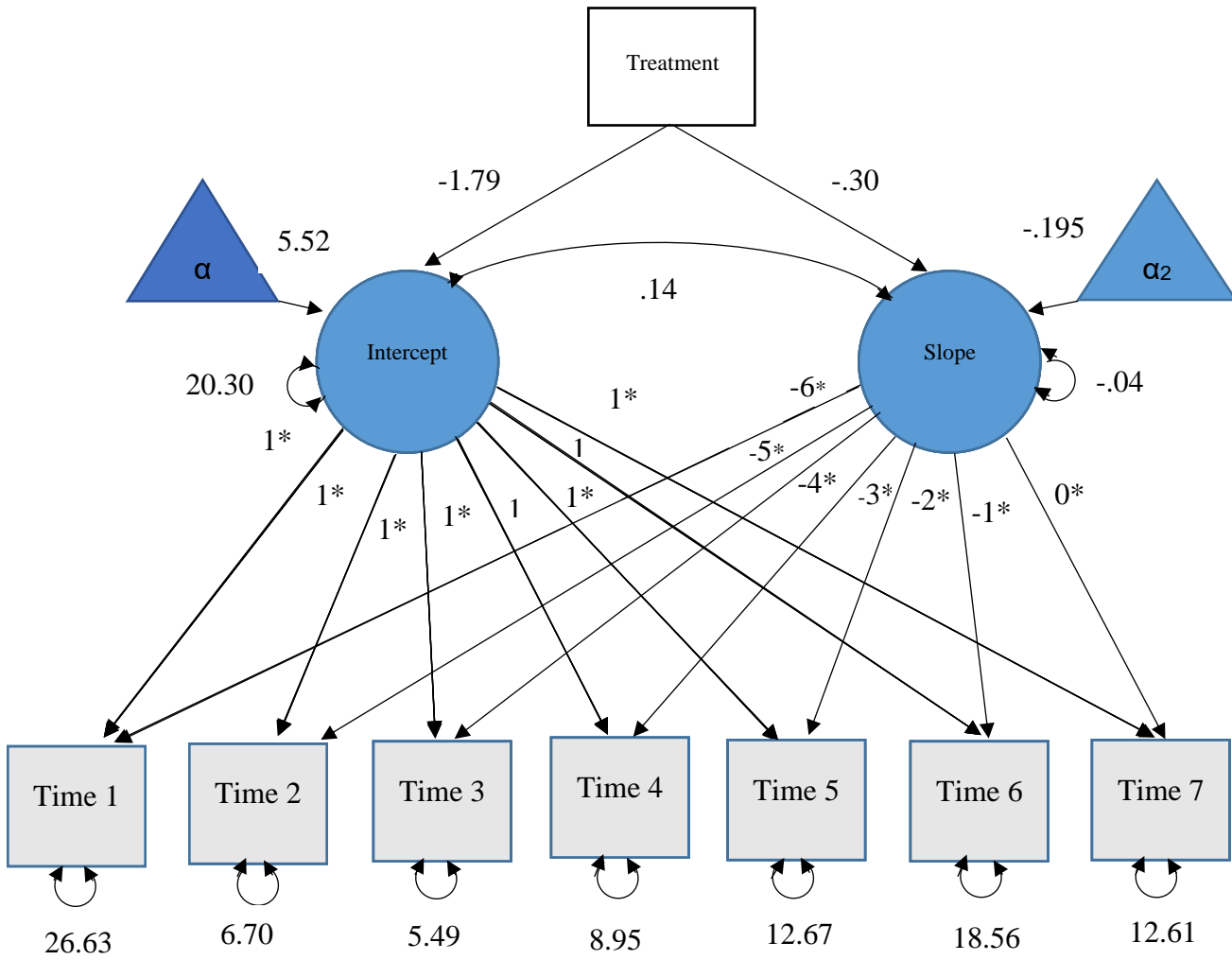


Avoidance and fusion. Structural Equation Modeling was used to create a latent growth curve to address the hypothesis that participants in the mindfulness intervention will show a decrease in avoidance and fusion, as measured by decreases in scores on the *AFQ-Y8*, over the course of the interventions (from pretest to posttest). The linear growth curve fit indices revealed significant chi square which suggests the model does not fit well $\chi^2(78) = 151.373, p < .001$, CFI

= .873, TLI = .840, RMSEA = .108, SRMR = .083. See Figure 4 for a path diagram of the model. The mean of the intercept indicates the average *AFQ-Y8* score at posttest when all the other predictors are zero was a score of 19.657 ($SE = 1.476$). The variance of the intercept was 51.904 indicating a wide variability across the participants was present at posttest on the *AFQ-Y8*. The mean of the linear slope was 0.333 ($SE = .564, p = .554$) indicating nonsignificant decreases in self-reported *AFQ-Y8* scores between each time point when both the treatment and control conditions were analyzed together. The regression of treatment on the slope was an estimate of $-.301$ ($SE = .200, p = .133$) indicating no significant difference in changes in *AFQ-Y8* scores of the treatment group compared to the control group. The regression of treatment predicting the intercept was an estimate of $-1.791, p = .202$. Regression of the intercept on the *SCARED* GAD pretest score was significant with an estimate of $.742$ ($p = .001$). Regression of the slope on the *CES-DC* pretest score was also significant with an estimate of 0.033 ($p = .013$). Regressions of the intercept and slope on all other covariates were nonsignificant.

Figure 4

AFQ-Y8 Growth Model



CHAPTER IV: DISCUSSION

Feasibility/Fidelity

Facilitators indicated both programs seemed important, they were comfortable with implementation, and overall students seemed to like the programs which supported that it is feasible for graduate students to implement these programs in a high school. The fidelity results demonstrated that both a mindfulness based curriculum and alternate stress management and coping curriculum can both be implemented with acceptable and comparable fidelity as a part of health and physical education enhanced curriculum. Therefore, the first research hypothesis was supported as there was not a significant difference in treatment fidelity of the two programs.

Difficulties with implementation within school settings across programs included behavior management of the students in large groups. Implementation of mindfulness, which often asks for quiet and concentration, is especially difficult in larger groups of teenagers when only a few disruptive students can largely disturb the experience. Additionally, school interruptions including school announcements and competing activities can also distract from the content. Facilitator feedback also indicated that some of the adolescents had difficulty grasping the abstract content and the large group format did not allow for much in terms of checks for comprehension of either program. Consideration of the use of pre-existing use of classroom management techniques, of the behavioral functioning of students prior to implementation, and of teacher buy in and accountability for participating are important regarding success with managing behavior of the students during implementation of these programs in large groups. Use of behavioral reinforcement programs can maximize student engagement with programs in large groups. However, they are often not included in program curriculums and can be considered a deviation from program content/extraneous concepts. The benefits of accessing

large numbers of students in a natural environment needs to be weighed against the challenges regarding fidelity of implementation for these types of programs.

The order of the themes is also a factor that was suggested by facilitators to consider regarding future implementation of mindfulness programs. It seems logical to place body awareness first because it has concrete exercises (e.g. body scan), though other themes appeared easier to grasp and body awareness may make more sense after students have experienced other aspects of mindfulness that are more intuitive (emotion, tenderness). Adolescent responses to other mindfulness programs that have the concepts introduced in a different order may provide an interesting comparison to the *L2B* program.

Lack of home practice completion was also a significant factor that interfered with fidelity with the programs. The way the fidelity checks were constructed, the gross lack of home practice by most of the students was not accurately reflected in the fidelity data. Time was spent on problem solving barriers to home practice completion with students; however, lack of follow through on home practice activities from students continued without ability for recourse. In large groups, there was less opportunity for motivational interviewing or other techniques for increasing fidelity with home practice. It is suspected that lack of home practice may account for some lack of efficacy found in this implementation *L2B* treatment program. A potential remedy suggested by teachers in future implementations was to include home practice completion as a part of course grades.

Acceptability

The second research hypothesis was also supported in that there were not significant differences in the acceptability of the two programs according to students, teachers, or

administrators. Teachers reported both satisfaction with implementation of the programs and that the programs were important for students to receive. Teachers rated they were neutral regarding feeling comfortable with implementing the program themselves, though the teacher ratings indicated the *SM&C* program as more likely to be implemented in the future. This suggests that teachers feel more prepared and confident in their ability to implement more traditional stress and coping approaches and it would take significantly more training for teachers to implement mindfulness programming in the schools. Feedback across programs was the suggestion to include movement and hands on content as much as possible as opposed to lecture.

Administrator feedback indicated the principal was satisfied with both programs and viewed both programs as important for students to receive. No concerns with future implementations of either programs were noted. The principal indicated he was likely to support future implementation of the *L2B* program while he indicated he was very likely to support implementation of the *SM&C* program, indicating administration may choose stress management and coping over mindfulness programming if only one program was to continue in the future.

Most students responded the program was at least slightly important and there were not significant differences in students between groups of reports of perceptions lasting value, importance, overall usefulness, the programs' effect on school or general wellbeing, or whether they would recommend the program they received. More students responded the *L2B* program contributed to their general well-being and that they would recommend the program to others compared to the *SM&C* Program. In both programs, students tended to like the experiential practices rather than the in-class presentations and group discussions. Many students reported they did not practice at home across both conditions, which likely detracted from the efficacy of

both programs as research has shown that time spent engaging in practice of formal meditation is significantly related to development of mindful mechanisms (Carmody & Baer, 2008).

Efficacy

The third hypothesis that the mindfulness intervention would show increased effects on the psychological outcomes (stress, emotional regulation, anxiety, and depression) of high school students compared to the active control condition was not supported. There were not significant differences between treatment and active control groups in student reported stress, overall difficulties in emotional regulation, or symptoms of depression between groups at posttest or follow up.

A significant difference in anxiety was found in that participation in the *SM&C program* predicted significantly lower posttest *SCARED* GAD scores compared to the *L2B* condition after accounting for pretest score as well as other demographic factors as well as pretest levels of stress, depression, and disruptive behavior. Treatment group predicted anxiety at posttest but not at follow up, indicating this effect was not maintained over time. It is possible that some of the mindfulness exercises were anxiety provoking for students in the mindfulness condition as contact with their inner experience may have been unfamiliar and uncomfortable for some of the students. There is a chance that as mindfulness grows, one becomes more aware of one's own internal state and therefore internal struggle is more apparent to oneself, so there is a tendency to rate oneself higher in terms of anxiety.

The most consistent predictor of psychological outcomes at posttest and follow up was previous functioning in that area. Additionally, students with higher *PSS-10* pretest scores reported significantly higher *CES-DC* scores at post test and higher *SCARED* GAD scores at

follow up supporting the theory that high levels of stress can lead to depressive and anxious symptoms in adolescents.

The fourth hypothesis that mindfulness intervention would show increased effects on the academic efficacy and reduction of disruptive behavior of the high school students compared to the active control condition was partially supported. Participation in the *L2B* condition buffered decreases in academic efficacy scores on the *PALS Academic Efficacy* subtest at follow up compared to the active control condition. The *L2B* program's increased effect on academic self-efficacy of the students may be explained by the *L2B* acceptability feedback that included students' reports that the *L2B* program helped them cope with stress related to school and pay attention/listen/focus. Additionally, the Tenderness component of the *L2B* program emphasized how students can be kind to themselves and others and when asked for examples, many students identified that studying and doing homework was a way to be kind to themselves. This is an important finding given the context of implementation of the *L2B* program in a school setting, as while the *L2B* program did not perform better on other psychological measures, the *L2B* program did outperform the *SM&C* program on academic self-efficacy, which is a measure that may be most aligned with student learning and goals of the educational setting. There was not a significant difference in disruptive behavior of students across conditions which is why the fourth hypothesis was only partially supported.

The fifth hypothesis was not supported. Participants in the mindfulness intervention did not show significant changes in the development of mechanisms of mindfulness compared to the active control condition. There were not significant differences in development of mechanisms of mindfulness (nonjudgmental response and present moment awareness or fusion and experiential avoidance) between programs. One hypothesis for the lack of difference between

groups is that although efforts were made to decrease the mindfulness content associated with yoga, perhaps elements from yoga had some effect on the mindfulness of students in the active control condition. Another hypothesis is that as students became aware of the concepts of mindfulness and fusion, they rated themselves differently on the assessments over time.

The sixth hypothesis that stress and difficulties in emotion regulation would decrease in both groups over the course of the intervention was not supported. The linear model best fit the data and indicated non-significant changes in stress and difficulties in emotion regulation were found when both conditions were analyzed together which is inconsistent with the corresponding hypothesis.

The programs were implemented over a six-week period of 45 minutes twice weekly. It may be that more time may have added to the effects of the interventions. Additionally, the low homework completion of many of the students likely detracted from the efficacy of the intervention. The amount of practice that a mindfulness based program has introduced to its participants has been found to be one of the most important factors in variation of findings across studies, in that the amount of practice (i.e. the intensity of the intervention) has accounted for 52% of the variance in effect sizes in controlled studies and 21% of the variance in pre-post design studies (Zenner, Herrnleben-Kurz, & Walach, 2014). Increases in mindfulness mechanisms have been shown to mediate the relationship between practice and improvement in psychological functioning (Carmody & Baer, 2008). This suggests that without home practice, mindfulness mechanisms will be slower to increase, and thus, wellbeing would be less likely to improve. Additionally, mindfulness can be difficult to measure and perhaps there were small changes in mindfulness that developed but were not captured via paper surveys of the

adolescents. Future research would be well served to implement computer based questionnaires and to incorporate additional measurements of mindfulness as well as other outcome variables.

Limitations

Internal validity

History. The timing of the interventions may have factored into the outcomes of the study because the last measurement (posttest) happened right before the holiday break. The temporal proximity to the holidays as well as the fact that exams were taking place as soon as the student participants returned from break may have led to differences in stress in the students as compared to when the interventions started in mid-October. Perhaps results may have been different if the interventions would have been delivered during a different six-week period of the school year.

Testing. Many participants complained about having to fill out repeated measurements with paper and pencil and it is suspected participant fatigue may have impacted responses. Efforts were made to filter out data that was clearly suspect; however, it is still possible that some data was included that was biased due to repeated testing and participant fatigue. Electronic gathering of information and fewer items may have yielded more accurate results.

Instrumentation. Items may have taken on different meanings to participants because of the social context at different given points in time. A response shift may have changed the students' internal standards of measurement over the course of the interventions. For example, prior to the intervention, many students were not aware of the concepts of mindfulness or defusion and therefore may have completed the initial *CAMM* and *AFQ-Y8* differently before they became aware of the meaning of these terms. It is plausible that as students gained awareness of these aspects of their lives over the course of the mindfulness intervention, they

became increasingly aware of their lack of awareness and the intensity of their fusion. Thus, they may have rated themselves differently in these areas simply because of becoming aware of them and now see themselves differently relative to these constructs.

Selection bias. Students had already been assigned to classes by the school so random assignment to conditions was not possible. Attempts were made to account for this; however, the class variables tended to confound with other variables (sex, race) despite attempts to account for this by assigning classrooms to treatment groups based on these factors, and thus class variables were not ultimately included in the analyses. No differences were found in t-tests and in initial analyses when class dummy variables were included; however, ultimately the nested nature of the data could not be fully accounted for.

Attrition. Participants exited the study over time due to reasons including moving away or choosing to drop out of the study. The statistical procedure of FIML was used to handle missing data, which assumes data is missing at random and computes a likelihood for each case based on the observed data and uses variables in the model to recover missingness. However, it is still unclear if FIML could fully account for the participants who dropped out of the study because they did not receive the full treatment.

Combination of selection and other threats. Students may have been grouped into classes because of commonalities with other classes and it is unknown the extent that events from other classes may have had on the students in each condition comparatively.

Diffusion of treatment. Both the treatment group and the active control group participated in the yoga program at the request of the school. It is possible that students in the active control group made gains in aspects of mindfulness because of their participation of yoga.

The yoga curriculum intentionally omitted overt references to mindfulness, but there some aspects of mindfulness in yoga that cannot be removed (e.g. present moment awareness) and overlap with mindfulness nonetheless. Additionally, students talk to each other between classes and some participants were close friends with participants in the contrasting condition and therefore may have shared some of the aspects of the programs with each other. The need to use behavioral treatment components in both conditions also made the two curriculums more similar compared to not using the behavioral components.

External validity

Sample characteristics. This research was conducted with ninth-grade, mostly low socioeconomic status students in a rural high school; thus, the generalizability of the results is limited to participants with similar demographics in similar settings.

Stimulus characteristics and setting. Conducting these interventions in schools, especially the mindfulness based intervention, is a relatively novel approach. Students often associate the school context with academic tasks and may have reacted to the program differently if it had been delivered in a clinical or community setting. Additionally, grades were not dependent on participation, and there was no parent involvement after initial consent was received. For these reasons, some students may not have taken the programs as seriously. Using the school setting was considered an asset as many students received the intervention; however, in some respects the contrast to what most students expect to be doing in school used in these types of approaches may have limited some students' engagement with the programs. External validity was also limited in this study because graduate students were implementing the programs in the schools, which makes the results less generalizable to other situations in high

schools where there is not access to graduate students who have studied and participated in mindfulness training.

Reactivity of experimental arrangement and assessment. Students were aware they were participating in a research study. The requirement of completion of hand written surveys coupled with the intervention may have produced a reaction to the experience that was different, and perhaps more negative, than if the interventions would have been delivered alone without the surveys.

Timing of measurement. The fact that many of the instruments were utilized weekly may have influenced the student responses compared to if the instruments would have only been implemented at pretest, posttest, and follow up. The weekly administrations allowed the ability to model growth of the proposed underlying mechanisms over time; however, the repeated measurements limit the generalizability of results to studies with similar implementation of weekly surveys.

Construct validity

Attention and contact with participants. The two different conditions had different facilitators. Only one facilitator implemented programs in both conditions and the other four facilitators were assigned to one program each because of scheduling and familiarity and experience with mindfulness. All facilitators were doctoral level students in a pediatric school psychology program; although, there were varying levels of experience between the facilitators. It is possible that there were effects specific to the facilitators that influenced the differences between groups.

In addition, there was no condition to compare outcomes in students who received class as usual so is not possible to know outcomes would have been without intervention. It is possible

that if the student who received *L2B* would have been compared to students who received class as usual, they would have shown less stress compared to the class as usual group. It is plausible that both interventions were helpful in simply maintaining levels of stress and preventing rises in stress that could have yielded increased risk for negative outcomes. It is plausible that a no-treatment control group may have yielded increased negative outcomes if no intervention would have been provided.

Content validity. A major limitation of this study was that all the data on student stress was gathered only via student self-report. Gathering additional measurements of outcome variables via teacher and parent report would have increased the content validity of the measurements. For example, the school principal commented on qualitative feedback forms that “Students coming out of Health and PE have been much calmer in their next class” and “Our ninth-grade students have actually had less discipline incidents compared to previous ninth grade cohorts”. If these types of outcomes had been included quantitatively in addition to the student self-report, content validity for the outcome variables would have been strengthened. No inclusion of teacher or parent input on outcome measures was a major limitation in this study.

Statistical conclusion

Low statistical power. Conclusions based on statistical analysis were weakened in this study due to the lower than anticipated number of participants. It was originally estimated that 125 students would participate in the study. However, for students to participate, it was required that they return a parental consent form and provide their own assent. Many students simply did not return the forms with their parent signature and therefore received the intervention but did not participate in the study. Due to a lower number of participants than anticipated, the probability of rejecting the null hypothesis and finding differences between groups was lowered.

A post hoc power analysis conducted with G*power 3.0.10 (Faul, Erdfelder, Lang, & Buchner, 2007) indicated that this study was underpowered (.576) to detect a medium effect size (Cohen's $d = .5$). A sample size of 64 participants in each treatment group would have increased the power to .8 and given an 80% chance that the study would detect a medium effect size. It is possible that if the study had more power, more differences between the groups may have been detected.

Variability in procedures. Whole classroom instruction may also have limited the effectiveness of the curriculum at times compared to if the same programs would have been implemented with the same students in smaller groups. While the exercises were completed, classes of twenty to thirty students compromised the integrity of the interventions at times because of behavioral disturbances. There were occasions when students were disruptive or uncooperative and interrupted those students who wanted to engage across both conditions. This was especially noticeable during the mindfulness treatment when remaining quiet is especially important. The stance was taken that students could opt out of participating if they remain quiet and show respect for their fellow students, as consistent with the *L2B* curriculum, however adolescents easily influenced each other and this social influence likely changed the behavior of some students who may have otherwise participated.

The facilitators had engaged in rehearsal of the curriculums with piloting of the program in small groups of four to five students; however, their use with large groups had not been piloted, so problems with student engagement with the curriculum occurring in large groups of students were novel to the facilitators. Attempts were made to facilitate engagement in larger classroom settings; however, it is unknown the degree to which these factors may have negated the effectiveness of the content. Small group practice where students who are referred and

invested and cooperative, and individual issues could be addressed more directly, may have increased the effectiveness of the programs.

Participant heterogeneity. Students in this study varied among many dimensions including sex, race, and clinical status, among others. The impact of treatment and performance on the dependent measures may have been influenced by these factors and made them less likely to detect a difference in response to each of the programs.

Unreliability of the measures. The *PSS-10* has been validated numerous times with college students and adults and has been used in studies with adolescents due to its easy readability; however, it has not been validated in adolescent populations. It is likely that a measure initially developed to measure adolescent stress and validated with that population may have yielded more valid results. Additionally, the prompt of “in the past month” was changed to “in the past week” for the weekly assessments. This prompt leads adolescents to reflect over the past week and the resulting responses may have been different than if the adolescents would have been asked for a snapshot measure of stress of that day.

Sensitivity to change. Most of the measures utilized in this study had high test retest reliability, which lends itself to lower sensitivity to change. It is plausible that choosing measures that have higher sensitivity to change over time would have led to increased ability to detect changes in responses of participants.

Implications for Research and Practice

The results of this study can be useful for public health planning in schools and in the community. Adolescence is a tumultuous and difficult time often wrought with psychological stress and the transition from middle school to high school can be particularly difficult as new expectations, increased social pressures, and heightened awareness of the pressure and stress of

emerging adulthood all converge. Strategies for effectively handling difficult internal experiences are not readily available and mindfulness exposure and practice offers one potentially beneficial approach that may be relatively easily incorporated into standard health and PE curriculums. Mindfulness-based interventions in adolescence have the potential to address heightened stress levels apparent during this difficult time; however, the effectiveness of mindfulness-based interventions in schools is an emerging field. The scope of studies looking specifically at adolescents transitioning into high school is minimal and more research aimed at reducing stress and enhancing adaptive self-regulation is needed with this population.

The wide variability of responses to the programs suggests that future research should strive to identify factors that predict students who best respond to the mindfulness curriculums and target those students specifically with the interventions. Future research could further evaluate if students with internalizing problems respond differently than students externalizing problems or no significant problems to these types of programs in school. If specific factors can be identified that predict increased response, these students could be referred for specific interventions that best fit their specific strengths and needs. Other more functional indicators of adolescent success are also important to consider in choosing students to participate and evaluating participant response to the programs in future studies (e.g. discipline data and grades).

Future studies should emphasize the importance of the roles of the teachers and their buy in with the content of stress reduction programming. It is imperative that school administration and other stakeholders support teachers' dedication to their role during the programs. Some type of pre-determined, structured flow of communication about teacher involvement during the programs is recommended to enhance feedback to teachers and administration and allow for problem solving to occur given any obstacles.

The use of pre-existing classroom management is also an important consideration when planning to implement these programs. Ideally, some type of structured classroom management plan would already exist so that students would only be introduced to program content instead of both classroom management and program content simultaneously. If classroom management is poor in a classroom, implementing the behavior management plan as a first phase before the mindfulness or stress reduction program may have more optimal outcomes.

Teachers and stakeholders are encouraged to consider the use of attendance and participation in all aspects of program (both didactic, experiential, and exercise related) towards course grades. Emphasizing participation in yoga or any exercise aspect of the program that is complimentary is also critical. Counting attendance and class participation, as well as completion of home practice and workbook materials towards grades would have teachers more involved and invested in whether the students are completing these activities and would likely increase their value to both teachers and students alike. Future research should consider how dosage of the program affects outcomes and evaluate response to the program given different lengths and amounts of home practice and attendance.

Future research should also consider potential for participant fatigue and opt for computer administration of self-report measures with adolescents when possible as many adolescents tend to prefer use of electronics to paper and pencil administrations. This would also lead to increased ease of scoring and analysis of the data. Additionally, the interventions were only six weeks in length and it is possible that longer intervention time or follow up/booster sessions are needed to make a more significant and lasting impact on the students in Tier 1/large group formats. Variability in outcomes related to level of facilitator training in mindfulness and

experience with the specific program would be another aspect of implementation that could be addressed with further research.

More emphasis is needed on the development of Tier 1 programs designed to facilitate social and emotional development of high school students. Additional research on these types of programs that can be implemented at a relatively low cost while simultaneously demonstrating benefits may increase the use of these types of programs in schools. Stakeholders including administrators, teachers, school support staff, parents, and community leaders should be educated on the critical developmental period of adolescence and the potential benefits of prevention programs that can be implemented in schools. To improve the quality of these programs as Tier I interventions, future research should ensure effective classroom management is in place, provide more training to teachers regarding the importance of their roles, incorporate more movement, and shorten didactic aspects of the programs.

Focus may also shift from implementing these stress reduction programs in whole classrooms as a part of Tier I to implementation of these program in small groups as a part of Tier II interventions within schools' Multi-Tiered System of Supports frameworks. Tier II interventions are designed to enhance skills of youth who are identified as at-risk for development of problems are often implemented in smaller groups during the school day. Future studies may find more success with an interventionist to student ratio of six to eight students. Smaller groups would yield more time to address individual student comprehension, home practice adherence, and questions, enhance relationships and rapport between students and facilitators, and reduce risk of behavior problems during the didactic portion of the program. In smaller groups, it would be more feasible to collect parent and teacher reports and monitor discipline reports to provide additional measures of important outcomes for the adolescents.

This study's findings suggest that the *L2B* program was about as effective as implementing the standard stress management guidelines for teens from the American Academy of Pediatrics (2015) in enhancing school Health and PE curriculums but cannot comment on the efficacy of *L2B* program compared to no intervention at all. This study highlights that mindfulness programs can be challenging to implement with adolescents in large groups in school settings and that considerable planning is needed to minimize disruption and facilitate effective delivery.

Schools may opt to use these research findings and adopt stress reduction and mindfulness based interventions as a part of the range of supports offered to students in the effort to reduce stress and maximize student outcomes. Overall, mindfulness and stress management and coping programs appear feasible and acceptable as Tier I programs with high school students.

Qualitatively, many students reported benefits from the programs. A wide range of variability existed in response to the programs, though overall efficacy was found to be lower than hypothesized in this study. Very few studies have compared an active control group and used nonclinical populations as this study did. A promising finding was that the mindfulness intervention buffered decreases in academic efficacy of the students compared to the alternate approach; however, this result needs to be replicated in future studies. Addressing the previously mentioned limitations of this study may prove to demonstrate more efficacious results for these types of programs in high schools in future studies, especially given this study's recommendations for future research in this area.

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Appendix A

IRB Approval



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
4N-70 Brody Medical Sciences Building · Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · www.ecu.edu/irb

Notification of Initial Approval: Expedited

From: Social/Behavioral IRB
To: [Leigh Patterson](#)
CC: [Jeannie Golden](#)
[Leigh Patterson](#)
Date: 10/13/2016
[UMCIRB 16-001350](#)
Re: School-Based Stress Reduction with Young Adolescents as an Enhanced Health and PE curriculum

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) is for the period of 10/9/2016 to 10/8/2017. The research study is eligible for review under expedited category # 7. The Chairperson (or designee) deemed this study no more than minimal risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The Investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Name	Description
There are no items to display	
Acceptability - Administrator Evaluation L2B.docx	Surveys and Questionnaires
Acceptability - Administrator Evaluation SM&C.docx	Surveys and Questionnaires

Acceptability - Student Evaluation L2B.docx	Surveys and Questionnaires
Acceptability - Student Evaluation SM&C.docx	Surveys and Questionnaires
Acceptability - Teacher Evaluation L2B.docx	Surveys and Questionnaires
Acceptability - Teacher Evaluation SM&C.docx	Surveys and Questionnaires
AFQ8.docx	Surveys and Questionnaires
AFQ-Y Pre and Post.docx	Surveys and Questionnaires
Assent.doc	Consent Forms
CAMM.docx	Surveys and Questionnaires
CAMM_weekly.docx	Surveys and Questionnaires
CES-DC.docx	Surveys and Questionnaires
Demographics form - parent.docx	Surveys and Questionnaires
Demographics form - parent.docx	Data Collection Sheet
Demographics form - student.docx	Surveys and Questionnaires
Demographics form - student.docx	Data Collection Sheet
DERS weekly.docx	Surveys and Questionnaires
DERS.docx	Surveys and Questionnaires
Facilitator Feedback form L2B.docx	Surveys and Questionnaires
Facilitator Feedback form SM&C.docx	Surveys and Questionnaires
Fidelity - L2B week 1.docx	Surveys and Questionnaires
Fidelity - L2B week 2.doc	Surveys and Questionnaires
Fidelity - L2B week 3.doc	Surveys and Questionnaires
Fidelity - L2B week 4.doc	Surveys and Questionnaires
Fidelity - L2B week 5.docx	Surveys and Questionnaires
Fidelity - L2B week 6.docx	Surveys and Questionnaires
Fidelity - SM&C week 1.docx	Surveys and Questionnaires
Fidelity - SM&C week 2.docx	Surveys and Questionnaires
Fidelity - SM&C week 3.docx	Surveys and Questionnaires
Fidelity - SM&C week 4.docx	Surveys and Questionnaires
Fidelity - SM&C week 5.docx	Surveys and Questionnaires
Fidelity - SM&C week 6.docx	Surveys and Questionnaires
LP Dissertation Proposal 9_14_16.docx	Study Protocol or Grant Application
PALS - AE and DB.docx	Surveys and Questionnaires
Parent Cover Letter.docx	Consent Forms
Parent Cover Letter.docx	Recruitment Documents/Scripts
Parent Permission Form.docx	Consent Forms
PSS_10_item.doc	Surveys and Questionnaires
PSS_10_item_weekly.doc	Surveys and Questionnaires
SCARED.docx	Surveys and Questionnaires

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

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Appendix B

Stress Management and Coping Curriculum

Dates	Theme and coping strategy	Session Content	Home practice
Week 1	Understanding Stress and Relaxation Coping: deep breathing	Session 1	Session 1
		1. Introduction and rationale	1. Identify times you can relax
		2. Class Guidelines /Poster -Positive Ways to Cope with Stress	
		3. What is stress?	2. use the stress management techniques handout to help with practicing a relaxation technique daily
		4. What causes stress?	
		5. How does the body handle stress?	
		6. Handout – Stress Mgmt Techniques – Deep Breathing	
		7. Home practice discussion	
		8. Closing relaxation practice (DB)	
		Session 2	
		9. Opening relaxation practice (DB)	
		10. Review of previous lesson	
		11. Is stress always bad?	
		12. If stress is a survival tool, why does it make us feel awful?	
		13. How do people deal with stress?	
		14. Dealing with Stress -discussion and visual model	
		15. Review	Session 2: Use a relaxation technique daily
16. Home Practice invitation			
17. Closing relaxation practice (DB)			
Week 2	Identifying and Addressing Problems Coping: PMR	Session 3	Session 3
		1. Opening relaxation practice (DB)	1. Practice relaxation exercise once daily.
		2. Review of lessons and check in about out of class practice complete reflection	2. finish the stress management plan stressor identification worksheet
		3. Identify and then address the problem	
		4. My Stress Management Plan worksheet	
		5. Discuss how to avoid stress when possible	
		6. Stress Mgmt Techniques: PMR	
		7. Home practice invitation	
8. Closing relaxation practice (PMR)	Session 4		
Session 4			
1. Opening relaxation practice (PMR)	1. practice relaxation once daily		
2. Discuss letting some things go	2. Use the time management tips worksheet to help you practice time management this week		
3. Stressors and responses worksheet			
4. Time management tips handout and discussion			
5. Home practice invitation			
6. Closing relaxation practice (PMR)	3. write about your practice of time management in your journal		
Week 3	Taking Care of my Body	Session 5	Session 4
		1. Opening relaxation practice (PMR)	1 practice relaxation once daily.

	Coping: Guided Imagery	<ol style="list-style-type: none"> 2. Review lessons and check in with out of class practice (reflections) 3. Stress Management techniques - physical activity 4. Stress Mgmt Techniques: guided imagery 5. Home practice invitation 6. Closing relaxation practice (GI) 	<ol style="list-style-type: none"> 3. make a plan to exercise this week
		<p>Session 6</p> <ol style="list-style-type: none"> 1. Opening relaxation practice (GI) 2. Importance of Nutrition education 3. Choose my plate handout 4. Discuss Eating Well 5. Importance of sleep education 6. Discuss Sleeping Well 7. Home practice invitation 8. Closing relaxation practice (GI) 	<p>Session 6</p> <ol style="list-style-type: none"> 1. Make one dietary change this week 2. Get an extra hour of sleep this week 3. Practice relaxation daily
Week 4	Taking Care of Thoughts and Emotions Coping: journaling and listening to music	<p>Session 7</p> <ol style="list-style-type: none"> 1. Opening relaxation practice (GI) 2. Review lessons and check in with out of class practice (reflections) 3. Introduce and discuss problem focused vs. emotion focused coping 4. Discuss taking Instant Vacations 5. Journaling for cognitive and emotional processing 6. Home practice invitation 7. Closing relaxation practice (Journaling) 	<p>Session 7</p> <ol style="list-style-type: none"> 1. practice instant vacations 2. practice relaxation daily
		<p>Session 8</p> <ol style="list-style-type: none"> 1. Opening relaxation practice (journaling) 2. Review lessons and check in with out of class practice (reflections) 3. Discuss ways to release emotional tension 4. Express yourself creatively activity (art, music, poetry) 5. Music for relaxation 6. Home practice invitation 7. Closing relaxation practice listening to music and journaling 	<p>Session 8</p> <ol style="list-style-type: none"> 1. Express yourself creatively 10 minutes daily this week 3. practice relaxation daily
Week 5	Taking Care of Relationships	<p>Session 9</p> <ol style="list-style-type: none"> 1. Opening relaxation practice: listening to music and journaling 2. Review lessons and check in with out of class practice (reflections) 3. DEARMAN interpersonal skill worksheet 4. Discuss how helping others can make the world, and the way you feel, better 5. Home practice invitation 6. Closing relaxation practice 	<p>Session 9</p> <ol style="list-style-type: none"> 1. practice relaxation daily 3. refer to the DEARMAN worksheet and identify one situation that you could benefit from using DEARMAN skills 3. help someone this week

		<p>Session 10</p> <ol style="list-style-type: none"> 1. Opening relaxation practice 2. Review Lessons and check in with out of class practice (reflections) 3. Discuss When to Turn for Help 4. Types of social support – identify sources and types of support available to you 5. Stress-management techniques – talking about it 6. Home practice invitation 7. Closing relaxation practice 	<p>Session 10</p> <ol style="list-style-type: none"> 1.Practice using social supports 2.Practice relaxation daily
Week 6	Taking practices into daily life	<p>Session 11</p> <ol style="list-style-type: none"> 1. Opening relaxation practice 2. Review lesson and check in with out of class practice (reflections) 3. Review of stress, definitions, and effects on the problem 4. Review tackling the problem 5. Deep breathing practice 6. Review taking care of my body 7. Home practice invitation 8. Closing relaxation practice (deep breathing or PMR) 	<p>Session 11</p> <ol style="list-style-type: none"> 1.Continue to practice relaxation and stress management skills daily
		<p>Session 12</p> <ol style="list-style-type: none"> 1. Opening relaxation practice (deep breathing or PMR) 2. Review lessons and check in with out of class practice (reflections) 3. Review of taking care of emotions 4. Guided imagery practice 5. Review of taking care of relationships 6. Gifts (wallet cards of positive ways to cope with stress handout) 7. Invitation to continue with practices 8. Closing relaxation practice – listening to music and journal about incorporating these concepts in the future 	<p>Session 12</p> <p>Continue to practice relaxation and stress management skills daily</p>

Appendix C

Fidelity Forms

L2B Teacher Rating Scale- Revision 7- B Theme: Week 1

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle; yoga mats or cushions may be available, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with mindfulness practice, includes activities and discussion, and ends with mindfulness practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
✓ <i>Introduction and rationale for program</i>		
✓ <i>Introductory Class Practice (for second B lessons)</i>		
✓ <i>Class Guidelines & Poster Letter</i>		

✓ <i>Mindful Listening Activity</i>		
✓ <i>Definition of mindfulness with discussion of components: attention on purpose, present moment, without judgment/self-compassion.</i>		
✓ <i>My Mindful/Mindless Life (Workbook page)</i>		
✓ <i>Mindful Eating (or Sense Door, etc.)</i>		
✓ <i>Basic breath awareness</i>		
✓ <i>Body Scan</i>		
✓ <i>Homework discussion</i>		
✓ <i>Mindfulness in My Life (Home Practice)</i>		
✓ <i>Mindful Dots</i>		
✓ <i>Person Just Like Me –B theme</i>		
<ul style="list-style-type: none"> • Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes. 		

L2B Teacher Rating Scale- Revision 7- R Theme: Week 2

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle; yoga mats or cushions may be available, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with mindfulness practice, includes activities and discussion, and ends with mindfulness practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
<ul style="list-style-type: none"> ✓ <i>Opening mindfulness practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Review of B lesson(s) and check in about out-of-class practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Transition to lesson on thoughts</i> 		

✓ <i>Big Event</i>		
✓ <i>Name that thought</i>		
✓ <i>My Mind is a Cast of Characters</i>		
✓ <i>Polar Bear (Sticky Thoughts)</i>		
✓ <i>Mindfulness of Thoughts Practice</i>		
✓ <i>Homework invitation and instructions</i>		
✓ <i>Person Just Like Me -R</i>		
<ul style="list-style-type: none"> • Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes. 		

L2B Teacher Rating Scale- Revision 7- E Theme: Week 3

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle; yoga mats or cushions may be available, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with mindfulness practice, includes activities and discussion, and ends with mindfulness practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
<ul style="list-style-type: none"> ✓ <i>Opening mindfulness practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Review of B lesson(s) and check in about out-of-class practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Transition to lesson on emotions</i> 		

✓ <i>Cross the line</i>		
✓ <i>How does it feel?</i>		
✓ <i>Emotions in Three Acts</i>		
✓ <i>The Great Cover Up</i>		
✓ <i>Surfing the Waves</i>		
✓ <i>Mindfulness of Emotions Practice</i>		
✓ <i>Finding the Feeling</i>		
✓ <i>Homework invitation and instructions</i>		
✓ <i>Person Just Like Me –E</i>		
<ul style="list-style-type: none"> • Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes. 		

L2B Teacher Rating Scale- Revision 7- A Theme: Week 4

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle; yoga mats or cushions may be available, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with mindfulness practice, includes activities and discussion, and ends with mindfulness practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
<ul style="list-style-type: none"> ✓ <i>Opening mindfulness practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Review of other lesson(s) and check in about out-of-class practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Transition to lesson on stress and attention</i> 		

✓ <i>Differences between chronic and acute stress</i>		
✓ <i>A Stressed out Case</i>		
✓ <i>Cross the line</i>		
✓ <i>How much can you handle?</i>		
✓ <i>What's my limit?</i>		
✓ <i>What's the best balance?</i>		
✓ <i>Memo from the Body-Mind</i>		
✓ <i>Mindfulness 360</i>		
✓ <i>Mindful Movement</i>		
✓ <i>Mindful Walking</i>		
✓ <i>Person Just Like Me -A</i>		
<ul style="list-style-type: none"> • Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes. 		

L2B Teacher Rating Scale - Revision 7- T Theme: Week 5

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle; yoga mats or cushions may be available, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with mindfulness practice, includes activities and discussion, and ends with mindfulness practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
<ul style="list-style-type: none"> ✓ <i>Opening mindfulness practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Review of other lesson(s) and check in about out-of-class practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Transition to lesson on practicing kindness and meanness; paragraph from Brantley</i> 		
<ul style="list-style-type: none"> ✓ <i>Neuroplasticity and practice</i> 		

✓ <i>Ways we take care/don't take care of ourselves</i>		
✓ <i>Stream of Gratitude</i>		
✓ <i>Loving Kindness practice</i>		
✓ <i>Invitation to Home Practice</i>		
✓ <i>A Person Just Like Me - T</i>		
<ul style="list-style-type: none"> • Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes. 		

L2B Teacher Rating Scale - Revision 7- H Theme: Week 6

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle; yoga mats or cushions may be available, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with mindfulness practice, includes activities and discussion, and ends with mindfulness practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
<ul style="list-style-type: none"> ✓ <i>Opening mindfulness practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Review of other lesson(s) (building inner strength) and check in about out-of-class practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Transition to lesson on taking practices into daily life</i> 		
<ul style="list-style-type: none"> ✓ <i>Short practices (review of previously learned practices)</i> 		

✓ <i>Designed to Re-MIND</i>		
✓ <i>Breathe beading activity</i>		
✓ <i>“What I wish for myself” letter</i>		
✓ <i>Mindful Quilt</i>		
✓ <i>Closing Circle (Mindful Speaking and Listening)</i>		
✓ <i>A Person Just Like Me - H</i>		
✓ <i>Gifts (Wallet Cards, etc.)</i>		
<ul style="list-style-type: none"> • Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes. 		

Stress Management and Coping Program Fidelity: Week 1

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with a relaxation practice, includes activities and discussion, and ends with relaxation practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
✓ <i>Introduction and rationale for program</i>		
✓ <i>Introductory Class Practice (for second class of the week)</i>		
✓ <i>Class Guidelines & Poster Positive Ways to Deal with Stress</i>		
✓ <i>What is stress?</i>		
✓ <i>What causes stress?</i>		

✓ <i>How does the body handle stress?</i>		
✓ <i>Stress Management Techniques handout – Part 1 (Deep Breathing)</i>		
✓ <i>Is stress always bad?</i>		
✓ <i>If stress is a survival tool, why does it make us feel awful?</i>		
✓ <i>How do people deal with stress?</i>		
✓ <i>Stress Management Techniques handout – Deep Breathing</i>		
✓ <i>Discussion of home practice</i>		
• Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes.		

Stress Management and Coping Program Fidelity: Week 2

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with a relaxation practice, includes activities and discussion, and ends with relaxation practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
✓ <i>Opening relaxation practice</i>		
✓ <i>Review of lessons and check in about out of class practice</i>		
✓ <i>Transition to lessons on identifying and addressing stressors</i>		

✓ <i>Introduce My Stress-Management Plan Worksheet</i>		
✓ <i>Discuss strategies to avoid stress when possible</i>		
✓ <i>Discuss letting some things go</i>		
✓ <i>Introduce Stressors and Responses worksheet</i>		
✓ <i>Time Management Tips handout and discussion</i>		
✓ <i>Home practice instructions</i>		
<ul style="list-style-type: none"> • Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes. 		

Stress Management and Coping Program Fidelity: Week 3

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with a relaxation practice, includes activities and discussion, and ends with relaxation practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
✓ <i>Opening relaxation practice</i>		
✓ <i>Review of lessons and check in about out of class practice</i>		
✓ <i>Transition to Lessons on Taking Care of My Body</i>		
✓ <i>Stress Management Techniques Handout - physical activity</i>		
✓ <i>Active Relaxation: Guided Visualization</i>		

✓ <i>Importance of nutrition and healthy eating education</i>		
✓ <i>Choose My Plate handout</i>		
✓ <i>Discuss Eating Well</i>		
✓ <i>Importance of sleep and healthy sleep habits education</i>		
✓ <i>Discuss Sleeping Well</i>		
✓ <i>Home practice instructions</i>		
<ul style="list-style-type: none"> • Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes. 		

Stress Management and Coping Program Fidelity: Week 4

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with a relaxation practice, includes activities and discussion, and ends with relaxation practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
✓ <i>Opening relaxation practice</i>		
✓ <i>Review of lessons and check in about out of class practice</i>		
✓ <i>Transition to Lessons on Taking Care of Thoughts and Emotions</i>		
✓ <i>Introduce and discuss problem focused vs. emotion focused coping skills</i>		
✓ <i>Discuss Instant Vacations</i>		

✓ <i>Journaling for processing thoughts and emotions</i>		
✓ <i>Discuss Ways to Release Emotional Tension</i>		
✓ <i>Creative Expression Activity</i>		
✓ <i>Music for relaxation</i>		
✓ <i>Home practice instructions</i>		
<ul style="list-style-type: none"> • Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes. 		

Stress Management and Coping Program Fidelity: Week 5

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with a relaxation practice, includes activities and discussion, and ends with relaxation practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
<ul style="list-style-type: none"> ✓ <i>Opening relaxation practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Review of lessons and check in about out of class practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Transition to Lessons on Taking Care of Relationships</i> 		

✓ <i>Asking for what I want or refusing a request: DEAR MAN interpersonal skill worksheet</i>		
✓ <i>Discuss how Helping Can Make Your World -And the Way You Feel Better</i>		
✓ <i>Discuss when to turn for help</i>		
✓ <i>Types and sources of social support</i>		
✓ <i>Stress Management Techniques Handout: Talking about it</i>		
✓ <i>Home practice instructions</i>		
• Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes.		

Stress Management and Coping Program Fidelity: Week 6

DOMAINS	Score	Notes
1. Planning, Organization & Coverage of Session Curriculum		
<ul style="list-style-type: none"> The setting is conducive to the class (e.g. room is simple and neatly arranged; chairs are arranged in a circle, etc.). 		
<ul style="list-style-type: none"> Materials are prepared in advance to facilitate the flow of the lesson (e.g. handouts and writing materials are available and easily accessible). 		
<ul style="list-style-type: none"> Class follows a three-part structure (begins with a relaxation practice, includes activities and discussion, and ends with relaxation practice). 		
<ul style="list-style-type: none"> Individual elements of the lesson are taught in the correct order so that the logic of the lesson develops in a meaningful way. 		
<ul style="list-style-type: none"> Activities and practices are presented clearly, accurately and in accordance with the instructions in the curriculum. Teacher demonstrates understanding of the lesson themes and the rationale for each. 		
<ul style="list-style-type: none"> ✓ <i>Opening relaxation practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Review of lesson and check in about out of class practice</i> 		
<ul style="list-style-type: none"> ✓ <i>Review of stress definitions, causes, and effects on the body</i> 		
<ul style="list-style-type: none"> ✓ <i>Review of identifying and addressing problems</i> 		

✓ <i>Deep breathing practice</i>		
✓ <i>Review of Taking Care of My Body</i>		
✓ <i>Progressive Muscle Relaxation Practice</i>		
✓ <i>Review of Taking Care of Thoughts and Emotions</i>		
✓ <i>Guided Imagery Practice</i>		
✓ <i>Review of Taking Care of Relationships</i>		
✓ <i>Gifts (wallet cards, etc.)</i>		
✓ <i>Listen to music and journal about how to incorporate these concepts into future</i>		
• Extraneous concepts, ideas or activities of personal interest are not introduced but teacher may include relevant personal examples of the themes.		

