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MINDFULNESS AND RELAXATION TRAINING DELIVERED IN A
HIGH SCHOOL**

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EFFECTIVENESS AND MECHANISMS OF CHANGE OF MINDFULNESS AND
RELAXATION TRAINING DELIVERED IN A HIGH SCHOOL

A dissertation submitted in partial fulfillment
of the requirements for the degree of

DOCTOR OF PSYCHOLOGY

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ST. JOHN'S UNIVERSITY

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by

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ABSTRACT

EFFECTIVENESS AND MECHANISMS OF CHANGE OF MINDFULNESS AND RELAXATION TRAINING DELIVERED IN A HIGH SCHOOL

Lana Tenaglia

This study addresses the lack of research on the effectiveness of two major treatments for an adolescent sample. Both mindfulness and relaxation training are two major interventions that can be utilized to improve symptomology for aggression, disruptive behavior, anxiety, depression, perceived stress, as well as for the improvement of self-concept and academic performance. The focus of this study is to compare the effectiveness of mindfulness and relaxation training in a non-clinical sample of adolescents. It was hypothesized that the participants in the mindfulness group would have greater decreased levels in all facets assigned with the exception of self-concept and academic performance which would increase than the relaxation training and control groups. The participants in the relaxation training group were hypothesized to have a greater change than the control group. The present study also aimed to assess whether the underlying mechanisms of mindfulness and relaxation training were cognitive and physiological, respectively. Participants were student volunteers from general education classes at a public high school. They were randomly assigned to a mindfulness treatment, relaxation training, or inactive control group. Participants were given outcome measurements pre- and post-treatment to evaluate the impact of these interventions on anxiety, disruptive behavior, depression, stress, and self-concept. The participants in the

treatment groups were also given measures to assess the underlying mechanisms of both mindfulness and relaxation training. At two-month follow-up they were asked if their academic performance had improved since beginning the study, but the follow-up was ultimately dropped due to low sample size. The results yielded no significant difference between relaxation training, mindfulness, and the inactive control for depression, anxiety, anger, disruptive behavior, stress, and self-concept. Further, the results yielded no significant difference in the underlying mechanisms of mindfulness of relaxation training. Although the current study yielded no significant results, this study emphasizes the importance of utilizing effective treatments and the implementation of brief treatments for adolescents.

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I would like to dedicate this dissertation to my mother, Lynn Volosevich. Thank you for always making education a pertinent part of my childhood to inspire me to be the best I can be. I really could never thank you enough for your endless love and support in everything I have chosen to do. You have truly been a role model and have made me the woman I am today.

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Chapter 1: Introduction

As individuals emerge into adolescence, they meet major changes in their emotional and cognitive functioning. During this phase, there is a rise in stress and psychological disorders including anxiety and depression (Romeo, 2017). A meta-analysis concluded that across 27 countries from every world region, 13.4% of children and adolescents suffer from a mental disorder, the most common being anxiety disorders affecting 117 million children and adolescents. Relatedly, disruptive behavior disorders and depressive disorders affect 113 million and 47 million children and adolescents, respectively (Polanczyk et al., 2015). Furthermore, the number of major depressive episodes among adolescents increased from 8.7% in 2005 to 11.3% in 2014 (Mojtabai et al., 2016).

The need for treatments has become more pertinent in recent years due to this increase in the prevalence of psychopathology in adolescence. To address the growing number of adolescents in need of treatment, both mindfulness and relaxation training have been utilized to treat these various psychopathologies (Sharma et al.2017).

The applicability of meditation exercises to school settings is also a topic that needs more exploration (Britton et al., 2014) as there is a growing number of mentally ill students and not enough practitioners to address these concerns. In a systematic review of meditation implementation in school systems, Waters et al (2015) found these previous studies failed to randomize subjects, provide a comparison between specific meditation practices, and identify a time-sensitive intervention which may be feasible to implement within the school system. Brief interventions have been utilized to treat various individuals with a range of psychopathologies, including PTSD (Possemato et al, 2016),

and anxiety (Chen et al, 2003). Pawlow, O'Neil, and Malcolm (2013) found that just 20 minutes of progressive muscle relaxation significantly reduced stress and anxiety in a sample of 20 adults. Chen et al. (2013) found practicing mindfulness for seven consecutive days reduced anxiety in an adult sample. Finally, Possemato et al (2016) found depression was decreased in an adult sample in just four weeks. Although these studies support the efficacy of brief mindfulness and relaxation training interventions, their studies only investigate adult samples. Exploring the effectiveness of brief interventions can be helpful in developing interventions for adolescents that can be integrated into the school curriculum.

This study proposed that a mindfulness intervention can be used to effectively treat adolescents because it is easy to implement and feasible to teach practitioners to administer the treatment with efficacy. The current study aimed to compare mindfulness to relaxation training and to identify whether or not mindfulness adds any therapeutic elements to classic treatments.

Chapter 2: Literature Review

Mindfulness

Mindfulness is described as “the awareness that emerges through paying attention on purpose, in the present moment, and in a non-judgmental way to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, pg. 145). It encompasses the idea that individuals can observe thoughts, feelings, and bodily sensations in the present moment with openness and acceptance (Kabat-Zinn, 2003). Kabat-Zinn (2003) explains the concept of acceptance as allowing oneself to experience the full range of emotional expression with awareness. Developed from the Buddhist traditions, the integration of mindfulness in Western psychological treatments has dramatically expanded in the last few decades (Kabat-Zinn, 2003). As mindfulness was adapted into Western psychology, its conceptualization changed from its original Buddhist roots (Kabat-Zinn, 2003). In traditional Buddhist mindfulness, it is the practiced reflection of impermanence, non-self, and suffering. Contrarily, the Western conceptualization of mindfulness places less emphasis on these facets. Western mindfulness focuses more on the awareness that encompasses one’s internal and external experiences (Keng et al., 2011). Adding to its place in Western psychology, modern psychologists have explained mindfulness through self-control theory. During mindfulness meditative exercises, elements of self-control are often utilized. For example, physical movement is kept to a minimum while attention is kept focused on a kinesthetic object, most commonly the breath. All such directives involve will or intention—that is, self-control. However, mindfulness differs from self-control, in that its goal is to create openness and awareness at all times, not just in response to impulses (Brown et al., 2007). Social psychologist, Dr. Ellen Langer, with

research psychologist Dr. Shelley Carson, endorsed mindfulness and discussed the benefits of mindfulness in their research (Carson & Langer 2006). They discussed how mindfulness theory posits that maintaining a flexible and open mindset is more beneficial than one which is judgmental and rigid. They then discuss how mindfulness by definition, encompasses a state of self-acceptance since the focus of mindful attention is on attention and present experience rather than self-evaluation and self-criticism (Carson & Shelley, 2006). Mindfulness is currently incorporated in various therapeutic practices including Mindfulness-Based Stress Reduction (Diaz-Gonzalez et al.,2018), Mindfulness-Based Cognitive Therapy (MacKenzie et al., 2018), Dialectical Behavioral Therapy (Perroud et al., 2012), and Acceptance and Commitment Therapy (Waters, 2018). By facilitating non-judgmental acceptance, these mindfulness-based interventions help clients alleviate intense emotional states and tolerate and cope with negative emotional states (Baer, 2003).

How does mindfulness function as an effective intervention? A wide range of theories have been proposed to identify the various cognitive mechanisms for change in mindfulness. The Monitor and Acceptance Theory (Isbel & Mahar, 2015) holds that better attention toward cognition and accepting one's experiences are the two main mechanisms for change within mindfulness. More specifically, attention monitoring involves ongoing awareness of present moments, sensory experiences, bodily sensations, and mental dialogue. The acceptance component in this theory requires the person to develop a mental attitude of nonjudgment, openness, and composure toward internal and external experiences (Isbel & Mahar, 2015).

Shapiro et al. (2006) found that in addition to attention, intention (meaning “on purpose”), acceptance, and attitudes were the core mechanisms for change. Kang et al. (2012) found attention to be the most crucial mechanism and found the other mechanisms were awareness, present moment focus, and nonjudgmental acceptance of thoughts and experiences. In their research, Holas and Jankowski (2013) theorized mindfulness only contains two mechanisms for change: attention and decentering (changes in perception of one’s internal experiences). Although many of the mechanisms overlap across theories, the field has yet to agree on a mechanisms that drive mindfulness interventions. However, as attention and awareness have been commonly found as mechanisms across theories, which will be the mechanisms focused on in the current study. The mechanisms for change in relaxation training and mindfulness interventions apparently differ as mechanisms of mindfulness are cognitive and relaxation training mechanisms are physiological. Therefore, it is important to research these interventions and the effect they may have on various psychopathologies.

Although the research supporting mindfulness is mixed, the current literature does support mindfulness as a protective characteristic during adolescence because those with higher degrees of mindfulness have healthier functioning and lower incidences of depression and anxiety (Pepping et al., 2016). Several meta-analytic studies have examined mindfulness-based interventions and their effect on depression (Metcalf and Dimidjian, 2014), anxiety (Vollestad et al., 2012), and aggression (Singh et al., 2016). Although research with adolescents is more limited than that with adults, studies show that mindfulness is effective in reducing depressive, anxiety, and externalizing symptoms

in adolescents as well (Beauchemin et al., 2008; Bogels et al. , 2008; Tan and Martin, 2015).

A wealth of research has explored the effectiveness of mindfulness on improving depression. In a review of 13 randomized controlled studies, all but one study reported significantly decreased depressive symptoms (Metcalf and Dimidjian, 2014). Further, research also supports that mindfulness is effective in reducing psychological distress and depressive symptomology in adolescent populations (Ames et al., 2014; Tan & Martin, 2015). Although these studies utilized appropriate measures and treatment methods, they were not without limitation. In their study, Ames et al. (2014) had a sample size of only seven subjects and lacked a control group. Therefore, although their intervention produced significant outcomes in reducing depression, it is difficult to conclude that their results are generalizable to the adolescent population given their small sample size and whether or not the changes in outcomes were genuinely due to the intervention as there was no control group to compare the treatment. Tan and Martin (2015) also utilized appropriate measures and treatments, but only provided the participants with self-report measures that might not have resulted in the most accurate measure of the participants' psychopathology. Further, they did not control for therapists' effects, as the same clinician conducted all group interventions.

The literature supports the use of mindfulness for individuals struggling with anxiety and the reduction of anxiety, tension, and worrying for those suffering from an anxiety disorder (Khusid, 2013; Vollestad et al., 2012). There is a lack of literature on the impact of mindfulness on reduction of anxiety in adolescents. One study by Anila and Dhanalakshimi (2016) found their mindfulness intervention resulted in a significant

decrease in anxiety among an adolescent sample of 150 students. The students in the sample reported an improved ability to identify their current negative feelings of anxiety and learn how to manage these feelings positively.

Mindfulness can be used as a treatment to help individuals to increase focus and attention under conditions that may trigger aggression (Singh & Soamya, 2016). However, the effectiveness of mindfulness-based interventions for adolescents has been met with mixed results. A systematic review of the literature on mindfulness and aggression demonstrates that many of the group studies on mindfulness and aggression with adolescents include methodological errors, such as the lack of a control group, although the single-subject studies showed strong support in reducing aggressive symptoms. Due to this variability in the research, the effectiveness of mindfulness-based interventions on aggression is a subject that requires further examination (Fix & Fix, 2013).

During adolescence, individuals undergo important developmental events that influence their stress levels and emotional states (Lau and Hue, 2011). Those with higher levels of mindfulness tend to experience lower levels of stress (Ciesla et al., 2012; Christopher & Gilbert, 2010). Furthermore, the research supports that dispositional mindfulness allows for individuals to enhance their ability to cope with everyday stressors, as well as more severe conditions of distress (Marks et al., 2010).

Self-concept is defined as an individual's set of beliefs about his/herself. It often encompasses a person's physical, social, and emotional views of themselves (Garn et al., 2012). The formation of self-concept in adolescence often represents a good predictor of positive health outcomes and long-term self-perceptions (Garn et al., 2012). Mindfulness

is believed to be linked to self-concept, as mindfulness encourages understanding into the nature of the self (Hanley & Garland, 2017; Vago & Silbersweig, 2012). Little research has appeared in this area with an adolescent population. However, one study demonstrated that mindfulness leads to greater identity clarity in adolescents (Yang et al., 2017). Due to its focus on attention and awareness, it is likely that mindfulness will be an effective intervention in promoting self-concept. Mindfulness brings attention and awareness of one's internal and external experiences. When practicing mindfulness exercises, this internal attention and awareness will likely bring attention to the self and promote self-acceptance, as Carson and Langer (2006) posited in their mindfulness research.

In regards to the improvement of academic performance, Bellinger et al. (2015) conducted a study of 112 undergraduate students. They found mindfulness indirectly benefited math performance by reducing the experience of state anxiety. Further, Lin and Mai (2018) conducted a study investigating the effectiveness of mindfulness on academic performance on first-year undergraduate students. Compared to the control group, the experimental group had better short-term academic performance but similar long-term academic performance.

Although mindfulness is an evidence-based intervention, there are some weaknesses in the research. A recent meta-analysis on mindfulness interventions found they only yield small to medium effect sizes in some cases. These small effect sizes are attributed to mindfulness interventions lacking group cohesion for those administered in group settings, inquiry of how they experience the intervention, and psychoeducation. Further, because these interventions have become so popular, practitioners use these

techniques without much guidance. For these reasons, some authors have suggested the null hypothesis that mindfulness will yield no significant change compared to relaxation training (Blanck et al., 2018). Hedman-Lagerlof et al. (2018) also completed a meta-analysis on the effectiveness of mindfulness-based interventions on common mental disorders and found small effect sizes. Specifically, they found that outcomes for mindfulness-based interventions on common mental disorders in the acute phase is weak (Hedman-Lagerlof et al 2018).

Relaxation Training

Research to support the efficacy of mindfulness would be stronger if it demonstrated that mindfulness was more effective than a well-established intervention. Mindfulness is closer in its interventions to relaxation training. Therefore, comparing the effect of mindfulness to relaxation training would be a good test. The current study aims to compare mindfulness interventions with relaxation training interventions to investigate whether or not mindfulness adds therapeutic elements to a traditional well-established treatment. Although mindfulness involves the cultivation of non-judgmental, moment-to-moment awareness, relaxation training is centered on an intentional focus to relax (Smith & Norman, 2017). Relaxation training aims to elicit a relaxation response that is characterized by the hypothalamic mediated reaction. This reaction results in decreased sympathetic nervous system activity, reduced heart rate, lower metabolism, and decreased respiratory rate (Benson, 1983; Stahl et al., 2015). Since the introduction of relaxation training by Jacobsen (1938) almost 80 years ago, the utilization of this clinical approach has dramatically expanded. Relaxation training encompasses a wide variety of techniques, including progressive muscle relaxation, biofeedback, autogenic training, and

yoga (Hillenber & Collins, 1982). Progressive muscle relaxation is a technique that involves people systematically tensing and relaxing various muscle groups. This technique aims to achieve a state of deep relaxation in the person by learning to discriminate between the sensations of tension and relaxation (Jacobsen, 1939). In progressive muscle relaxation, sympathetic and parasympathetic nerves work reciprocally. Therefore, if one system is activated, it leads to the deactivation of the other. The sympathetic nervous system activates the organs for emergency and stress situations, while the parasympathetic promotes rest and repair. When doing progressive muscle relaxation exercise, the tension and relaxation of the muscles fire nerve fibers in both systems, which leads to complete relaxation (Conrad & Roth, 2007). The physiological mechanisms behind relaxation training have been heavily researched and well established.

A variety of studies have demonstrated the effectiveness of relaxation training on various psychopathologies including depression (Kahn and Kehle, 1990; Klainin-Yobus et al., 2015), anxiety (Dehghan-Nayeri and Adib-Hajbaghery, 2011; Klainin-Yobus et al., 2015; Manzoni et al., 2008; Sanchez-Mecha et al., 2009), and aggression (Deffenbacher, 2016; Gustainiene et al., 2015). Specifically, relaxation training has been heavily researched and found to be effective in reducing anxiety and stress and has been shown to reduce levels of anxiety after just once session for adolescents and adults (Rausch et al., 2006). Brief interventions using progressive muscle relaxation training have shown significant results in stress and anxiety reduction for a combined sample of adults and adolescents after only four weeks of treatment or less (Gustainiene et al., 2015; Joy et al., Jose and Nayak, 2014; Neeru et al., 2015). A meta-analysis found that using one method

of relaxation is preferable over using multiple methods, with progressive muscle relaxation showing the greatest effects sizes among other techniques (i.e., autogenic training, applied relaxation, and meditation). However, the studies were mainly based on studies examining adults not adolescents (Manzoni et al., 2008). Therefore, there is a need to explore whether mindfulness is equal to or superior to relaxation training to determine its efficacy. So far no such study has appeared.

A systematic review conducted by Klainin-Yobus et al. (2015) highlighted the effectiveness of relaxation training treatments and demonstrates that these techniques are significant in reducing depression. Although this review focused on an adult population, research on the efficacy of adolescents and relaxation has also been conducted. A study conducted on adolescent athletes found that progressive muscle relaxation significantly decreased depression scores (Hashim and Yusof, 2011).

Research supports the use of relaxation training techniques for treating anxiety related symptoms in both adults (Klainin-Yobus et al., 2015; Manzoni et al., 2008) and adolescents (Dehghan-Nayeri & Adib-Hajbaghery, 2011). Rasid and Parish (1998) conducted a study on the outcomes of relaxation techniques on 88 adolescents and found progressive muscle relaxation to be an effective treatment in lowering state anxiety in high school students.

Nickel et al. (2005) implemented progressive muscle relaxation on a group of 252 adolescents and found significant levels of reduction in aggression. Relaxation training techniques have also been found to be effective in decreasing aggressive symptomology in children with disruptive behavior disorders (Almutairi, 2011). The effectiveness of

relaxation training techniques with an adolescent population is an area that requires further research.

When introduced to a problem or stressor, individuals will have a variety of responses and coping abilities to overcome their perceived stress. Progressive muscle relaxation training has been used to help alleviate stress responses and serve as a useful coping strategy (Balk et al. 2009). Jain et al. (2007) compared mindfulness and relaxation training methodologies in an adult sample and found mindfulness and relaxation training were both effective in decreasing stress, but mindfulness was more effective in decreasing rumination. However, the literature regarding the use of relaxation training methods for adolescents is very limited. Gustainiene et al. (2015) implemented progressive muscle relaxation to 143 undergraduate students and found a significant reduction in stress.

There is little research to support the use of relaxation training techniques on self-concept. Kappes (1983) found significant improvement in individuals who received a relaxation training intervention as they exhibited an improved self-concept at the end of treatment. The study also found reductions in anxiety. Therefore, it is possible that with reductions in anxiety, individuals might have a greater ability to formulate self-concept. However, this research does not include adolescents and does not represent a current sample. Therefore, further research in this area is required.

There is little research on the effects of relaxation training on academic performance. However, Aritzeta et al. (2017) found that undergraduate students who participated in relaxation training had lower levels of anxiety and increased academic performance.

The Current Study

Conducting research on mindfulness is worthwhile due to the potential developments it can contribute to the field of psychology. Within the past ten years, many countries have utilized mindfulness training programs within their schools (Waters, Barsky, Ridd, & Allen, 2015; Wisner and Starzec, 2016). In a review of school-based meditation interventions, the effectiveness of the interventions yielded mixed results as far as promoting wellbeing but were generally significant in reducing negative affect. Further, mindfulness can be utilized as a preventative strategy to decrease the possibility of adolescents developing psychological disorders. One study examining a school-based mindfulness intervention for adolescents found that mindfulness training increased the students' awareness of socially relevant emotional stimuli and could decrease vulnerability of depression (Sanger et al., 2018). Overall, teaching adolescents mindfulness skills can result in better functioning, which could prevent future emotional instability.

The current study examined the efficacy of mindfulness and relaxation training methods on an adolescent sample. Both mindfulness and relaxation training are commonly used techniques that are effective in the treatment of various psychopathologies. However, the literature lacks an understanding whether or not these interventions are effective when working with adolescents in a school setting. Although relaxation training has an extensive history as a practical treatment approach, within the past decade the literature empirically supports the use of mindfulness interventions in producing positive outcomes in individuals suffering from various psychopathologies, serving as a positive coping mechanism for dealing with stress, and developing a stronger

positive self-concept. Further, mindfulness interventions aim to target emotional responses cognitions, and bodily sensations while the goal of relaxation training is to target only physiological responses. Therefore, it is hypothesized that mindfulness will be a more efficacious intervention than relaxation training in decreasing negative aggression, anxiety, disruptive behavior, depression, perceived stress, and improving self-concept and academic performance.

Further research examining the underlying mechanisms for change in each technique is also essential. Because relaxation training targets physiological changes in the body, its underlying mechanisms are biological. Clients learn a new behavioral response to stressors that mediates the negative emotions they experienced in association with the stimuli before the relaxation training. Due to the extensive research on the implementation of relaxation training, clinicians have a comprehensive understanding of how the nervous system initiates relaxation. While relaxation training has a physiological basis, mindfulness utilizes cognitive mechanisms in order to incite change. The most widely accepted underlying mechanisms of mindfulness are acceptance and attention (Holas & Jankowski, 2013; Kanget al., 2012; Shapiro et al., 2006). The effectiveness of mindfulness and relaxation training on psychopathology, as well as the underlying mechanisms for each intervention will be measured.

In addition to investigating the efficacy of mindfulness intervention compared to well-established treatment and investigating the underlying mechanisms of these interventions, this study aims to assess the effectiveness and utilization of these interventions in a school setting. Previous studies have investigated the effectiveness of mindfulness practices for adolescents in school settings. They have found significant

outcomes in increased well-being (Sanger et al., 2018), decreasing stress, and decreasing depressive symptoms (Kyuken et al., 2018). However, these studies failed to randomize their samples or compare their results to another well-established intervention (Kyuken et al., 2018; Sanger et al., 2018). Fung et al. (2018) investigated the effects of a mindfulness intervention on adolescents in a randomized controlled trial in a school setting. They found significant decreases in internalizing problems and stress. Conversely, other randomized-controlled trials have been conducted on the effectiveness of mindfulness for adolescents in a school setting and yielded no significant results (Johnson et al., 2016; Johnson et al., 2017). As the results of the efficacy of mindfulness interventions in school settings are mixed, there is a need for further investigation in this area. Further, to the knowledge of this investigator, no previous studies have examined the efficacy of mindfulness compared to another well-established treatment in a school setting, while also examining the underlying mechanisms of these treatments.

Hypotheses

1. It was hypothesized that participants receiving mindfulness would produce significantly better outcomes from pre to post-treatment in the reduction of perceived stress, anxiety, depression, anger, and disruptive behavior, as well as the increase of self-concept and academic improvement than the relaxation training group and than participants in an inactive control group in which the participants were placed on the waiting list and received no treatment. Furthermore, it was hypothesized the relaxation training would produce significantly better outcomes from pre to post-treatment in the reduction of perceived stress, anxiety, depression, anger, disruptive behavior as well as the

increase of self-concept and academic improvement than the inactive control group in which the participants were placed on the waiting list and received no treatment.

2. It was hypothesized participants in the mindfulness group would have greater attention and awareness from pre to post-treatment.. In contrast, participants in the relaxation training group would have higher body awareness and autonomic reactivity from pre to post-treatment.

Chapter 3: Research Method

Participants

Participants consisted of student volunteers from a girl's swim team and general education classes as per permission from school administration. The community from where the high school resided had a demographic makeup of 42.80% white, 6.18% black, 2.32% Asian, 0.21% Native American, and 0.08% Pacific Islander. The median income for a household the town in which the school resided is \$56, 289. Nine percent of the population is below the poverty line (U.S. Census Bureau, 2017). Student volunteers were initially assessed for eligibility (N = 90), and all participants were deemed eligible as they were all general education students between ages 14 and 18. Of the 90 volunteers assessed for eligibility, 41 agreed to participate and were randomly assigned to one of three groups. All participants were randomly assigned to either the mindfulness group (N = 14), the relaxation training group (N = 14), or the no contact control group (N = 13). The participants who completed all four weeks of the mindfulness intervention (N = 11) or relaxation training (N=8) intervention received the allocated intervention, and those in the inactive control group (N=8) remained on the waiting list. Participants who dropped out of the study were participants who either dropped out of the mindfulness group (N=3) or relaxation training group (N=6), or waiting list (N=5). More participants dropped out of the study at the two-month follow-up decreasing the sample size in the control (N = 2), relaxation training (N = 3), and mindfulness (N=3) groups. All participants were included in the analyses. However, the data collected in the two-month follow up was not analyzed as the sample size was too small. As academic improvement was assessed at the two-month follow up, this aspect of the study was dropped due to the small sample size.

The Consort Flow Chart detailing the participant enrollment can be found below in Figure 1.

This study was approved by the St. John's University Institutional Review Board. To ensure confidentiality, participant names were removed from all completed forms prior to data entry. Participants were identified only by a number code. Parents, school personnel, and all others involved in the project were informed that no information would be released about individual participants. Informed consent was obtained from parents for all adolescent participants (See Appendix B) and the participants signed assent forms (See Appendix C).

Procedure

The participants were recruited from a public high school. They were asked to volunteer from the girl's swim team as well as a series of general education classes. In the current study, the sample was randomly assigned to the three conditions: mindfulness intervention, relaxation training, or inactive control group. The treatments were administered in a gymnasium by this investigator. This investigator is a doctoral student in school psychology and has had formal training in mindfulness and relaxation training interventions both in graduate classes and in field placements. Participants in the mindfulness and relaxation training groups were administered the Beck Youth Inventory-2nd Edition (BYI-2), Perceived Stress Scale-10 (PSI), the Mindful Attention Awareness Scale (MAAS), and the Body Perception Questionnaire Short Form at pre-, post-treatment, and at two-month follow up. They were also asked to complete these forms again at a two-month follow-up. Also, at Post-treatment, the participants in the relaxation training and mindfulness groups were asked to complete the Working Alliance Inventory-

Short Form (WAI-SR) to assess how they related to their respective treatments.

Participants in the inactive control group were asked to complete the BYI-2 and PSI at pre-and post-treatment, and at the two-month follow up. At the two-month follow-up participants in all groups were asked to rate on a scale of “yes” or “no” if their academic performance had improved since the beginning of the study.

Treatments

The current study tested the efficacy of a breathing mindfulness intervention adapted from Acceptance and Commitment Therapy (ACT) as it is a well-researched evidence-based therapeutic technique. Both ACT and mindfulness focus on attention to the present moment and attending to the here and now. During mindfulness breathing exercises, the individual may find their attention drifting, but should return the focus to their breath at that moment. The nonjudgmental aspect of mindfulness is also encompassed in the acceptance portion of ACT. When practicing mindfulness, many thoughts and emotions arise, but are met with openness and acceptance (Hayes, Bond, Masuda, & Lillis, 2006). The participants in the Mindfulness group will undergo a brief mindfulness intervention. The intervention was adapted from *Mindfulness for Two: An Acceptance and Commitment Therapy Approach to Mindfulness Psychotherapy* by Wilson (2008). Specifically, the intervention incorporates the mindfulness and acceptance components of ACT.

Participants were given psychoeducation on mindfulness, in which they were taught to be aware of their thoughts in the moments and remain nonjudgmental in their way of thinking. They were guided through a mindfulness breathing exercise. The intervention was approximately 20 minutes long, once per week for four weeks. The

participants were encouraged to practice the exercise each day and were given an audio sample to guide them. They were also provided with a physical paper log to track their practice each day because daily practice is shown to be more effective (Parsons et al., 2017).

The participants in the Relaxation Training group were provided with psychoeducation on progressive muscle relaxation. The intervention was adapted from *Progressive Relaxation* by Jacobson (1929). They were then be guided through a progressive muscle relaxation exercise, which is shown to be one of the most effective techniques of relaxation training. They were given an audio sample to practice each day and a log to track each day they completed the exercise to ensure the most effective intervention possible (Hillenberg, Collins, 1982). This intervention was conducted for approximately 20 minutes per week for four weeks.

The participants in the no contact control group did not receive any treatment. They completed the BYI-2 and Perceived Stress Scale measures at week one, week four, and at follow-up, but did not participate in any intervention. Once the intervention was completed they were provided with links to the audio clips of the interventions.

Assessment Instruments

The Beck Youth Inventories, Second Edition (BYI-2) (Beck et al., 2005) was used to evaluate a broad range of psychological problems and symptomology and has subscales, including disruptive behavior, anger, depression, anxiety, and self-concept. The instrument contains 100 items and can be completed in approximately 25 minutes. The BYI-2 has substantial internal consistency for all scales, ranging from .86-.96. The

instrument also has acceptable test re-test reliability for samples of adolescents ranging from .93-.93 (Beck et al., 2005).

The Perceived Stress Scale – 10 (PSI) (Cohen, 1994) (See Appendix D) is a tool for measuring psychological stress. It is a self-report measure in which the individuals evaluate the degree in which their lives have been stressful or uncontrollable. The validity of the Perceived Stress Scale -10 was measured across twelve studies and yielded a Cronbach's alpha higher than .70 for each study. In addition, the test-retest reliability of the Perceived Stress Scale-10 was tested among four studies all of which had greater than .70 reliability (Lee, 2012).

At follow-up, the participants were asked if their academic performance had improved since the beginning of the study. They were asked to circle either “yes” or “no.” However, this was dropped from the analyses due to the small sample size.

The Mindful Attention and Awareness Scale (MAAS) (Brown & Ryan, 2003 See Appendix E) is a 15-item scale designed to assess a core characteristic of mindfulness, namely, a receptive state of mind in which attention, informed by a sensitive awareness of what is occurring in the present, simply observes what is taking place. Reliability coefficients of the MAAS are .89 or higher. The validity of the MAAS yielded a Cronbach's alpha of .87 (Montes et al., 2014; Osman et al., 2016).

The Body Perceptions Questionnaire Short Form (Porges, 2015) is a 46-item questionnaire designed to assess one's body awareness and automatic nervous system reactivity which is broken up into two subscales, sub-diaphragmatic reactivity and supra-diaphragmatic reactivity. This scale was completed by the students in the mindfulness and relaxation training intervention groups. It will assess how the students experience the

physiological mechanisms of change in the relaxation training group. Cabrera et al. (2017) analyzed the psychometric properties of the questionnaire, and findings demonstrated good reliability and validity. Cronbach's alpha ranged from .68 to .97. This assessment also yielded a high test re-test reliability of .99.

The Working Alliance Inventory- Short Form (WAI-SR, Horvath, 1992) (See Appendix G) is a 12-item questionnaire that assesses agreement on the tasks of therapy, agreement on the goals of therapy, and development of an affective bond. For outpatient and inpatient samples, Cronbach's alpha was excellent for the WAI-SR total score ($\alpha > 0.90$) (Munder et al., 2010).

To control for examiner bias, a second-year graduate student was asked to watch videos of the intervention being implemented for both the mindfulness and relaxation training group on all four weeks and complete Likert scale questions. The Likert scale questions consisted asked how enthusiastic the investigator was completing the intervention, how confident the investigator was completing the intervention, ratings of the investigator's attitude, and the level of interest of the investigator (See Appendix H).

As the literature supports the practice of both mindfulness and relaxation training, the amount of time each student practices with my tracked accordingly. Participants in the mindfulness and relaxation training groups will complete a worksheet with a series of Likert scales, asking them how many times they practiced each week. (See Appendix I).

Chapter 4: Results

Participants

Twenty-seven high school students participated in the present study. There were 4 freshmen (14.8%), 4 sophomores (14.8%), 8 juniors (29.6%) and 11 seniors (40.7%). The samples comprised of mostly females (n=19; 70.4%), with only 8 males (29.6%). Each participant was randomly assigned to one of three conditions: mindfulness (n = 11); relaxation (n = 8), and control (n = 8). Table 1 shows a breakdown of the three conditions in gender and grade. Figure 1 shows the breakdown of participant enrollment.

Table 1

Breakdown of Participants by Gender and Grade

Condition	Relaxation Inactive		
	Mindfulness	Training	Control
Male	4	2	2
Female	7	6	6
Freshmen	1	2	1
Sophomore	---	1	3
Junior	4	3	1
Senior	6	2	3

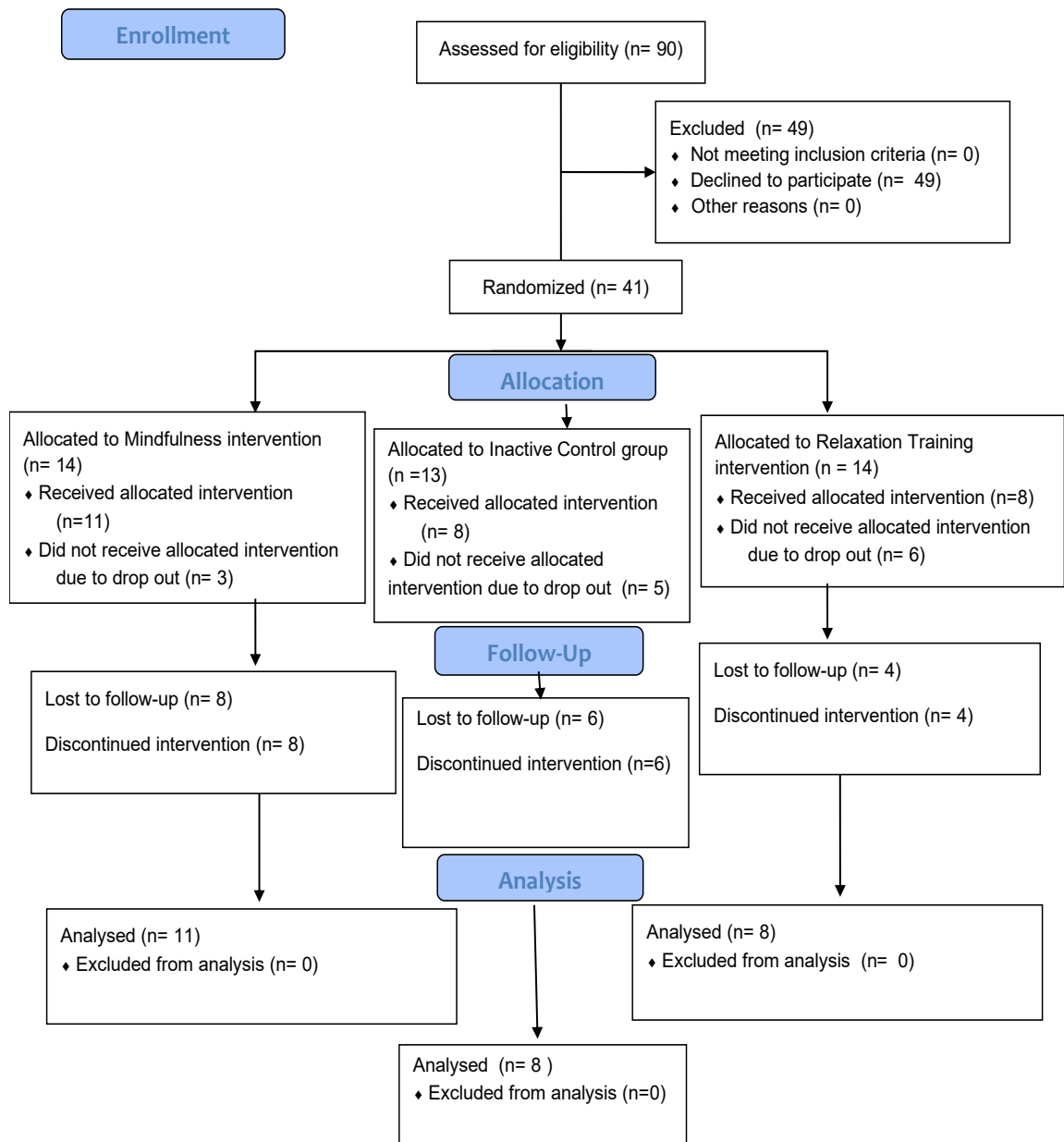


Figure 1. Breakdown of Participant Enrollment.

Preliminary Analyses:

One-way ANOVAs were conducted for each of the pre-test variables to determine if there were any significant differences in score at pre-intervention. Of all the ANOVAS conducted, two were statistically significant at pre-test: BAI score, $F(2, 24) = 4.94$, $p =$

.02, and BANI score, $F(2, 24) = 3.86, p = .04$. All other ANOVAs were nonsignificant, indicating that no significant differences between groups existed at pre-test. Due to the small sample size and the difficulty retaining subjects in the study, analyses were conducted to see if there were any significant differences in scores at pre-intervention. T-tests were conducted to test for differences in each dependent variable between participants who dropped out and those who stayed. There were no significant differences in pre-test score between those who dropped out and those who stayed for the entire study for any dependent variable. Further, Cronbach's Alpha coefficients were calculated to assess the internal consistency of the measures given at pre- and post-treatment. These results are found below in Table 2, and indicated all measures had good internal consistency at pre- and post-treatment.

Table 2

Cronbach's Alpha for All Measures Given at Pre- and Post- Treatment

Time Point	Scale	Cronbach's Alpha	N of Items
Pre-	Depression	.90	20.00
Post-	Depression	.92	19.00
Pre-	Anxiety	.94	20.00
Post-	Anxiety	.92	20.00
Pre-	Anger	.92	20.00
Post-	Anger	.91	20.00
Pre-	Disruptive B.	.84	20.00
Post-	Disruptive B.	.87	20.00
Pre-	Self-Concept	.95	20.00
Post-	Self-Concept	.93	20.00
Pre-	Stress	.86	10
Post-	Stress	.71	10
Pre-	Mindfulness	.91	15
Post-	Mindfulness	.91	15
Pre-	Body Aware.	.94	26
Post-	Body Aware.	.96	26
Pre-	Reactivity	.88	20
Post-	Reactivity	.95	20

Note. .70 or higher indicates good internal consistency.

Examiner bias was also assessed to examine whether the investigator was equally, confident, interested, enthusiastic, and maintained a positive attitude. The investigator was scored as “neutral” for both the mindfulness and relaxation training interventions for all four weeks indicating no significant difference in the administration of each intervention.

An independent samples *t*-test was used to assess the results of the WAI to determine whether the participants in the mindfulness and relaxation groups related to their respective interventions. The results of the analyses indicated there was no

significant difference between how each group of participants related to their respective interventions ($t(15) = -.69, p = .50$). The WAI –Task subscale was also assessed to see if there was a difference between how each treatment group related to the specific tasks of their respective interventions. Results yielded there were no difference on this subscale ($t(12) = .94, p = .37$).

Depression

The current study hypothesized that those participants in the mindfulness condition would have the greatest reduction in depression scores as compared to those in the relaxation and control group. Table 3 shows the mean pre and post BYI-Depression scores for each condition.

Table 3

Means and Standard Deviations Across All Conditions for Beck Youth Inventories, 2nd Edition-Depression Scores

	Condition	Mean	Standard Deviation	N
BYI-Depression at Pre-Test	Mindfulness	53.60	9.73	10
	Relaxation Training	47.00	4.76	7
	Inactive Control	51.13	8.94	8
	Total	50.96	8.48	25
BYI-Depression at Post-Test	Mindfulness	49.90	10.97	10
	Relaxation Training	46.29	5.38	7
	Inactive Control	46.75	4.80	8
	Total	47.88	7.87	25

*Note. Mean = 50, Standard Deviation=10

A split-plot ANOVA was conducted to compare the mean BYI -Depression subscale scores for each condition at each time. In this 3 x 2 design, there was one between group factor that represented the three treatment groups and a repeated measure factor that represented pretreatment and posttreatment. The main effect for treatments

across time was non-significant for depression ($F(1, 22) = 3.04, p = .10$). The main effect for time across treatments was also non-significant for depression ($F(2, 22) = 1.10, p = .35$). The interaction between time and treatment was non-significant on the participants' levels of depression ($F(2, 22) = .41, p = .67$). Figure 2 shows the change in depression scores for each time point.

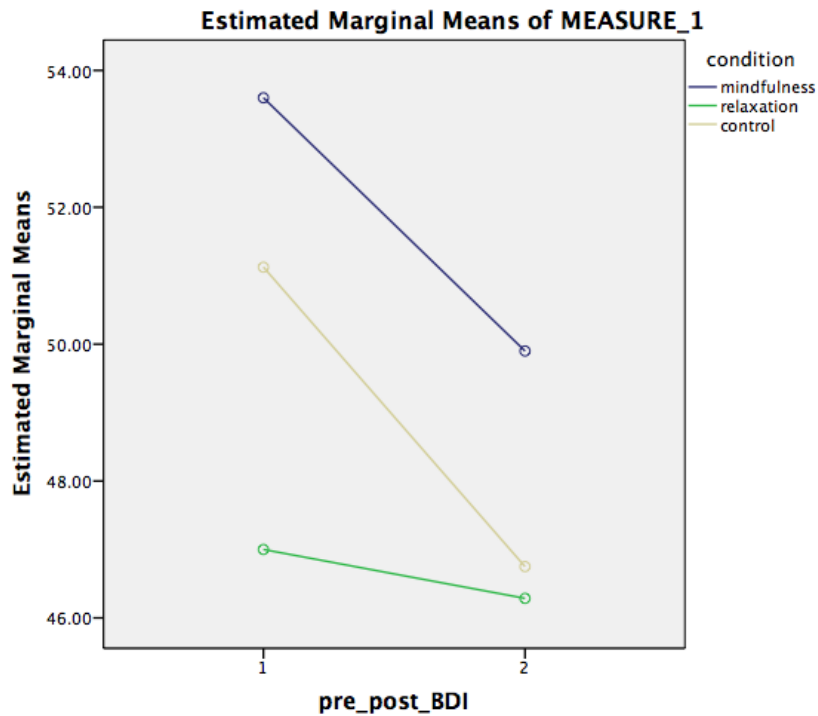


Figure 2: Estimated Marginal Means of Beck Youth Inventories, 2nd Edition-Depression Scores from Pre- to Post- Treatment.

Anxiety

The present study hypothesized that those participants in the mindfulness condition would have the greatest reduction in BYI - Anxiety scores as compared to those in the relaxation and control group. Table 4 shows the mean pre- and post- BYI-Anxiety scores for each condition.

Table 4

Means and Standard Deviations Across All Conditions for Beck Youth Inventories, 2nd Edition-Anxiety Scores

	Condition	Mean	Standard Deviation	N
BYI- Anxiety at Pre-Test	Mindfulness	58.45	13.69	11
	Relaxation	43.14	5.01	7
	Training	47.38	8.70	8
	Inactive Control	50.92	12.17	26
	Total			
BYI-Anxiety at Post-Test		50.18	12.66	11
	Mindfulness	42.86	5.40	7
	Relaxation	46.88	7.77	8
	Training	47.19	9.86	26
	Inactive Control			
	Total			

*Note. Mean = 50, Standard Deviation=10

A split-plot ANOVA was conducted to compare the mean BYI-Anxiety scores for each condition at each point in time. In this 3 x 2 design, there was one between-group factor that represented the three treatment groups and a repeated measure factor that represented pretreatment and posttreatment. The main effect for treatments across time was non-significant for anxiety ($F(1, 23) = 2.31, p = .14$). The main effect for time across treatments was significant for anxiety ($F(2, 23) = 3.76, p = .04$). The interaction between time and treatment was non-significant ($F(2, 23) = 1.99, p = .16$) on the participants' levels of anxiety. Figure 3 shows the change in anxiety from pre- to post-treatment for each group.

Since the main effect for time across treatments was significant, additional analyses were conducted to control for the pre-test differences of the BYI-anxiety scores. An ANCOVA of the BYI-Anxiety post-test scores with the pre-test scores as the

covariate. Results of the analysis demonstrates there was no main effect of time across treatment after controlling for pre-test differences ($F(2, 22) = .15, p = .86$).

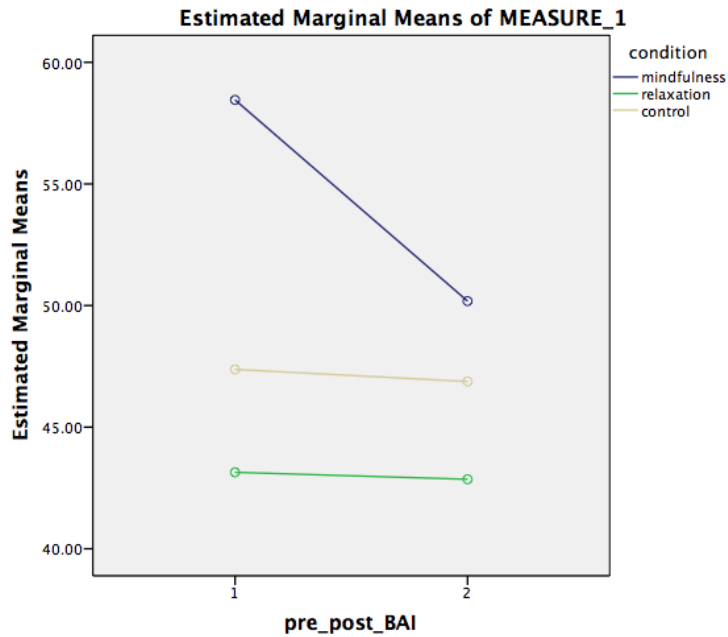


Figure 3: Estimated Marginal Means of the Beck Youth Inventories, 2nd Edition- Anxiety Scores from Pre- to Post-Treatment.

Anger

The present study hypothesized that those participants in the mindfulness condition would have the greatest reduction in anger scores as compared to those in the relaxation and control group. Table 4 shows the mean pre and post BYI – Anger scores for each condition.

Table 5

Means and Standard Deviations Across All Conditions for Beck Youth Inventories, 2nd Edition-Anger Scores

	Condition	Mean	Standard Deviation	N
BYI- Anger at Pre-Test	Mindfulness	59.18	12.30	11
	Relaxation Training	47.86	8.97	7
	Inactive Control	49.62	8.18	8
	Total	53.19	11.24	26
BYI-Anger at Post-Test	Mindfulness	51.27	10.84	11
	Relaxation Training	46.43	8.14	7
	Inactive Control	44.75	3.41	8
	Total	47.96	8.66	26

*Note. Mean = 50, Standard Deviation=10

A split-plot ANOVA was conducted to compare the mean BYI-Anger scores for each condition at each point in time. In this 3 x 2 design, there was one between-group factor that represented the three treatment groups and a repeated measure factor that represented pretreatment and posttreatment. The main effect for treatments across time was significant for anger ($F(1, 23) = 5.35, p = .03$). The main effect for time across treatments was non-significant for non-significant ($F(2, 23) = 1.10, p = .35$). The interaction between time and treatment was non-significant ($F(2, 23) = .86, p = .44$) on the participants' level of anger. Figure 4 demonstrates the change in anger from pre- to post-treatment for each group.

Since the main effect for treatments across time was significant, additional analyses were conducted to control for the pre-test differences of the BYI-anger scores. An ANCOVA of the BYI-Anger post-test scores with the pre-test scores as the covariate.

Results of the analysis demonstrate there was no main effect of treatment across time after controlling for pre-test differences ($F(2, 22) = .36, p = .70$).

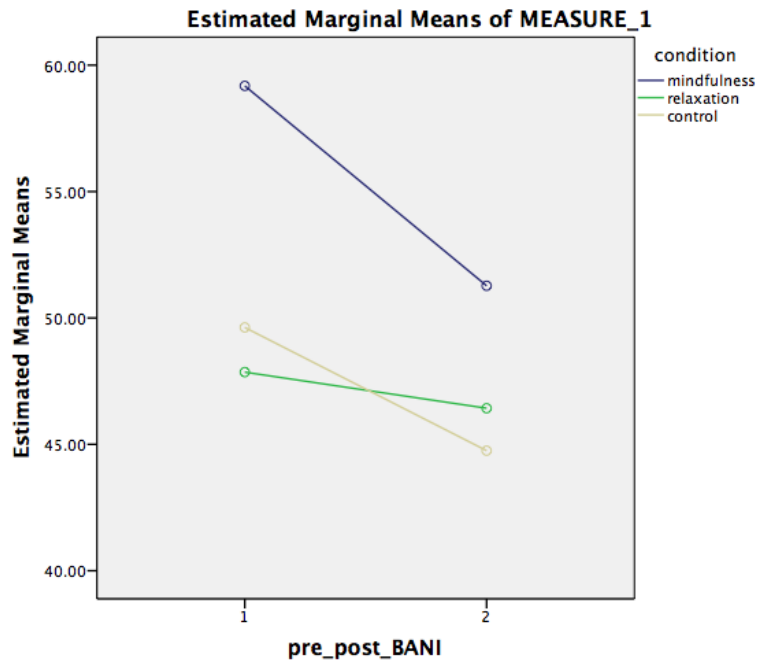


Figure 4: Estimated Marginal Means of Beck Youth Inventories, 2nd Edition-Anger Scores from Pre- to Post-Treatment.

Disruptive Behavior

The present study hypothesized that those participants in the mindfulness condition would have the greatest reduction in disruptive behavior scores as compared to those in the relaxation and control group. Table 6 shows the mean pre and post BYI-Disruptive Behavior scores for each condition.

Table 6

Means and Standard Deviations Across All Conditions for Beck Youth Inventories, 2nd Edition-Disruptive Behavior Scores

	Condition	Mean	Standard Deviation	N
BYI- Disruptive Behavior at Pre-Test	Mindfulness	54.73	8.32	11
	Relaxation Training	47.14	8.07	7
	Inactive Control	49.25	7.48	8
	Total	51.00	8.38	26
BYI-Disruptive Behavior at Post-Test	Mindfulness	49.45	10.93	11
	Relaxation Training	44.71	6.75	7
	Inactive Control	47.88	6.92	8
	Total	47.69	8.72	26

*Note. Mean = 50, Standard Deviation=10

A split-plot ANOVA was conducted to compare the mean BYI-Disruptive Behavior scores for each condition at each point in time. In this 3 x 2 design, there was one between-group factor that represented the three treatment groups and a repeated measure factor that represented pretreatment and posttreatment. The main effect for treatments across time was non-significant for disruptive behavior ($F(1, 23) = 2.38, p = .14$). The main effect for time across treatments was also non-significant for disruptive behavior ($F(2, 23) = 1.80, p = .19$). The interaction between time and treatment was non-significant ($F(2, 23) = .40, p = .67$) on the participants' level of disruptive behavior. Figure 5 demonstrates the change in disruptive behavior from pre- to post-treatment for each group.

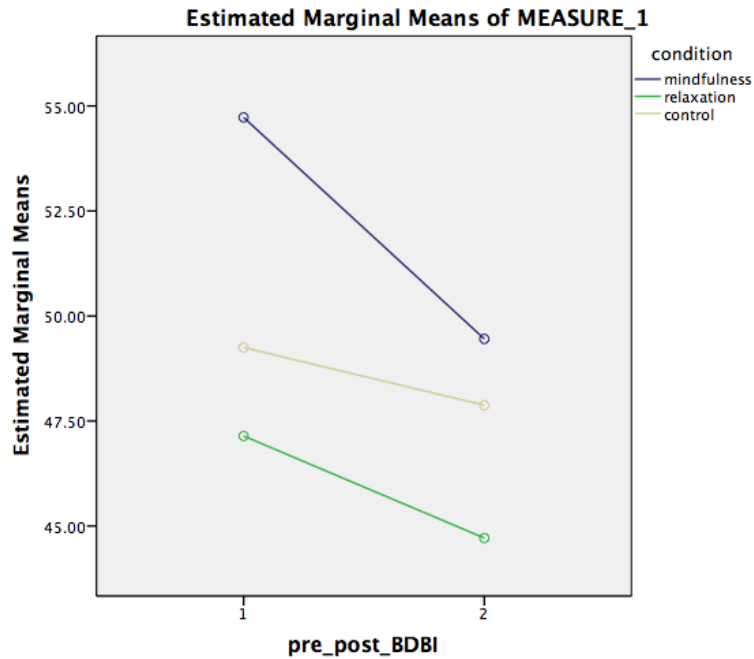


Figure 5: Estimated Marginal Means of Beck Youth Inventories, 2nd Edition-Disruptive Behavior Scores from Pre- to Post-Treatment.

Self-Concept

The current study hypothesized that those participants in the mindfulness condition would have the greatest increase in their self-concept scores as compared to those in the relaxation and control group. Table 7 shows the mean pre and BYI- Self Concept scores for each condition.

Table 7

Means and Standard Deviations Across All Conditions for Beck Youth Inventories, 2nd Edition-Self-Concept Scores

	Condition	Mean	Standard Deviation	N
BYI- Self-Concept at Pre-Test	Mindfulness	51.27	11.59	11
	Relaxation Training	51.71	13.96	7
	Inactive Control	41.17	20.34	6
	Total	48.88	14.83	24
BYI-Self-Concept at Post-Test	Mindfulness	51.27	13.19	11
	Relaxation Training	56.57	11.63	7
	Inactive Control	47.67	6.68	6
	Total	51.92	11.50	24

**Note.* Mean = 50, Standard Deviation=10

A split-plot ANOVA was conducted to compare the mean BYI-Self Concept scores for each condition at each point in time. In this 3 x 2 design, there was one between-group factor that represented the three treatment groups and a repeated measure factor that represented pretreatment and posttreatment. The main effect for treatments across time was non-significant for self-concept ($F(1, 21) = 1.67, p = .21$). The main effect for time across treatments was also non-significant for self-concept ($F(2, 21) = 1.27, p = .11$). The interaction between time and treatment was non-significant ($F(2, 21) = .51, p = .61$) on the participants' level of self-concept. Figure 6 demonstrates the change in self-concept from pre- to post-treatment.

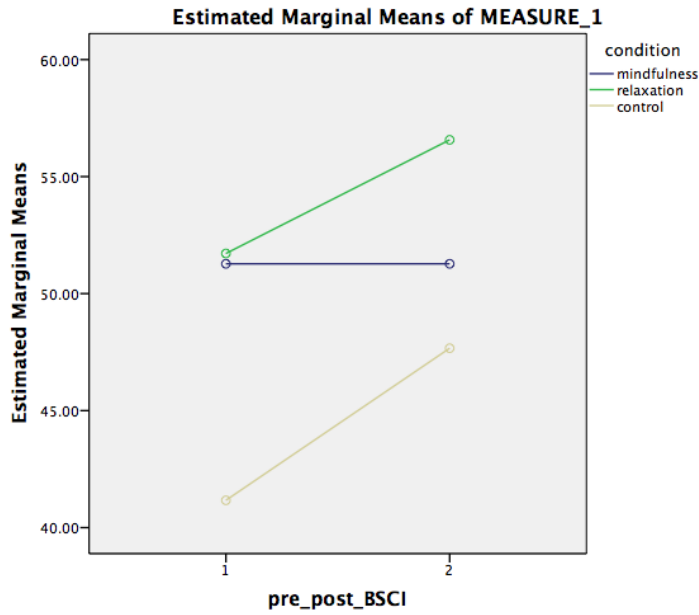


Figure 6: Estimated Marginal Means of Beck Youth Inventories, 2nd Edition-Self Concept from Pre- to Post-Treatment.

Stress

The current study hypothesized that those participants in the mindfulness condition would have the greatest reduction in their stress levels as compared to those in the relaxation and control group. Table 8 shows the mean pre and post PSI scores for each condition.

Table 8

Means and Standard Deviations Across All Conditions for Perceived Stress Scale-10 Scores

	Condition	Mean	Standard Deviation	N
PSI at Pre-Test	Mindfulness	21.91	8.12	11
	Relaxation Training	21.50	1.29	4
	Inactive Control	16.38	6.55	8
	Total	19.91	7.13	23
PSI at Post-Test	Mindfulness	20.55	7.87	11
	Relaxation Training	14.00	3.56	4
	Inactive Control	17.13	5.77	8
	Total	18.22	6.84	23

*Note. Mean = 14.2, Standard Deviation = 6.2

A split-plot ANOVA was conducted to compare the mean PSI scores for each condition at each point in time. In this 3 x 2 design, there was one between-group factor that represented the three treatment groups and a repeated measure factor that represented pretreatment and posttreatment. The main effect for treatments across time was non-significant for stress ($F(1, 20) = 1.56, p = .23$). The main effect for time across treatments was also non-significant for stress ($F(2, 20) = 2.15, p = .15$). The interaction between time and treatment was non-significant ($F(2, 20) = 1.08, p = .38$) on the participants' level of stress. Figure 6 demonstrates the change in stress from pre- to post-treatment.

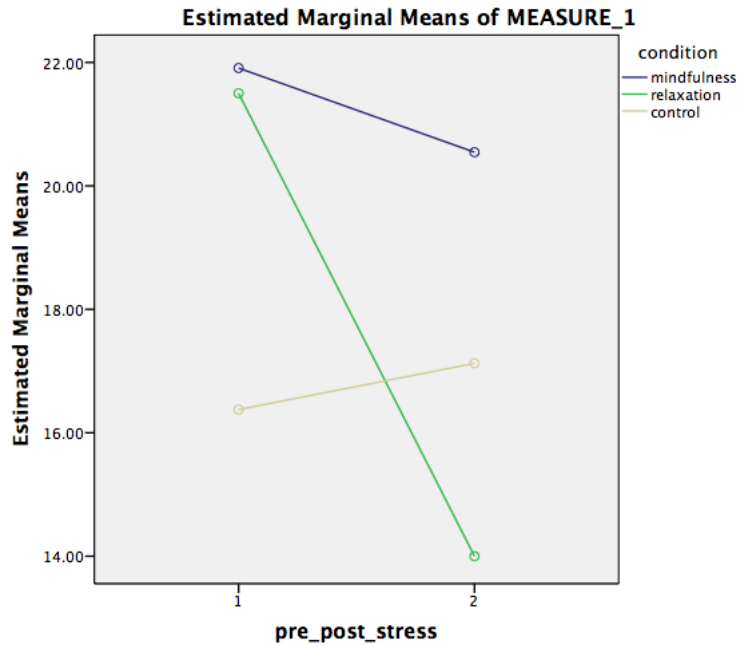


Figure 7: Estimated Marginal Means of Perceived Stress Scale-10 Scores from Pre- to Post-Treatment.

Mindful Attention and Awareness

The present study hypothesized that those participants in the mindfulness condition would have the greatest improvement in their attention and awareness as compared to those in the relaxation group. Table 9 shows the mean pre and post Mindfulness scores for each condition.

Table 9

Means and Standard Deviations Across Both Conditions for Mindful Attention and Awareness Scale Scores

	Condition	Mean	Standard Deviation	N
MAAS at Pre-Test	Mindfulness	3.90	1.20	11
	Relaxation	4.23	1.06	4
	Training	3.99	1.14	15
	Total	4.23	1.08	11
MAAS at Post-Test	Mindfulness	4.38	.95	4
	Relaxation	4.27	1.02	15
	Training			
	Total			

*Note. Mean = 3.83, Standard Deviation = .70

A split plot ANOVA was conducted to compare the mean Mindfulness scores for each condition at each point in time. In this 2 x 2 design, there was one between group factor that represented the three treatment groups and a repeated measure factor that represented pretreatment and posttreatment. The main effect for treatments across time was non-significant for mindful attention and awareness ($F(1, 13) = 1.40, p = .26$). The main effect for time across treatments was also non-significant for mindful attention and awareness ($F(1, 13) = .15, p = .70$). The interaction between time and treatment was non-significant ($F(1, 13) = .19, p = .67$) on the participants' level of mindful attention and awareness. Figure 8 demonstrates the change in mindfulness from pre- to post-treatment.

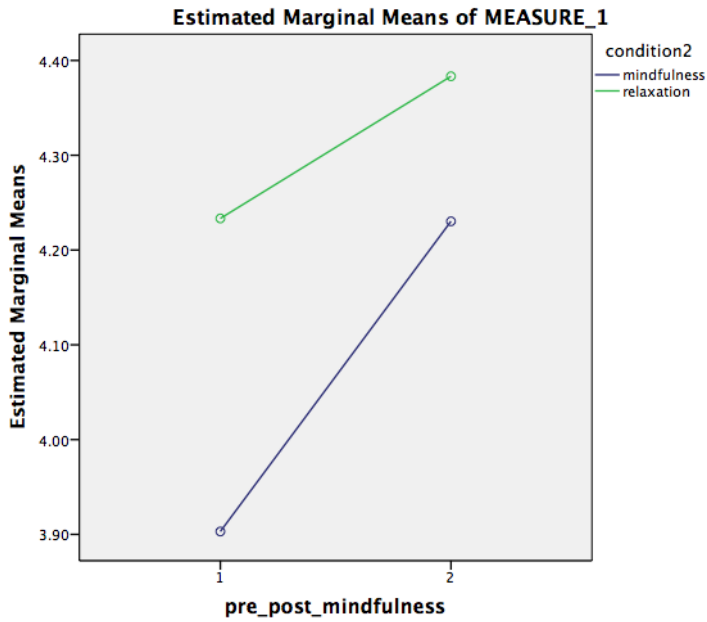


Figure 8: Estimated Marginal Means of Mindful Attention and Awareness Scale Scores from Pre- to Post-Treatment.

Body awareness

The present study hypothesized that those participants in the relaxation training condition would have the greatest improvement in their body awareness as compared to those in the mindfulness group. Table 10 shows the mean pre and post body awareness scores for each condition.

Table 10

*Means and Standard Deviations Across Both Conditions for Body Perception
Questionnaire-Body Awareness Scores*

	Condition	Mean	Standard Deviation	N
BPQ-Body Awareness at Pre- Test	Mindfulness	59.05	16.02	11
	Relaxation Training	47.18	8.98	6
	Total	54.86	14.82	17
BPQ-Body Awareness at Post- Test	Mindfulness	50.85	12.99	11
	Relaxation Training	46.67	8.95	6
	Total	49.37	11.61	17

*Note. Mean = 50, Standard Deviation = 10

A split-plot ANOVA was conducted to compare the mean body awareness scores for each condition at each point in time. In this 2 x 2 design, there was one between-group factor that represented the three treatment groups and a repeated measure factor that represented pretreatment and posttreatment. The main effect for treatments across time was non-significant for body awareness ($F(1, 15) = 1.99, p = .18$). The main effect for time across treatments was also non-significant for body awareness ($F(1, 15) = 1.90, p = .19$). The interaction between time and treatment was non-significant ($F(1, 15) = 1.54, p = .23$) for the participants' level of body awareness. Figure 9 demonstrates the change in body awareness from pre- to post-treatment.

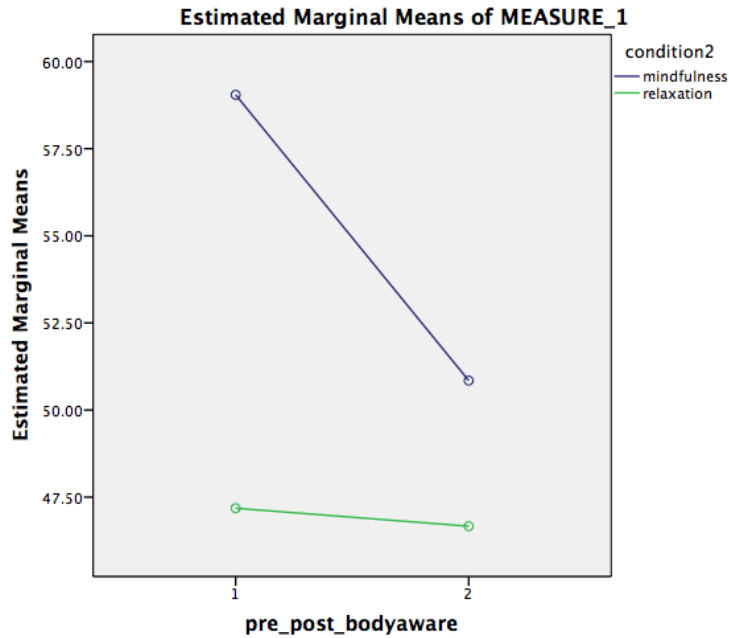


Figure 9: Estimated Marginal Means of Body Perception Questionnaire-Body Awareness Scores from Pre- to Post- Treatment.

Sub- diaphragmatic Reactivity

The present study hypothesized that those participants in the relaxation training condition would have the greatest improvement in their sub-diaphragmatic breathing as compared to those in the mindfulness group. Table 11 shows the mean pre and post sub-diaphragmatic scores for each condition.

Table 11

*Means and Standard Deviations Across Both Conditions for Body Perception
Questionnaire-Sub-diaphragmatic Reactivity Scores*

	Condition	Mean	Standard Deviation	N
BPQ-Sub- diaphragmatic Reactivity at Pre- Test	Mindfulness	48.47	9.70	11
	Relaxation Training	46.06	10.55	7
	Total	47.53	9.80	18
BPQ-Sub- diaphragmatic Reactivity at Post- Test	Mindfulness	43.55	9.87	11
	Relaxation Training	45.09	14.50	7
	Total	44.15	11.49	18

*Note. Mean = 50, Standard Deviation = 10

A split-plot ANOVA was conducted to compare the mean Mindfulness scores for each condition at each point in time. In this 2 x 2 design, there was one between-group factor that represented the three treatment groups and a repeated measure factor that represented pretreatment and posttreatment. The main effect for treatments across time was non-significant for sub-diaphragmatic reactivity ($F(1, 16) = 1.55, p = .23$). The main effect for time across treatments was also non-significant for sub-diaphragmatic reactivity ($F(1, 16) = .01, p = .93$). The interaction between time and treatment was non-significant ($F(1, 16) = .70, p = .42$) for the participants' levels of sub-diaphragmatic reactivity. Figure 10 demonstrates the change in sub-diaphragmatic reactivity from pre- to post-treatment.

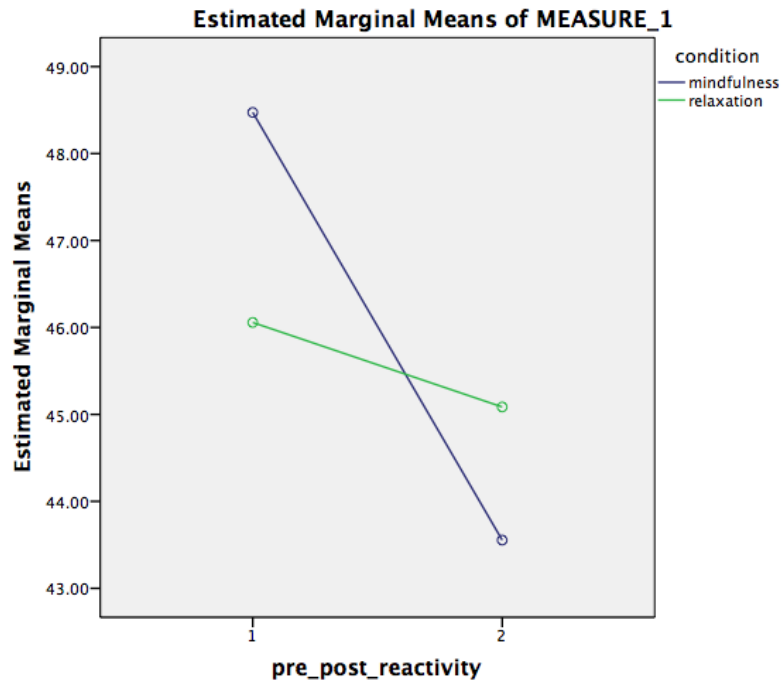


Figure 10: Estimated Marginal Means of Body Perception Questionnaire-Sub-diaphragmatic Reactivity Scores from Pre- to Post- Treatment.

Supra-Diaphragmatic Reactivity

The present study hypothesized that those participants in the relaxation training condition would have the greatest improvement in their reactivity as compared to those in the mindfulness group. Table 12 shows the mean pre and post reactivity scores for each condition.

Table 12

Means and Standard Deviations Across Both Conditions for Body Perception Questionnaire-Supra-diaphragmatic Reactivity Scores

	Condition	Mean	Standard Deviation	N
BPQ-Supra-diaphragmatic Reactivity at Pre Test	Mindfulness	47.14	17.05	11
	Relaxation Training	45.19	7.76	7
	Total	46.38	13.90	18
BPQ-Supra-diaphragmatic Reactivity at Post-Test	Mindfulness	47.81	10.65	11
	Relaxation Training	43.44	8.87	7
	Total	46.11	9.97	18

*Note. Mean = 50, Standard Deviation = 10

A split-plot ANOVA was conducted to compare the mean Mindfulness scores for each condition at each point in time. In this 2 x 2 design, there was one between-group factor that represented the three treatment groups and a repeated measure factor that represented pretreatment and posttreatment. The main effect for treatments across time was non-significant for supra-diaphragmatic reactivity ($F(1, 16) = .03, p = .88$). The main effect for time across treatments was also non-significant for supra-diaphragmatic reactivity ($F(1, 16) = .41, p = .53$). The interaction between time and treatment was non-significant ($F(1, 16) = .13, p = .73$) for the participants' level of supra-diaphragmatic reactivity. Figure 11 demonstrates the change in sub-diaphragmatic reactivity from pre- to post-treatment.

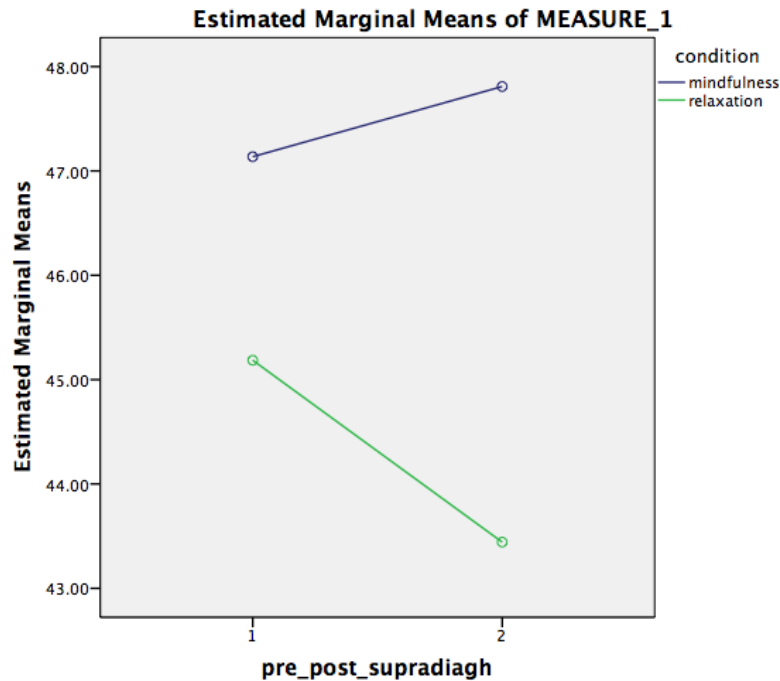


Figure 11: Estimated Marginal Means of Body Perception Questionnaire- Supra-diaphragmatic Reactivity Scores from Pre- to Post-Treatment.

Additional Analyses

Correlation matrices were utilized to examine the relationship between the various dependent variables. The results showed that Mindfulness was negatively correlated with anger ($r = -.46, p = .05$) at pre-test and negatively correlated with depression ($r = -.71, p = .00$), anxiety ($r = -.84, p = .00$), anger ($r = -.93, p = .00$), disruptive behavior ($r = -.79, p = .00$), and stress ($r = -.60, p = .02$) at post-test. The results also yielded that Body Awareness was positively correlated with depression ($r = .54, p = .02$) and anxiety ($r = .53, p = .02$) at pre-test. Correlations of pre- to post- change scores also yielded Body Awareness was positively correlated with depression ($r = .54, p = .02$), anxiety ($r = .53, p = .02$), anger ($r = .51, p = .03$), disruptive behavior ($r = .68, p = .00$), and stress ($r = .63, p = .00$). Results yielded Supradiaphragmatic reactivity was positively correlated

with anxiety ($r = .56, p = .01$) and stress ($r = .55, p = .02$) at pre-test and positively correlated with anxiety ($r = .60, p = .01$) and anger ($r = .56, p = .02$) at post-test.

Correlations of pre- to post- change scores also yielded Supradiaphragmatic Reactivity was positively correlated with depression ($r = .53, p = .02$), anxiety ($r = .75, p = .00$), and stress ($r = .59, p = .01$). Results yielded Subdiaphragmatic Reactivity was positively correlated with anger ($r = .50, p = .03$) and stress ($r = .51, p = .04$) at pre-test.

Correlations of pre- to post-test change scores also yielded subdiaphragmatic reactivity was positively correlated with depression ($r = .59, p = .01$), anxiety ($r = .65, p = .00$), disruptive behavior ($r = .46, p = .05$), and stress ($r = .59, p = .01$). Correlation matrices of outcome measures at pre-treatment, post-treatment, and correlations of pre- to post-change scores are found in Table 13, Table 14, and Table 15, respectively.

Table 13

Correlations of Outcome Measures at Pre- Treatment

Measure	1	2	3	4	5	6	7	8	9	10
1. Depression	-									
2. Anxiety	.54**	-								
3. Anger	.69**	.70**	-							
4. Disruptive Behavior	.65**	.32	.58**	-						
5. Self-Concept	-.36	.08	-.08	-	-					
				.28						
6. Stress	.29	.51**	.53**	.31	-	-				
					.07					
7. Mindfulness	-.42	-.32	-.46*	-	-	-.19	-			
				.21	.08					
8. Body Awareness	.54*	.53*	.30	.38	-	.15	.15	-		
					.44					
9. Supradiaphragmatic Reactivity	.41	.56*	.33	-	-	.55*	-	.28	-	
				.14	.10		.09			
10. Subdiaphragmatic Reactivity	.43	.41	.50*	.03	-	.51*	-	.33	.56*	-
					.18		.13			

Note. * $p < .05$, ** $p < .01$

Table 14

Correlations of Outcome Measures at Post- Treatment

Measure	1	2	3	4	5	6	7	8	9	10
1. Depression	-									
2. Anxiety	.75**	-								
3. Anger	.84**	.84**	-							
4. Disruptive Behavior	.76**	.60**	.72**	-						
5. Self-Concept	-.41*	-.11	-.30	-.32	-					
6. Stress	.42*	.36	.47*	.32	-.40	-				
7. Mindfulness	-	-.84**	-.93**	-.79**	.17	-	-			
8. Body Awareness	.71**					.60*				
9. Supra-Reactivity	.45	.60**	.56*	.44	-	.29	-.53*	.61	-	
10. Sub-Reactivity	.12	.32	.16	.09	-	.03	-.12	.51	.72**	-

Note. * $p < .05$, ** $p < .01$

Table 15

Correlations of Outcome Measures of Pre- to Post- Change Scores

Measure	1	2	3	4	5	6	7	8	9	10
1. Depression	-									
2. Anxiety	.60**	-								
3. Anger	.66**	.75**	-							
4. Disruptive Behavior	.62**	.65**	.69**	-						
5. Self-Concept	.15	.29	.11	.13	-					
6. Stress	.38	.51**	.50*	.31	-	-				
7. Mindfulness	-.10	.13	-.01	.05	.19	.63	-			
8. Body Awareness	.62**	.72**	.51*	.68**	.34	.63*	.33	-		
9. Supradiaphragmatic Reactivity	.53**	.75**	.39	.33	.32	.59**	.31	.64*	-	
10. Subdiaphragmatic Reactivity	.59**	.65**	.42	.46*	.36	.59**	.32	.81*	.74	-

Note. * $p < .05$, ** $p < .01$

Since the participant sample of this study was taken from a general population of students, the participants lacked elevated scores at pre-treatment, thus resulting in a lower chance of change at post-treatment. Therefore, Table 16 below, demonstrates the participants who had elevated scores at pre-treatment and their scores at post-treatment.

Table 16

Means and Standard Deviations of Outcome Measures with Elevated Scores at Pre-Treatment

Time Point	Scale	Treatment Group	N	Mean	Standard Deviation
Pre-	Depression	Mindfulness	1	61.00	---
Post-	Depression	Mindfulness	1	44.00	---
Pre-	Depression	Control	1	69.00	---
Post-	Depression	Control	1	42.00	---
Pre-	Anxiety	Mindfulness	4	73.00	3.92
Post-	Anxiety	Mindfulness	4	46.25	11.00
Pre-	Anger	Mindfulness	3	70.00	7.21
Post-	Anger	Mindfulness	3	47.00	8.19
Pre-	Anger	Relaxation	1	65.00	---
Post-	Anger	Relaxation	1	57.00	---
Pre-	Disruptive Beh.	Mindfulness	1	61.00	---
Post-	Disruptive Beh.	Mindfulness	1	41.00	---
Pre-	Disruptive Beh.	Control	1	64.00	---
Post-	Disruptive Beh.	Control	1	46.00	---
Pre-	Self-Concept	Mindfulness	2	38.00	2.83
Post-	Self-Concept	Mindfulness	2	54.00	9.90
Pre-	Self-Concept	Relaxation	2	38.50	2.12
Post-	Self-Concept	Relaxation	2	53.00	12.73
Pre-	Self-Concept	Control	1	39.00	---
Post-	Self-Concept	Control	1	48.00	---
Pre-	Stress	Mindfulness	3	28.67	1.53
Post-	Stress	Mindfulness	3	13.33	4.51
Pre-	Stress	Relaxation	3	22.00	1.00
Post-	Stress	Relaxation	3	13.33	4.04
Pre-	Stress	Control	2	22.00	.00
Post-	Stress	Control	2	13.00	4.24
Pre-	Mindfulness	Mindfulness	2	2.72	.64
Post-	Mindfulness	Mindfulness	2	3.60	.57
Pre-	Mindfulness	Relaxation	4	3.22	.19
Post-	Mindfulness	Relaxation	4	4.73	.57
Pre-	Subdiaphragmatic	Mindfulness	1	67.1	---
Post-	Subdiaphragmatic	Mindfulness	1	62.2	---

*Note. Mean = 50, Standard Deviation = 10, $p < .05$ for all measures except stress and mindfulness. Stress: Mean = 14.2, Standard Deviation = 6.2, $p < .05$; Mindfulness: Mean = 3.83, Standard Deviation = .70, $p < .05$

Homework completion

HW completion was calculated by asking participants to track how many times per week they completed their HW. In week 2, participants in the mindfulness group completed their HW on average .09 times (SD = .30), with only one participant indicating they completed it one time. Week 2 in the relaxation group had a mean HW completion of .38 (SD = 1.06), with one participant indicating they completed HW 3 times. In week 3 of mindfulness group, HW completion was on average .23 (SD = .90), with one participant indicating they completed HW 3 times. In week 3 of relaxation group, HW completion was 0. In week 4 of mindfulness group, HW completion was on average 1.55 (SD = 1.86), with 4 people practicing HW twice, one person three times and one person 6 times. HW completion in relaxation group week 4 was on average 1.00 (SD = 1.77), with one person practicing once, one person twice, and one person 5 times. A paired samples t-test was conducted to determine if there was a significant difference in HW completion between the two groups at any given week. Results, detailed below in Table 17, indicated that there was no significant difference in HW completion between the two conditions.

Table 17

Paired Samples T-Test for Homework Completion

	M	SD	t	Df	Sig (2- tailed)
Pair 1 HW2M- HW2-R	-.25	.71	-1.00	7	.35
Pair 2 HW3M- HW3R	.38	1.06	1.00	7	.35
Pair 3 HW4M- HW4R	.88	1.36	1.82	7	.11

**Note.* Mean = 50, Standard Deviation = 10, $p < .05$

Chapter 5: Discussion

The present study explored the effectiveness of two commonly utilized interventions, mindfulness and relaxation training, in an adolescent sample. This was accomplished by exploring how these interventions impact various facets including depression, anxiety, anger, self-concept, stress, and academic improvement, as well as exploring the underlying mechanisms in these interventions. By assessing the underlying mechanisms within mindfulness and relaxation training, we can gain a better understanding of how these interventions work to change psychopathologies.

Interpretation of Findings

This study sought to determine whether mindfulness or relaxation training would be effective in changing depression, anxiety, anger, self-concept, stress, and academic improvement in an adolescent sample. Before this study, we postulated that mindfulness would produce more significant outcomes for depression, anxiety, anger, self-concept, stress, and academic improvement than relaxation training, and relaxation training would produce more significant outcomes than the control group. However, no group produced a significant change in any of the above dependent measures. Further, there was no significant difference in outcomes between the mindfulness, relaxation training, and control groups. However, the correlation matrices suggested there was a relationship between the underlying mechanisms of each intervention and the various psychopathological measures. The correlation matrices suggested that those with higher mindful attention and awareness tend to have lower levels of depression, anxiety, anger, disruptive behavior, and stress. The results also yielded that those with high levels of body awareness, meaning those with hypersensitivity to internal bodily functions, have

higher levels of depression, anxiety, anger, disruptive behavior, and stress. Further, participants with high supradiaphragmatic reactivity, meaning those with higher responses of autonomically-innervated organs above the diaphragm, have higher levels of depression, anxiety, anger, and stress. Finally, participants with high subdiaphragmatic reactivity, meaning those with higher responses of automatically innervated organs above the diaphragm, have higher levels of depression, anxiety, anger, disruptive behavior, and stress.

Although mindfulness has produced mixed results, exploring possible reasoning for the lack of an effective intervention is imperative. Kirmayer (2015) explored mindfulness from a cultural standpoint. As previously discussed, mindfulness originated from Buddhist culture and was adapted to Western culture. Kirmayer (2015) discussed in his study the implications of cognitive science and Buddhist studies. He noted that mindfulness has been portrayed as something that is independent of culture and context in the Western world, but due to its beginnings in a religious context, requires “background knowledge, intentions, and aspirations (Kirmayer, 2015, pg. 462).” Therefore, Kirmayer (2015) posits mindfulness may not be effective absent from culture. Removing the Buddhist context from the intervention may lead to misunderstandings in the practice itself. Further, Kirmayer (2015) stated that ignoring context means that we end up with a bland or blind approach to mindfulness that may lack the insight needed to fully make the intervention effective.

Previous literature has explored the underlying mechanisms of both mindfulness and relaxation training. The current literature has found the mechanism for change in relaxation training is ultimately physiological (Conrad & Roth, 2007). Relaxation

training triggers the relaxation response, which the tension and relaxation of the muscles, fire nerve fibers in both systems, which leads to complete relaxation (Conrad & Roth, 2007). Conversely, studies have demonstrated the mechanism for change in mindfulness is cognitive in nature (Isbel & Mahar, 2015; Shapiro, Carlson et al., 2006; Kang et al., 2012; Holas & Jankowski, 2013). These findings help psychologists, and other mental health professionals understand why interventions are effective, which can lead to further developments of effective interventions in the future.

To contribute to this growing body of research, this study investigated whether or not the respective interventions, mindfulness, and relaxation training, caused a change due to the underlying mechanisms associated with each one. The present study had participants in the mindfulness and relaxation training groups, complete rating scales to assess their levels of mindfulness attention and awareness, as well as their body perception, supradiaphragmatic reactivity, and subdiaphragmatic reactivity. It was predicted that the participants in the mindfulness group would have increased levels of mindfulness attention and awareness from pre- to post-treatment, while participants in the relaxation training group would have increased levels of body awareness, supradiaphragmatic reactivity, and subdiaphragmatic reactivity pre- to post-treatment. However, there was no significant difference in either the mechanisms of change in either intervention group. This suggests that the mechanisms of change in the interventions do not differ from one another. So why do these results differ from previous research? Although the mechanisms of mindfulness have been found to be cognitive in nature, there is some debate concerning what cognitive factors specifically underline mindfulness. Although, attention and awareness seem to be the mechanisms most commonly found to

underlying mindfulness, other mechanisms such as intention (Shapiro, Carlson, Astin, & Freedman, 2006), present moment focus (Kang et al., 2012), and decentering (Holas & Jankowski, 2013). Therefore, it is possible that the true underlying mechanisms of mindfulness may differ from what was measured in the current study.

Additional Findings. In addition to investigating the above hypotheses, the data also investigated how at-home practice would influence the effectiveness of each intervention. Results yielded no significant change between participants who practiced consistently and those that did not. However, it should be noted that no single participant practiced every week. Therefore, it is possible at-home practice could have yielded significant results if at-home practice was more consistent. In the current study, the participants were also asked to complete the Working Alliance Inventory to assess how well they related to the intervention. There was a difference between groups in how well they related to therapy, this suggests, the participants related to both interventions equally.

Strengths and Limitations

Though not without limitation, one strength of the present study is that it further explored the effectiveness of two commonly used interventions in an adolescent sample. As psychopathology in adolescence has grown over the past decade, investigating what interventions would be effective is pertinent. Further, the current study attempted to adapt interventions feasibly in a school setting. As the need for mental health interventions among adolescents grows, it is ever important that the field of school psychology continues to find ways to integrate effective interventions in schools. This study also attempted to explore not only which intervention provides significant outcomes, but why

they work. Investigating the underlying mechanisms in interventions is important in developing and effective interventions.

Despite its strengths, this study was not without its limitations. One limitation of the study was that the method of data collection. The participant's measures of anxiety, depression, anger, self-concept, stress, and academic improvement were all obtained through self-report measures. To gain a better idea of the student's true levels of functioning, teacher and parents reports, as well as academic records, could have been obtained. This is due to the fact that student's may minimize symptoms due to the observer's effect. Although this author did not work directly with any of the students in the school and the students were told their identities would be kept confidential, the fact that this author was an extern at the school they attended may have impacted how they scored themselves. Another limitation was that due to permissions from the school, the author was only allowed to recruit participants from certain classes. Therefore, the sample was likely not as diverse as desired.

Another limitation to the present study may have been the dosage of the intervention the participants received. The participants received the intervention for 20 minutes for four weeks, which may not have been enough to result in a significant change. An additional limitation to the study was the scales used to assess the underlying mechanisms of mindfulness and relaxation training. As previously discussed, although attention and awareness are widely considered the mechanisms underlying mindfulness, other mechanisms such as intention (Shapiro et al.,2006), present moment focus (Kang et al.,2012), and decentering (Holas & Jankowski, 2013). Therefore, it is possible that the true underlying mechanisms of mindfulness may differ from what was measured in the

current study. The Body Perception Questionnaire was used to measure the physiological effects of relaxation training. However, a self-report on supradiaphragmatic and subdiaphragmatic reactivity may not have been a reliable measure of how relaxed each participant felt.

A major limitation in this study is the large drop-out rate of participants and subsequently, small sample size. The original sample size yielded 41 participants, and after the participants dropped out, only 27 participants were left. However, even more students declined to participate in the two-month follow-up leaving a sample of only nine participants. Therefore, the small sample size is a substantial limitation to the current study. This significant drop-out rate raises the question of why did so many students decline to participate in the study? A meta-analysis on school-based interventions investigated to what extent students experience stigma due to screening participating in school-based mental health interventions and the consequences of potential stigma for students' engagement with school-based interventions. They found that students reported school-based mental health interventions to be revealing of their mental health status, which lead to negative labeling from peers. They found that students not only believed they would be negatively labeled by peers, but some students internalized feelings of guilt and shame associated with mental health interventions. Additionally, this study found participants expressed concerns that details of their mental health might be divulged to others despite being informed of the limits of confidentiality (Gronholm et al., 2018).

Recommendations for Future Research

As there continues to be a need for evidenced-based practices in schools, it is recommended that this study be replicated taking into consideration the above-mentioned limitations. At minimum future studies should attempt to gain a more substantial sample size to increase the chances of finding a significant change. As discussed above, using various measures to assess psychopathology in adolescents, such as parent and teacher forms, would provide more accurate representation of the participant's mental health. Further, utilizing different measures to assess the underlying mechanisms of mindfulness and relaxation training would also potentially result in variable outcomes from the current study. Another recommendation for future research would be to add an additional group in which the participants receive both mindfulness and relaxation training interventions to see if receiving both treatments results in more significant outcomes.

Future research to encourage more students to be involved in mental health services in schools. As previously discussed, in their meta-analysis Gronholm et al., (2018) found students not only believed they would be negatively labeled by peers, but some students internalized feelings of guilt and shame associated with mental health interventions. Additionally, this study found participants expressed concerns that details of their mental health might be divulged to others despite being informed of the limits of confidentiality. Future studies should not only focus on what students view negatively about mental health services, but also what they view positively to develop interventions that would interest students and increase participation.

Implications for School Psychology

A new and greater understanding of brief interventions could open the door for school psychologists to take preventative action for students, as well as address the concerns of those students suffering from psychopathology. School psychologists could also use this knowledge to educate other school-based mental health professionals on the importance of using effective therapeutic techniques when carrying out interventions with students. Further, this study can also encourage school psychologists to take the initiative to research interventions that would be appropriate for their school setting. As each school harbors a student body with unique backgrounds, socioeconomic statuses, social climates, and mental health concerns, having an understanding of how to research and implement interventions tailored to the students' needs is imperative to effectively promoting mental health in a school setting. Based on their students' needs, school psychologists can acquire ideas from this study on how to effectively research their own brief interventions that can be easily implemented in a school setting.

The current study opens a discussion for the types of interventions school psychologists and other mental health professionals use in practice. The current study did not yield greater significant outcomes than relaxation training or the control group, which was what was hypothesized. This adds to the current research that mindfulness interventions are met with mixed results. With so many different types of therapies and interventions coming into the spotlight, it is pertinent psychologists make themselves aware of what practices are evidenced-based and will produce results when treating clients. Mindfulness is an intervention that has received growing popularity in the past decade. However, is mindfulness just a fad? Shonin et al., (2015) published an editorial

in which they discuss the concerns of the growing use of mindfulness merely being a fad. They explain that mindfulness studies often fail to control for a placebo effect. Further, they discuss how an organization such as the Australian and New Zealand College of Psychiatrists added mindfulness as an intervention in their practice guidelines as a treatment for eating disorders in adults despite there being insufficient evidence for its effectiveness for such a disorder in randomized clinical trials. Shonin et al., (2015) also posit this to the “popularity effect.” Further, they suggest the growing popularity of mindfulness could mean outcomes may be influenced due to participants’ beliefs they are receiving a “fashionable” technique. However, the authors indicate controlling for participants believing an intervention is popular would be difficult, and to his author’s knowledge, no peer-reviewed articles on the subject currently exist. However, the purpose of this discussion point is that it is the duty of mental health professionals to utilize interventions based on outcomes of the current research, and not to utilize what is popular.

Conclusion

As children emerge into adolescence, they experience significant changes in their emotional and cognitive functioning. Current research indicates the rates at which adolescents suffer from psychopathology has been increasing. Therefore, the aim of this study was to research two interventions, mindfulness and relaxation training, on an adolescent sample. This study also examined the underlying mechanisms of these two interventions to see if they truly differed.

The results of this study indicated there was no significant difference between the mindfulness, relaxation training, and control groups for any of the facets assessed which

included depression, anxiety, anger, self-concept, stress, and disruptive behavior. Further, there was no significant difference from pre-treatment to post-treatment among any groups for any of the underlying mechanisms assessed. This could likely be due to the very small sample size due to high participant drop-out rates. However, conclusions can be drawn among these non-significant outcomes. The results indicate that mindfulness did not have greater outcomes than the relaxation training intervention, nor did the relaxation training intervention have greater outcomes than the control group. These results may indicate that neither brief intervention is an effective treatment for adolescents. The current study also demonstrated mindfulness and relaxation training did not differ in the underlying mechanisms assessed. These results suggest there may be no underlying difference between the two interventions, or perhaps further research is needed to investigate the true underlying mechanisms of the interventions.

Developing effective and feasible interventions in a school setting is a goal that is both complex and challenging. The current study generated several ideas associated when developing effective interventions for adolescents in a school system. Firstly, there is the idea of student engagement. The current study demonstrated how difficult it could be to garner student engagement and participation in mental health services. Gronholm et al., (2018) found in their study that adolescents are reluctant to engage in the treatment, which also appeared evident in the current study. Further, this study raises a discussion about the potential of utilizing interventions merely because they are popular. School psychologists should always be making their best effort to keep themselves updated on the current literature so they can ensure they are employing evidenced-based practices to effectively and treat today's youth.

Appendix A



Invitation to Participate in a Research Study

I would like to invite you to take part in a research study to learn more about mindfulness and relaxation training interventions for adolescents. This study will be conducted by me, Lana Tenaglia, M.S., within the School Psychology Department at St. John's University as part of my doctoral dissertation. My faculty sponsor is Dr. Raymond DiGiuseppe, of the St. John's University School Psychology Department. If you agree to be in this study, you will be asked to do the following:

1. Complete two to three questionnaires about your current mental health status. These questionnaires will also ask you questions about your background (age, gender, education, etc.)
2. Participate in either a brief mindfulness or relaxation training intervention and
3. Track your practice of the respective intervention each week.

Participation in this study will run over the course of four weeks. It will involve approximately 20 minutes to complete the questionnaires the first and last week and approximately 40 minutes each week for the intervention. The study also includes 10 minutes of practice each day over the course of four weeks.

There are no known risks associated with your participation in this research beyond those of everyday life.

Although you will receive no direct benefits, this research may help the investigator better understand the use of brief interventions for adolescents in a school setting and teach the participants interventions which may benefit their mental health.

Confidentiality of your research records will be strictly maintained by using codes to deidentify all data and keeping consent forms separate from data to make sure that the subject's name and identity will not become known or linked with any information they have provided. Further, all forms completed will be kept in a locked draw to keep it protected. Your responses will be kept confidential with the following exception: the

researcher is required by law to report to the appropriate authorities, suspicion of harm to yourself, to children, or to others.

Participation in this study is voluntary. You may refuse to participate or withdraw at any time without penalty. For interviews, questionnaires or surveys, you have the right to skip or not answer any questions you prefer not to answer.

Nonparticipation or withdrawal will not affect your grades or academic standing.

If you are interested in participating in the study please contact me for parental consent and informed consent forms which need to be returned to me before you can participate in the study. Further, if there is anything about the study or your participation that is unclear or that you do not understand, or if you have questions or wish to report a research-related problem, you may contact me, Lana Tenaglia, at (516) 860-800-5414 or at Lana.Tenaglia14@gmail.com.

Appendix B



Parental Permission Form to Participate in a Research Study

Your child has been invited to take part in a research study to learn more about mindfulness and relaxation training interventions for adolescents. This study will be conducted by Lana Tenaglia, M.S. within the School Psychology Department at St. John's University as part of her doctoral dissertation. Her faculty sponsor is Dr. Raymond DiGiuseppe, of the St. John's University School Psychology Department. If you give permission for your child's participation in this study, your child will be asked to do the following:

1. Complete two to three questionnaires about your current mental health status. These questionnaires will also ask questions about your child's background (age, gender, education, etc.). The questionnaires will also ask your child about their orientation to the intervention.
2. Participate in either a brief mindfulness or relaxation training intervention and
3. Track your child's practice of the respective intervention each week.

Participation in this study will run over the course of four weeks. It will involve approximately 20 minutes to complete the questionnaires the first and last week and approximately 40 minutes each week for the intervention. The study also includes 10 minutes of practice each day over the course of four weeks. They will also be asked to complete the questionnaires again two months after the intervention.

There are no known risks associated with your participation in this research beyond those of everyday life.

Although you will receive no direct benefits, this research may help the investigator better understand the use of brief interventions for adolescents in a school setting.

Confidentiality of your child's research records will be strictly maintained by using codes to deidentify all data and keeping consent forms separate from data to make sure that the subject's name and identity will not become known or linked with any information they have provided. Further, all forms completed will be kept in a locked draw to keep it protected. Your child's responses will be kept confidential with the

following exception: the researcher is required by law to report to the appropriate authorities, suspicion of harm to yourself, to children, or to others.

Participation in this study is voluntary. Your child may refuse to participate or withdraw at any time without penalty. For interviews, questionnaires or surveys, your child has the right to skip or not answer any questions he/she prefers not to answer. Nonparticipation or withdrawal will not affect your child's grades or academic standing.

If there is anything about the study or your child's participation that is unclear or that you do not understand, if you have questions or wish to report a research-related problem, you may contact Lana Tenaglia, M.S. at (860) 800-5414, Lana.Tenaglia14@gmail.com, St. John's University, 8000 Utopia Parkway, Jamaica, New York 11439 or the faculty sponsor, Dr. Raymond DiGiuseppe at 718-990-1955, diguiser@stjohns.edu, St. John's University, 8000 Utopia Parkway, Jamaica, New York 11439.

For questions about your rights as a research participant, you may contact the University's Institutional Review Board, St. John's University, Dr. Raymond DiGiuseppe, Chair diguiser@stjohns.edu 718-990-1955 or Marie Nitopi, IRB Coordinator, nitopim@stjohns.edu 718-990-1440.

You have received a copy of this parental permission form to keep.

Permission to Participate

Name of Child

Parent's Signature

Date

Appendix C



Consent to Participate in a Research Study

You have been invited to take part in a research study to learn more about mindfulness and relaxation training interventions for adolescents. This study will be conducted by Lana Tenaglia, M.S. within the School Psychology Department at St. John's University as part of her doctoral dissertation. Her faculty sponsor is Dr. Raymond DiGiuseppe, of the St. John's University School Psychology Department. If you agree to be in this study, you will be asked to do the following:

1. Complete five questionnaires about your current mental health status. These questionnaires will also ask you questions about your background (age, gender, education, etc.). Further they will ask you about your orientation to the intervention.
2. Participate in either a brief mindfulness or relaxation training intervention and
3. Track your practice of the respective intervention each week.

Participation in this study will run over the course of four weeks. It will involve approximately 20 minutes to complete the questionnaires the first and last week and approximately 40 minutes each week for the intervention. The study also includes 10 minutes of practice each day over the course of four weeks. Further, you will be asked to complete the questionnaires again two months after the completion of the intervention.

There are no known risks associated with your participation in this research beyond those of everyday life.

Although you will receive no direct benefits, this research may help the investigator better understand the use of brief interventions for adolescents in a school setting and teach the participants interventions which may benefit their mental health.

Confidentiality of your research records will be strictly maintained by using codes to deidentify all data and keeping consent forms separate from data to make sure that the subject's name and identity will not become known or linked with any information they have provided. Further, all forms completed will be kept in a locked draw to keep it protected. Your responses will be kept confidential with the following exception: the

researcher is required by law to report to the appropriate authorities, suspicion of harm to yourself, to children, or to others.

Participation in this study is voluntary. You may refuse to participate or withdraw at any time without penalty. For interviews, questionnaires or surveys, you have the right to skip or not answer any questions you prefer not to answer.

Nonparticipation or withdrawal will not affect your grades or academic standing. If you choose to participate in the study, you can drop out of the study at any time.

If there is anything about the study or your participation that is unclear or that you do not understand, if you have questions or wish to report a research-related problem, you may contact Lana Tenaglia at (860) 800-5414 or at Lana.Tenaglia14@gmail.com, St. John's University, 8000 Utopia Parkway, Jamaica, New York 11439 or the faculty sponsor, Dr. Raymond DiGiuseppe at 718-990-1955, diguiser@stjohns.edu, St. John's University, 8000 Utopia Parkway, Jamaica, New York 11439.

For questions about your rights as a research participant, you may contact the University's Institutional Review Board, St. John's University, Dr. Raymond DiGiuseppe, Chair diguiser@stjohns.edu 718-990-1955 or Marie Nitopi, IRB Coordinator, nitopim@stjohns.edu 718-990-1440.

You have received a copy of this consent document to keep.

Agreement to Participate

Subject's Signature

Date

PERCEIVED STRESS SCALE

The questions in this scale ask you about your feelings and thoughts during the last month.

In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Name _____

Age _____

Gender (Circle): M F

0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly Often	4 = Very Often
1.	In the last month, how often have you been upset because of something that happened unexpectedly?	0	1234	
2.	In the last month, how often have you felt that you were unable to control the important things in your life?	0	1234	
3.	In the last month, how often have you felt nervous and "stressed"?	0	1234	
4.	In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1234	
5.	In the last month, how often have you felt that things were going your way?	0	1234	
6.	In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1234	
7.	In the last month, how often have you been able to control irritations in your life?	0	1234	
8.	In the last month, how often have you felt that you were on top of things?	0	1234	
9.	In the last month, how often have you been angered because of things that were outside of your control?	0	1234	
10.	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1234	

Appendix E

The Mindful Attention Awareness Scale (MAAS)

The trait MAAS is a 15-item scale designed to assess a core characteristic of mindfulness, namely, a receptive state of mind in which attention, informed by a sensitive awareness of what is occurring in the present, simply observes what is taking place.

Brown, K.W. & Ryan, R.M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*, 822-848.

Carlson, L.E. & Brown, K.W. (2005). Validation of the Mindful Attention Awareness Scale in a cancer population. *Journal of Psychosomatic Research, 58*, 29-33.

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5	6
					almost
almost	very	somewhat	somewhat	very	never
always	frequently	frequently	infrequently	infrequently	
_____	I could be experiencing some emotion and not be conscious of it until some				
	1.time				
	later.				
_____	I break or spill things because of carelessness, not paying attention, or				
	2.thinking of				
	something else.				
_____	I find it difficult to stay focused on what’s happening in the				
	3.present.				
_____	I tend to walk quickly to get where I’m going without paying attention to				
	4.what I				
	experience along the way.				
_____	I tend not to notice feelings of physical tension or discomfort until they				
	5.really grab				
	my attention.				
_____	6.I forget a person’s name almost as soon as I’ve been told it for the first time.				
_____	It seems I am “running on automatic,” without much awareness of what I’m				
	7.doing.				
_____	8.I rush through activities without being really attentive to them.				

- I get so focused on the goal I want to achieve that I lose touch with what
- _____ 9. I'm doing
right now to get
there.
- _____ 10. I do jobs or tasks automatically, without being aware of what I'm doing.
I find myself listening to someone with one ear, doing something else at the
- _____ 11. same
time.
I drive places on 'automatic pilot' and then wonder why I went
- _____ 12. there.
I find myself preoccupied with the future or the
- _____ 13. past.
I find myself doing things without paying
- _____ 14. attention.
- _____ 15. I snack without being aware that I'm eating.

Appendix F

Body Perception Questionnaire Short Form

Stephen W. Porges © 1993, 2015

I. Body Awareness

Please rate your awareness on each of the characteristics described below. Select the answer that most accurately describes you.

During most situations I am aware of:

		Never	Occasionally	Sometimes	Usually	Always
1	Swallowing frequently	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	An urge to cough to clear my throat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	My mouth being dry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	How fast I am breathing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	Watering or tearing of my eyes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Never	Occasionally	Sometimes	Usually	Always
6	Noises associated with my digestion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	A swelling of my body or parts of my body	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	An urge to defecate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	Muscle tension in my arms and legs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	A bloated feeling because of water retention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

		Never	Occasionally	Sometimes	Usually	Always
12	Goose bumps					
13	Stomach and gut pains	0	0	0	0	0
14	Stomach distension or bloatedness	0	0	0	0	0
15	Palms sweating	0	0	0	0	0
16	Sweat on my forehead	0	0	0	0	0
17	Tremor in my lips	0	0	0	0	0
18	Sweat in my armpits	0	0	0	0	0
19	The temperature of my face (especially my ears)	0	0	0	0	0
20	Grinding my teeth	Never	Occasionally	Sometimes	Usually	Always
21	General jitteriness	0	0	0	0	0
22	The hair on the back of my neck "standing up"	0	0	0	0	0
23	Difficulty in focusing	0	0	0	0	0
24	An urge to swallow	0	0	0	0	0
25	How hard my heart is beating	0	0	0	0	0
26	Feeling constipated	0	0	0	0	0
		0	0	0	0	0

II. Autonomic Nervous System Reactivity

The autonomic nervous system is the part of your nervous system that controls your cardiovascular, respiratory, digestive, and temperature regulation systems. It is also involved in the experience and expression of emotions. The autonomic nervous system functions differently among people. This scale has been developed to measure how your autonomic nervous system reacts.

Please rate yourself on each of the statements below:

		Never	Occasionally	Sometimes	Usually	Always
27	I have difficulty coordinating breathing and eating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28	When I am eating, I have difficulty talking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29	My heart often beats irregularly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30	When I eat, food feels dry and sticks to my mouth and throat.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31	I feel shortness of breath.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Never	Occasionally	Sometimes	Usually	Always
32	I have difficulty coordinating breathing with talking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33	When I eat, I have difficulty coordinating swallowing, chewing, and/or sucking with breathing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34	I have a persistent cough that interferes with my talking and eating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35	I gag from the saliva in my mouth.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36	I have chest pains.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

		Never	Occasionally	Sometimes	Usually	Always
37	I gag when I eat.					
38	When I talk, I often feel I should cough or swallow the saliva in my mouth.	0	0	0	0	0
39	When I breathe, I feel like I cannot get enough oxygen.	0	0	0	0	0
40	I have difficulty controlling my eyes.	0	0	0	0	0
41	I feel like vomiting	0	0	0	0	0
		0	0	0	0	0
42	I have 'sour' stomach.	Never	Occasionally	Sometimes	Usually	Always
43	I am constipated	0	0	0	0	0
44	I have indigestion.	0	0	0	0	0
45	After eating I have digestive problems.	0	0	0	0	0
46	I have diarrhea	0	0	0	0	0
		0	0	0	0	0
		Never	Occasionally	Sometimes	Usually	Always

Appendix G

Working Alliance Inventory – Short Revised (WAI-SR)

Instructions: Below is a list of statements and questions about experiences people might have with their therapy or therapist. Some items refer directly to your therapist with an underlined space -- as you read the sentences, mentally insert the name of your therapist in place of _____ in the text. Think about your experience in therapy, and decide which category best describes your own experience.

IMPORTANT!!! Please take your time to consider each question carefully.

1. As a result of these sessions I am clearer as to how I might be able to change.

① ② ③ ④ ⑤

Seldom Sometimes Fairly Often Very Often Always

2. What I am doing in therapy gives me new ways of looking at my problem.

⑤ ④ ③ ② ①

Always Very Often Fairly Often Sometimes Seldom

3. I believe____likes me.

① ② ③ ④ ⑤

Seldom Sometimes Fairly Often Very Often Always

4. ____and I collaborate on setting goals for my therapy.

① ② ③ ④ ⑤

Seldom Sometimes Fairly Often Very Often Always

5. ____and I respect each other.

⑤ ④ ③ ② ①

Always Very Often Fairly Often Sometimes Seldom

6. ____and I are working towards mutually agreed upon goals.

⑤ ④ ③ ② ①

Always Very Often Fairly Often Sometimes Seldom

7. I feel that____appreciates me.

① ② ③ ④ ⑤

Seldom Sometimes Fairly Often Very Often Always

8. ____ and I agree on what is important for me to work on.

⑤ ④ ③ ② ①

Always Very Often Fairly Often Sometimes Seldom

9. I feel ____ cares about me even when I do things that he/she does not approve of.

① ② ③ ④ ⑤

Seldom Sometimes Fairly Often Very Often Always

10. I feel that the things I do in therapy will help me to accomplish the changes that I want.

⑤ ④ ③ ② ①

Always Very Often Fairly Often Sometimes Seldom

11. ____ and I have established a good understanding of the kind of changes that would be good for me.

⑤ ④ ③ ② ①

Always Very Often Fairly Often Sometimes Seldom

12. I believe the way we are working with my problem is correct.

① ② ③ ④ ⑤

Seldom Sometimes Fairly Often Very Often Always

Note: Items copyright © Adam Horvath. Goal Items: 4, 6, 8, 11; Task Items: 1, 2,

10, 12; Bond Items: 3, 5, 7, 9

Appendix H



Ratings of Investigator Implementation of Interventions

Video:

1) How would you rate the investigator's enthusiasm?

Not very Enthusiastic

Enthusiastic

Very Enthusiastic

2) How confident did the investigator appear to be in the intervention?

Not very confident

Confident

Very Confident

3) How would you rate the investigator's attitude towards the intervention?

Negative

Neutral

Positive

4) How would you rate the investigator's level of interest in the intervention?

Not very Interested

Interested

Very Interested

Appendix I



Tracking Practice

Please answer the following questions in regards to how often you practiced this week.
Please be as honest as possible.

How many times did you practice this week?

0 1 2 3 4 5 6 7 >8

About how many minutes did you practice each day?

0 5 10 15 20 25 30 >30

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