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Examination of the Effects of Computer Assisted Mindfulness Strategies with Adolescents in an Alternative High School Setting

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EXAMINATION OF THE EFFECTS OF COMPUTER ASSISTED MINDFULNESS STRATEGIES WITH ADOLESCENTS IN AN ALTERNATIVE HIGH SCHOOL SETTING

by

Justin A. Moore

A dissertation submitted to the Graduate College in partial fulfillment of the requirements for the degree of Doctor of Philosophy Psychology Western Michigan University August 2017

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EXAMINATION OF THE EFFECTS OF COMPUTER ASSISTED MINDFULNESS STRATEGIES WITH ADOLESCENTS IN AN ALTERNATIVE HIGH SCHOOL SETTING

Justin A. Moore, Ph.D.
Western Michigan University, 2017

Based on growing evidence that suggests mindfulness practices may improve psychological functioning, recent decades have seen a surge in mindfulness interventions and the use of technology as a means for teaching them. The primary purpose of this study was to examine the effects of four weeks of (twice weekly) training sessions using two computer-based strategies for teaching mindfulness-related skills to adolescents. The strategies included Breath Counting Training (BCT; Levinson et al., 2014) and Self-Compassion Training (SCT; Weng et al., 2013; Alberston, Neff, and Dill-Shackleford, 2014). Twenty adolescents (M age = 17.30; 40% male, 55% female, 5% gender neutral; 60% African American, 15% Multi-Racial/Ethnic, 15% Euro-American, and 10% Latinx) recruited from an alternative high school were randomly assigned to one of four conditions: (1) BCT for four sessions, followed by four sessions of SCT, (2) SCT for four sessions, followed by four sessions of BCT, (3) BCT for eight sessions, or (4) SCT for eight sessions. Subjective ratings of current mindful awareness and self-compassion were taken at the conclusion of each 10-15 minute session. The Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer, & Smith, 2011) and the Self-Compassion Scale Short-Form (SCS; Raes, Pommier, Neff, and Gucht, 2011) were collected prior to participation, prior to each session, and at post-intervention. The Depression Anxiety and Stress Scale-21
(DASS; Lovibond & Lovibond, 1995) was collected at the beginning, middle, and conclusion of participation. Both BCT and SCT sessions were associated with moderate and equal levels of immediate post-session felt experience of mindful awareness and self-compassion. Eight sessions of BCT, SCT, or their combination was associated with improvements on the CAMM and SCS, but not the DASS-21. Receipt of BCT versus SCT did not produce reliably different effects on overall mindfulness or self-compassion. Individual level analysis showed significant variability in responses across conditions and participants. While unique in their focus, both computerized trainings—breath counting and self-compassion—showed some promise in promoting the acquisition and practice of mindfulness skills by teens. However, unlike findings from other reports in the literature, delivery of mindfulness training was not associated with reductions in psychological distress. It is possible that 4 weeks (eight brief sessions offered twice weekly) and lack of home practice is insufficient to produce a measured global change in coping. Consistent with this interpretation, despite regular attendance and engagement during the twice weekly proctored meetings, assigned out of school home practice with the training materials did not reliably occur.
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Justin A. Moore
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INTRODUCTION

The Importance of Mindfulness

Over the last 30 years, science has focused its lens of analysis on the practice of mindfulness, yet uniformity of its practice or its definition remain ambiguous. Overall, mindfulness intervention appears to be a powerful tool that has produced positive change linked to physical and emotional well-being outcomes (Eberth & Sedlmeier, 2012). There has been a surge of mindfulness interventions over the past few decades. While there is not one universally accepted definition of mindfulness, there is general agreement that it involves self-regulation of attention to an individual’s current experiences (Baer, 2003; Bishop et al., 2004; Kabat-Zinn, 1994; Segal, Williams, & Teasdale, 2002; Tan & Martin, 2015).

Mindfulness-based programs have been shown to positively influence psychological functioning in adults, yet there still remains a paucity of adolescent mindfulness-based research (Tan, 2015). It is imperative that more research is conducted with mindfulness and adolescents, particularly using appropriate mindfulness measures (Tan, 2015). Exploration of the current evidence for mindfulness interventions for adolescents in clinical settings and schools, seem to lack methodological rigor, and studies to date contain less than ideal research designs.

The quintessence of mindfulness is self-regulation of attention, which is apparent in work by Kabat Zinn (2003) who described mindfulness as, “paying attention on purpose, in the present moment, and nonjudgmentally, to the unfolding of experience moment by moment” (p. 145). Bishop et al. (2004) explains mindfulness as: a) self-regulation of attention and maintaining it on immediate experience; and b) a particular orientation towards this immediate experience to include acceptance, curiosity, and openness (Bishop et al., 2004).
A behavioral perspective posits that self-regulation of attention to present moment experience can be understood as a type of selective stimulus control; that is, enhancing the discriminative control of internal stimuli for observing responses. Responding non-judgmentally, or openly, involves minimizing the influence of verbal processes (Hayes & Shenk, 2004), such as letting go or holding lightly of self-thoughts (covert verbal behavior) evaluating what felt experiences mean or whether they are verbally identified good or bad. Thus, one goal of mindfulness interventions is to foster contact with current environmental (both external and internal) stimuli and consequences while reducing control by extraneous verbal behavior.

As research, training, and clinical practice of mindfulness increase, various types of mindfulness practices have emerged. One new promising mindfulness construct with preliminary empirical support is self-compassion. Self-Compassion was first operationalized by Neff (2003) who reported that it is made-up of three components: kindness, common humanity, and mindfulness. Self-kindness is encountering our own distress in a way that is tender, understanding, and soothing, along with the desire to alleviate our suffering (MacBeth & Gumley, 2012; Neff, 2003b; Vettese, Dyer, Li, & Wekerle, 2011; Batson, 1991; Eisenberg, Fabes, & Spinrad, 2006; Goetz, Keltner, & Simon-Thomas, 2010; Neff, 2003; Weng et al., 2013; Neff & Dahm, 2015). Common humanity is the understanding that being human is being imperfect, and embracing the notion that everyone eventually fails, makes errors, and engages in erroneous decisions and behaviors (Neff & Dahm, 2015). Mindfulness from a self-compassion lens is narrower in focus than general mindfulness. Here mindfulness is conceptualized as mindful awareness of negative experiences such as aversive emotions, feelings, and thoughts (Neff & Dahm, 2015). Generally, mindfulness outside the context of self-compassion is
awareness of and attention towards present moment experiences, not just the negative ones (Neff & Dahm, 2015).

**Empirical Review of Mindfulness**

There is a proliferation of empirical publications, including randomized controlled trials, summarized in systematic reviews and meta-analyses, supporting the efficacy and effectiveness of mindfulness approaches for physical and mental health (Bostic, Nevarez, Potter, Prince, Benningfield, and Aguirre, 2015; Tan, 2015; Zenner, Hernleben, & Walach, 2014; Zoogman, Goldberg, Hoyt, & Miller, 2014). While the origins of mindfulness practice date back significantly longer, its prominence in the Western scientific community can be traced to Kabat-Zinn’s (1982) seminal study. This study was conducted with an adult sample using a pre-post design to examine a 10-week mindful meditation program called Mindfulness-Based Stress Reduction (MBSR). The MBSR program consists of one 2.5-3 hour weekly group session, daily homework practice, and one all day retreat. The content of the MBSR program included formal mindfulness meditation practices, cultivation of a non-judgmental attitude towards participants’ experiences, and application of mindfulness to everyday activities. Participants in this study were 51 patients experiencing chronic pain that did not respond to customary medical treatment. Following the mindfulness meditation treatment program, participants had significant reductions in overall perceived pain. Relevant for the present purposes, when teaching MBSR the researchers began with the mindfulness meditation technique of having participants focus on their breath (Kabat-Zinn, 1982). This was done because it was considered easier for participants to begin their mindfulness training with their own breath, since it is ever present (Kabat-Zinn, 1990).
Emerging research suggests that adolescents may benefit from mindfulness trainings (Zoogman, Goldberg, Hoyt, & Miller, 2014). These mindfulness trainings with youth have been found to produce increased awareness, adaptive responding, and decreased psychological distress. Tan and Martin (2015) conducted a study that randomized 108 adolescents to treatment as usual (independent clinic based therapy) or treatment as usual plus five weeks of mindfulness training. Measuring mindfulness using the Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer, & Smith, 2011) and distress using the Depression Anxiety and Stress Scale-21 (DASS; Lovibond & Lovibond, 1995), the authors found significant group by time interactions favoring the mindfulness training condition on both the CAMM and DASS-21. Moreover, changes in mindfulness statistically mediated the mental health improvements.

Quach, Gibler, and Jastrowski Mano (2017) conducted a randomized controlled trial with an adolescent sample comparing mindfulness meditation including breathing techniques, meditation, and discussion to hatha yoga including breathing techniques, yoga poses, and discussion. Findings suggest that participants were more likely to comply with hatha yoga homework (i.e., DVD guided home practice of breathing techniques and hatha yoga poses for 15-30 minutes) and less likely to comply with mindfulness meditation homework (i.e., CD audio led home practice on breathing technique and mindfulness meditation for 15-30 minutes). For participants who were significantly more compliant with home practice in the hatha yoga condition, their perceived stress significantly decreased. However, for those who were less compliant with their home practice, their perceived stress actually increased (Quach, Gibler, & Jastrowski Mano, 2017).

In line with support for mindfulness with youth, Wisner and Starzec (2016) reported positive results in their qualitative study implementing a 7-month mindfulness program in an
alternative school. The study was conducted with adolescents ($N = 19$; 10 males, 9 females, ages 15-17) in a compensatory alternative school that has 35-50 students in the 10th – 12th grades, and students were located in a rural low socio-economic community in the northeast. Winser and Starzec (2016) integrated mindfulness training curriculum included meeting twice a week and learning to be mindful of their breath, and the broad range of sensations experienced when seating, walking, and laying down. The results suggested that among the 14 who completed the 7-month program there were improvements in emotion and behavioral regulation skills, relationship building skills, and their ability to trust. Braun, Levy, Collins, and Mogilner (2014) conducted a pre-post design exploring a mindfulness study with 14 adolescent females in a lower socio-economic urban setting of East Harlem. They found that ten weekly sessions of mindfulness including yoga, mindfulness meditation, and healthy eating decreased stress measured by the Perceived Stress Scale (PSS; Cohen, 1988). Findings also suggest that the mindfulness program increased coping skills of a high-risk urban adolescent sample (Braun et al., 2014).

Jennings and Jennings (2013) conducted a pilot study with eight adolescent high school seniors (five males and three females), that used a tailored mindfulness meditation training for adolescents (Apsche & Jennings, 2013). The training adapted a weekly 2.5-hour session for adults, administered over eight weeks, to 50-minute sessions (consisting of breath counting and guided imagery) four times over three weeks (Apsche & Jennings, 2013). Findings suggested that an abbreviated four session mindfulness meditation program administered over a three-week period for adolescents reduced self-reported stress, and general anxiety measured by the Beck Anxiety Scale (Beck, Epstein, Brown, & Steer, 1988).
Systematic Reviews

Burke (2009) provided a positive preliminary review of mindfulness-based approaches with children and adolescents which suggested that mindfulness-based interventions may be a viable option for youth. The review involved 15 studies, wherein eight studies had high school aged participants. The review covered interventions that use mindfulness meditation as a core tool. Aligned with Burke’s (2009) findings, Meiklejohn et al. (2012) conducted a systematic review of mindfulness trainings in the K-12 educational settings. They found three studies suggesting mindfulness trainings with teachers influence increased capacity to preserve supportive relationships with students, ability to manage classrooms, teacher well-being, and teacher self-efficacy. Across 14 studies assessing mindfulness trainings with youth, six studies were with elementary school children, and eight studies with high school students. The findings show improvements in attention, social skills, self-esteem, working memory, academic skills, emotion regulation, self-reported improvement in mood, a decrease in fatigue, stress, and anxiety. These findings illuminate the need for more rigorous exploration of mindfulness as an approach with youth for academic success and well-being.

Another systematic review was conducted by Harnett and Dawe (2012) examining 24 studies, where nine were pre-post studies, one was a quasi-experimental study, one was a multiple baseline study, one was a uncontrolled pilot study, and one was a RCT, all involving mindfulness based therapies with children, adolescents, and families. Findings suggest that mindfulness based skills are potentially beneficial in helping children reach more positive developmental outcomes (Harnett & Dawe, 2012). This was reached through mindfulness training, which influenced cultivation of greater mastery of attention, emotion regulation, and improvements in family relationships. The authors argue, that implementing mindfulness
trainings directly with children, adolescents, and families compared to implementing mindfulness trainings solely with parents yielded better outcomes (Harnett & Dawe, 2012). However, larger methodologically rigorous studies were absent during their review. Understanding mindfulness trainings and its effects on outcomes with youth would benefit from large-scale methodologically rigorous investigations. Scholars would additionally benefit from the study of possible mechanisms of action to better understand the active ingredients in treatments they provide.

Tan (2015) contributed to the literature supporting mindfulness by conducting a critical review of adolescent mindfulness programs since Burke’s (2009) systematic review. Tan (2015) concluded that in 12 studies identified, six were clinical interventions including mindfulness and six were school-wide mindfulness programs (aged 12-19 years) and only one was a randomized controlled trial, which used the Child and Adolescent Mindfulness Measure (CAMM short version; Greco, Baer, & Smith, 2011) and the Depression, Anxiety, Stress Scale (DASS-21; Lovibond & Lovibond, 1995) as outcome measures. These available systematic reviews are informative, but are not definitive. The literature is not such that there is adequate information to fully support the efficacy of mindfulness-based interventions for youth.

**Meta-analyses**

The first published meta-analytic study on mindfulness interventions with youth analyzed 20 published studies between 2004 and 2011; 13 of these studies were randomized controlled trials (Zoogman, Goldberg, Hoyt, & Miller, 2014). Findings indicate most mindfulness interventions with youth are conducted in groups, have not produced harm, and seem potentially beneficial. Mindfulness interventions compared to active controls have produced small to moderate effect sizes in attention and mindfulness, moderate effect sizes for psychological
symptoms, and demonstrated bigger effects with clinical samples compared to non-clinical samples (Zoogman, Goldberg, Hoyt, & Miller, 2014). Furthermore, Zoogman, Goldberg, Hoyt, & Miller (2014) reported for the first time reviewing five studies (Bogels, Hoogstad, van Dun, de Schutter, & Restifo, 2008; Huppert & Johnson, 2010; Napoli, Krech, & Holley, 2005; Semple, Lee, Rosa, & Miller, 2010; Zylowska et al., 2008) that mindfulness interventions were shown to directly increase attention and mindfulness in youth.

Zenner, Hernleben, and Walach (2014) examined mindfulness based interventions in schools finding that they have been well received in this setting. This investigation examined 24 studies, where 13 were published, and 19 studies used a controlled design. Overall, 1,348 participants received some type of mindfulness training and 876 students served as controls. These studies explored mindfulness interventions with students ranging from 1st grade to 12th grade. Fifteen of these studies explored included high school aged youth. The mindfulness treatment durations ranged from four weeks to 24 weeks with the median being eight weeks. Most treatments involved meeting once a week for 45 minutes. The total time used for programs ranged from 160 to 3,700 minutes, and the median was 420 minutes (Zenner, Hernleben, & Walach, 2014). Zenner et al.’s (2014) results suggested mindfulness trainings increased attention and learning and, as such, might contribute to resiliency in the face of stress (Bostic, Nevarez, Potter, Prince, Benningfield, & Aguirre, 2015; Zenner, Hernleben, & Walach, 2014). Mindfulness interventions have also been postulated to lead to neurobiological changes in response to distress that support psychological health as well (Bostic et al., 2015; Flook, Goldberg, Pinger, and Davidson, 2015). Mindfulness has been shown to be beneficial to youth regardless of gender or race (Bluth, Roberson, & Gaylord, 2015; Broderick & Metz, 2009; Raes, Pommier, Neff & Gucht, 2011; Sibinga, Perry-Parrish, Chung, Johnson, Smith, and Ellen, 2013).
Putting all of this together suggests that schools may provide a productive venue for conducting mindfulness interventions since youth spend most time in school (Zenner, Hernleben, & Walach, 2014).

Though mindfulness seems promising for influencing well-being, the active ingredients of mindfulness interventions are not well understood or researched. For instance, Bluth & Blanton (2014) conducted a study with 67 high school students between the 9th and 12th grade to explore methods to influence well-being. The participants in this study completed five measures: CAMM (Greco et al., 2011), Positive Affect Negative Affect Scale (PANAS; Watson, Clarck, & Tellegen, 1988), Self-Compassion Scale (SCS; Neff, 2003), Student’s Life Satisfaction Scale (SLSS; Huebner, 1991), and Perceived Stress (PSS; Cohen et al., 1983). A mediator analysis was conducted to explore possible pathways to well-being. Bluth and Blanton’s (2014) findings suggest mindfulness partially mediates the relationship between self-compassion and life satisfaction. Self-Compassion partially mediated the relationship between mindfulness and negative affect, and mediated the relationship between mindfulness and perceived stress (Bluth & Blanton, 2014). This suggests that self-compassion and mindfulness are interconnected and can help with emotional well-being. Given that adolescence is a difficult developmental time, exposure to mindfulness and self-compassion techniques may promote their emotional well-being (Bluth & Blanton, 2014).

**Efficacy of a Behavioral Measure of Mindfulness**

As interest in and evidence in support of mindfulness trainings has increased, methods of measuring mindfulness have also grown as a topic of interest. Levinson, Stoll, Kindy, Merry, and Davidson (2014) operationalized mindfulness as “present moment awareness” (p. 1). These authors conducted four independent studies with an overall sample of approximately 400 adults
providing the first construct validation of a behavioral measure of mindfulness, which they referred to as breath counting training (BCT). Study one examined the convergent, criterion, discriminant, and incremental validity of the breath counting training. This was accomplished by examining the association between BCT and state meta-awareness, working memory, trait mindfulness, and mind wandering. The findings supported BCT as a behavioral index of mindfulness as there was a significant positive association between BCT and meta-awareness, \( r = 0.42, p < 0.001 \), as well an inverse relationship with mind wandering, \( r = -0.38, p < 0.001 \), and no correlation with working memory, \( r = 0.04, p = 0.71 \). Exploration of criterion validity, suggested a positive association between accuracy of breath counting and trait mindfulness (i.e., Mindful Attention Awareness Scale; MAAS; Brown & Ryan, 2003), \( r = 0.20, p = 0.05 \), and (i.e., Five Facet Mindfulness Questionnaire; FFMQ; Baer et al., 2006), \( r = 0.21, p = 0.05 \). Furthermore, incremental validation was suggested by the finding that when controlling for MAAS and FFMQ, breath counting accuracy still significantly explained unique variance in meta-awareness (Levinson et al., 2014). Study two contributed the findings that breath counting accuracy was significantly associated with reduced negative mood (i.e., PANAS), \( rs = -0.17, p = 0.05 \), and supported 1-week test-retest reliability (ICC = 0.60) of breath counting (Levinson et al., 2014).

During the breath counting program, stimuli labeled distractors that have been paired with reward were used to provoke “wanting” behavior (i.e., attending to stimuli). The authors found increased breath counting accuracy was associated with decreased wanting such as stimulus dependent responding, \( r = -0.31, p = 0.05 \). Study three also found that long term meditators were better at breath counting accuracy than novice meditators when controlling for sustained attention, \( t(36) = 2.01, p = 0.05 \) (Levinson et al., 2014). Study four randomized
participants to three groups, which were the breath counting training, a working memory task requiring participants to remember spatial location of objects over time, and a no-training control. Measures were completed prior to training and post-training. The training was four weeks of daily breath counting training, working memory training, or four weeks of no training. The authors found a significant group by time interaction on the mindfulness measure (i.e., FFMQ), suggesting superior outcome for the breath counting training group in the cultivation of mindfulness. Additionally, these findings illuminate that the breath counting training over time significantly increased accurate breath counting, $F(1, 68) = 5.89, p = 0.02$. Another fascinating finding, shows those who improved most in accurate breath counting also increased most in mindfulness (i.e., FFMQ), $r = 0.44, p = 0.04$, suggesting the use of the breath counting program over time can train mindfulness (Levinson et al., 2014).

**Mindfulness and Self-compassion Connection**

Interestingly, in their series of studies examining breath counting training, Levinson et al. (2014) collected exploratory data on the Self-Compassion Scale (SCS) administered at pre and post the four-week breath counting training. The authors found no significant improvement in the working memory training or no training control groups, but did in the breath counting training group (Levinson et al., 2014). These data suggest the breath counting training may be a promising direct approach to promoting basic mindfulness skills that has an indirect effect of also fostering self-compassion. A direct comparison of the breath counting training and a self-compassion training may be a plausible future direction, to explore which training produces higher levels of self-compassion and mindfulness as both have been associated with enhanced well-being.
Mindfulness and Self-compassion

Mindfulness practices attempt to cultivate an awareness and non-judgmental embrace of our experiences (e.g., thoughts, feelings, or emotions) as they occur. Self-compassion adds another dimension by explicitly cultivating acceptance of the experiencer (Neff, 2012). Therefore, it might be beneficial to combine both mindfulness and the explicit training in self-compassion in the course of therapeutic treatment (Neff, 2012).

Albertson, Neff, and Dill-Shackleford, (2014) conducted a randomized controlled trial comparing an internet based self-compassion program (N = 98; M age = 38) to a waitlist control condition (N = 130; M age = 36), to assess whether a 3-week self-compassion meditation program could improve body satisfaction among multigenerational aged women struggling with body dissatisfaction. Every day for three weeks, participants were given a link to guided audio consisting of a 20-minute self-compassion meditation. Results suggest three weeks of contact with the self-compassion meditation improved body satisfaction and self-compassion while decreasing body shame and self-worth linked to appearance. These findings were maintained at three-month follow-up. Thus, using internet-based self-compassion training may be a cost effective way to overcome barriers of access to services that enhance body image satisfaction for women (Albertson et al., 2014).

The Efficacy of Self-compassion

MacBeth and Gumley (2012) conducted a systematic review and meta-analysis to assess the correlates between compassion and psychopathology symptoms with adult samples finding self-compassion to inversely correlate with depression and anxiety. This means as compassion increased, depression and anxiety decreased. It was noted, however, that what was measured was compassion, not specifically self-compassion (MacBeth & Gumley, 2012; Neff, 2003a,b).
Currently, there are no systematic reviews or meta-analyses examining the effects of self-compassion and youth, but a number of specific studies have examined self-compassion in adolescence.

Bluth and Blanton (2015) found that older adolescent females had lower self-compassion than their male peers and younger adolescents in a sample of ninety 11-18 year-old adolescents. A moderating effect was found when accounting for early or late adolescence, with older adolescents having more powerful association between higher self-compassion and lower negative emotions. Specifically, the higher their self-compassion, the lower their negative affect (Bluth & Blanton, 2015; Alberston, Neff, & Dill-Shackleford, 2014; Gilbert & Irons, 2005; Goetz et al., 2010; Neff & Dahm, 2015; Porges, 2007; Rockliff, Gilbert, McEwan, Lightman, & Glover, 2008).

Neff and Faso (2014) found in a correlational study, that parents of children with autism that were more self-compassionate had more life satisfaction, goal reengagement, hope, and less parental stress, and depression compared to parents with low self-compassion. They found that self-compassion predicted parental well-being even when accounting for the severity of children’s symptoms (Neff & Faso, 2014). Furthermore, self-compassion has been found to help one cope with negative experiences and trauma. Vettese, Dyer, Li, and Wekerle (2011) found that children who experienced trauma or maltreatment and their subsequent experience of emotion dysregulation was mediated by levels of self-compassion (Neff & Dahm, 2015). The more self-compassion one had the less likely they were to experience emotion dysregulation. If self-compassion can help those who experience trauma be less dysregulated it may be one that could help adolescents in general as they progress through a developmental period often marked by experiences of storm and stress.
Bluth, Gaylord, Campo, Mullarkey, and Hobbs (2016) conducted a mixed method cross-over pilot study exploring the effects of self-compassion with 34 adolescents. The pilot study evaluated a teen focused six-week adaptation of the adult version of the Mindful Self-Compassion Program. Findings showed that the treatment group had greater self-compassion than the waitlist control group. Bluth, Roberson, Gaylord, Faurit, Grewn, Arzon, and Girdler (2016) found that 28 adolescents (aged 13-18) with higher levels of self-compassion had higher levels of self-reported emotional well-being compared to adolescents with low levels of self-compassion. Bluth, Campo, Funtch, and Gaylord (2017) completed a cross-sectional survey with adolescents \( N = 765 \) in grades 7th to 12th grade. They found that self-compassion was associated with emotional well-being. Furthermore, adolescents with higher levels of depression had low or average levels of self-compassion, and older females had lower self-compassion than younger females, and all aged males.

Many of the psychological interventions with empirical support remain unaccessed by many due to the way interventions are administered. Psychological interventions are typically administered one-to-one, in-person, which remains a barrier to wide accessibility to the masses (Kazdin, 2011). Kazdin (2011) reported that computerized treatment produced better outcome than treatment as usual for anxiety and produce positive improvements for depression (Proudfoot et al., 2004). Glasgow (2008) advocates for the move away from research trials and interventions administered in ivory towers. To stay current and advance behavioral medicine, more trials in real world practical settings should occur. As technology advances, so to should the practice of psychology.

Boosting access to evidenced based psychological interventions requires a landscape supporting population based implementation abilities (Santucci, McHugh, & Barlow, 2012). In
addition to capabilities to provide interventions that are wide reaching, and self-administered in which consumers have direct access, with minimal contact required, social marketing is an important dynamic to publicize intervention availability (Santucci, McHugh, & Barlow, 2012). Technology continues to secure the use of computers and the internet as a viable landscape to access the masses. Titov (2011) reports that internet-based psychological interventions have preliminary supporting evidence. It is imperative that the call is answered to implement research on population based low intensive treatments to reach the masses.

**Statement of Purpose**

There is some support for the efficacy of mindfulness and self-compassion in adults. Preliminary findings support both mindfulness training and self-compassion training for well-being with youth in a group format but there still remains a paucity of experimental research on these interventions with youth (Bluth & Blanton, 2014; Bostic et al., 2015; Burke, 2009; Flook et al., 2015; Flook et al., 2010; Roeser & Eccles, 2015; Zenner et al., 2014; Tan, 2015, Zoogman et al., 2014; Zylowska et al., 2008). The efficacy of mindfulness interventions for reducing psychopathology and increasing mindfulness skills, and self-compassion with youth have been supported by several systematic reviews and met-analyses. However, there have been no studies to date that include the breath counting behavioral mindfulness measure of Levinson et al. (2014) with youth. The results with adults suggest explicit cultivation of self-compassion significantly increases trait self-compassion. Since literature suggests that self-compassion is a possible mechanism of action in mindfulness interventions and psychological well-being outcomes, more attention is warranted on the explicit cultivation of self-compassion and the distinct difference mindfulness and self-compassion trainings may yield. Adolescence is a complex developmental
phase in life and it is plausible to shift our investigative focus on the effects of mindfulness and self-compassion trainings on various outcomes with this group.

The current study sought to examine the efficacy among adolescents of two techniques that have empirical support for their use with adult populations: breath counting training (BCT; Levinson et al., 2014), and self-compassion training (SCT; Weng et al., 2013; Alberston, Neff, and Dill-Shackleford, 2014). Adolescents were recruited from an alternative high school to participate and were randomly assigned to one of four conditions: (1) BCT for four sessions, followed by four sessions of SCT, (2) SCT for four sessions, followed by four sessions of BCT, (3) BCT for eight sessions, or (4) SCT for eight sessions. Subjective ratings of current mindful awareness and self-compassion were taken at the conclusion of each 10-15 minute session. The Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer, & Smith, 2011) and the Self-Compassion Scale Short-Form (SCS; Raes, Pommier, Neff, and Gucht, 2011) were collected prior to participation, prior to each session, and at post-intervention. The Depression Anxiety and Stress Scale-21 (DASS; Lovibond & Lovibond, 1995) was collected at the beginning, middle, and conclusion of participation.

The following hypotheses were explored:

**Hypothesis One:** Self-Compassion Training will produce greater responses on the Self-Compassion Scale Short-Form compared to the Breath Training.

**Hypothesis Two:** Self-Compassion Training will produce greater responses on the Child Adolescent Mindfulness Measure compared to the Breath Training.

**Hypothesis Three:** There will be meaningful change on the Depression Anxiety Stress Scale-21 between A1 and A3 and between A3 and A4, with Self-Compassion Training producing greater responses compared to the Breath Training.
METHODOLOGY

Participants

Twenty participants ages 16-18 (M = 17.30, SD = .73) we recruited and provided consent/assent to participate in the study (see Table 1). Participants were students in grades 10-12 (M = 11.62, SD = .58), recruited through an alternative high school. The study sample self-reported as a diverse group of participants; 15% Euro-American, 60% African American, 10% Latinx, 15% Multi-Ethnic. Participants in the study were reported to be made up of 40% (n = 8) male, 55% (n = 11) female, and 5% (n = 1) gender neutral. Normative data for the MSSS community ladder showed a mean of 7.2 ±1.3 (Goodman et al., 2001). Average self-report of socioeconomic status as indicated on the MSSS for the current sample was 5.15 (SD = 1.63).

Upon caregiver report, 55% indicated a household income of $5,000 – 24,999, 30% reported an income of $25,000 – 74,999, 5% reported an income of more than $100,000, and 10% did not report their income. Forty percent (n = 8) of participants were reported to live in a single parent home and 10% (n = 2) were reported to lived alone with no caregiver.

Table 1

Demographic and Impression Management Scores

<table>
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<tr>
<th>Participant #</th>
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<th>Age</th>
<th>Grade</th>
<th>Ethnicity</th>
<th>Live with 2 caregivers</th>
<th>Impression Management Score</th>
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<td>Grade</td>
<td>Ethnicity</td>
<td>Live with 2 caregivers</td>
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<th>Grade</th>
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<th>Impression Management Score</th>
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<td>Latino</td>
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</tbody>
</table>

*Note. The higher the Impression Management Score the more likely the responder is to provide false reports.*

**Sample Outcome**

Of the 20 participants recruited for the study, twenty completed all pre to post meetings (see Figure 1) and were considered part of the intent-to-treat sample.

**Inclusion Criteria**

Participants were age 14-18 years (inclusive), currently enrolled in an alternative Kalamazoo County High School. Participants had daily access to a networked computer in school or home Monday through Friday. Participants were included without regard to race, sex, socio-economic status, or ethnicity. All participants were provided assent and at least one of their legal guardians provided informed consent. Participants who participated spoke English. All adolescents who expressed interest and completed the assent/consent process met the inclusion criteria.
Figure 1. Flow diagram of participants.
Exclusion Criteria

Adolescents currently receiving counseling were ineligible as were those with a new or change dose of medication prescribed for psychiatric reasons within the last eight weeks of their potential participation. There were no adolescents that completed the consent/assent process who met the exclusion criteria.

Setting

The school setting was the venue for all assessments and trainings meetings. The meetings took place in private rooms.

Design

The current study utilized a hybrid group/single subject design: Participants were randomly assigned to one of four conditions. The first two conditions involve A/B phase change, and the other two were constant series controls. Specifically, the first condition consisted of Breath Counting Training (BCT) for two weeks (four meeting sessions), followed by two weeks (four meeting sessions) of Self-Compassion Training (SCT). The second condition consisted of SCT for two weeks, followed by two weeks of BCT. The third condition consisted of four weeks (eight meetings) of BCT. The fourth condition consisted of four weeks (eight meetings) of SCT. Across all conditions, during week five one assessment meeting occurred. There was also a one-month follow-up assessment meeting during week nine. Repeated measures of mindfulness (i.e., the CAMM) and self-compassion (i.e., SCS-SF) were administered prior to each meeting and at the follow-up meeting across all conditions.
Procedure

Subject Recruitment

School personnel (teachers, counselors, and administrators) were made aware of the study via meetings with the researchers, announcements during staff and faculty meetings, and a flier introducing the study. School staff and researchers announced during class the option to participate in this study via script created by the primary researcher. The researcher also spoke with students during class and lunch time to provide information about the study. The information provided was based on a script. If after hearing the study description from the script, there was continued interest in potentially participating, school staff provided interested parties with researchers contact information such as email, phone number, or room number if during the hour’s researcher was present in school. The researcher had set hours in which he/she were in a private room in the high school. If the researcher was contacted and interest was expressed the consent process was initiated.

Researchrandomizer.org was used to determine at random a number 1-4 to correspond with each of the 4 treatments. Next 10 sets of 4 numbers (1-4) in random order were determined, each representing one of the treatments. Thus, the order of treatment delivery was randomized over blocks of 4. Researchrandomizer.org was also used to generate a randomized list of 40 numbers, which began the randomly selected participant number assigned to each participant.

Informed Consent Process

The first step in the consent process was sending the consent document home to be read and signed by a parent/legal guardian. The last page of the consent document asked the parent/legal guardian to (a) initial having read the document, (b) decide if he/she would like to meet face-to-face or via phone with a researcher prior to consenting or, if not, to decline
participation or indicate agreement to participation, and (c) to sign and date. When the researcher received the signed document, he/she took the next step based on the wishes of the parent/legal guardian. If the parent/legal guardian declines, the process was terminated. If he/she wished to speak with a researcher, it was pursued based on the method of contact preferred by the parent/legal guardian.

Following the phone or in-person meeting, the parent/legal guardian completed a modified last page of the consent document where he/she initialed having read the document and having spoken to a researcher, (b) indicated a decision to decline participation or agree to participation, and (c) signed and dated. When the researcher received the signed document, he/she took the next step based on the wishes of the parent/legal guardian. (Throughout the process, any failure to return a signed consent document was considered declining the invitation to participate.) When the final page of the consent document was returned with the appropriate signature and indication of willingness to participate, the assent process begun. A researcher met with the teen to provide both a verbal and written explanation about the study. The information provided was in the assent document. The researcher elaborated on, summarized, or re-worded the material in assent document as necessary to ensure the teen understood and had his/her questions answered. As always, the assent document was clear in stating that participation was entirely voluntary and that withdrawal from the study could occur at any time. A flowchart of the consent process and the relevant choice points is provided in (Appendix A).

The consent process was designed to minimize any potential coercive influence. The parent/legal guardian was given easy options to decline participation by simply checking a line on the form or deciding not to return the consent document. As such, this procedure significantly reduced the potential for perceived coercion and eliminated any social discomfort that might
have arisen by having to decline face-to-face when seated with a researcher. The procedure also
maintained for parents/legal guardians a ready option to have direct contact with a researcher,
prior to consenting, if he/she so desired via the method of his/her choice (i.e., face-to-face or by
phone). Thus, this procedure maximized parental/legal guardian freedom of choice.

All assessments (one, two, three, and one-month post-training meeting) took place
before, during or after school hours while school personnel were still present, depending on
researcher and participant availability. Study staff worked with the school and the participant to
arrange the best schedule possible, so to minimize the disruption to the participant’s academic
schedule. To minimize impact on class attendance we worked with the school counselor staff,
who interface with the participant’s teachers, to determine the least disruptive times for students
to attend. Also, when possible students were seen before or after school, but this was not always
feasible due to transportation issues.

**Breath Counting Training Condition (BCT)**

**First Condition (BCT → SCT)**

Participants were taught to engage in focused counting of their breath from one to nine.
This was done for either 15 minutes during meeting one and eight minutes for the remaining
meetings. With breath one through eight, participants pressed the down arrow on the computer
keyboard and on the ninth breath they pressed the right arrow to end the count. This allowed
each set of nine breaths to be assessed for accuracy. During meeting one, guided mindfulness
pre-recorded audio instructions were read by David Levinson under the supervision of Richard
Davidson Ph.D. (Levinson et al., 2014). Feedback was provided at the end of each set, either a
wooden wind chime noise to point out an error was made in the breath count or no noise if the
breath count was accurate for the set. Below is an example of the first of the four conditions that participants were randomized to.

**Meeting One**

At the beginning of meeting one, participants completed in a paper pencil format the following assessments: demographic form, additional serves form, MEIM, MSSSS, IM-BIDR, CAMM, DASS-21, and the SCS-SF. This meeting lasted a total of 30-minutes. Once participants complete all assessments, BCT began. The participants were provided with instructions on how to use e-learning to participate in this study. Participants were provided with a username and password for e-learning. The instructions provided to participants covered topics such as completing the in-meeting practice (i.e., Breath Counting Training program) and daily homework practice (i.e., Breath Counting Training program). When instructional portion of meeting was completed, the researcher handed the participant headphones to begin training and allowed participants to sign into e-learning. When the participant signed into e-learning, the e-learning program automatically documented what time the participant logged in, and this is labeled a timestamp. Once the participant signed into e-learning, there was an option to click on a link that took participants to the 15-minute breath counting program main page (http://webtasks.keck.waisman.wisc.edu/breath/demo/).

Participants then clicked on the link labeled “I would like instructions”, after they completed the instructions their breath counting program immediately began. At the completion of the Breath Counting Training first meeting, participants were asked via e-learning two questions and given response options. The first question was, “Where was your attention during the activity?” and the responses was on a 6-point likert scale (1 = completely off-task, 6 = completely on-task) via e-learning. The second question was, “How much self-compassion did
you feel during the activity?” with response options on a 6-point likert scale (1 = least, 6 = most). When participants submitted their responses to the questions, the time stamp of completion was recorded via e-learning.

Both sign-in and question submission time stamps gave the researcher and approved research staff information on what time the participant signed on e-learning, and what time the participants answered the questions provided at the completion of the breath counting program.

**Homework**

Participants were asked to complete the 8-minute breath counting accuracy program, via e-learning, every day until the next meeting. The link to this 8-minute practice (http://webtasks.keck.waisman.wisc.edu/breath/8minslient/) was available through e-learning. Each day the timestamp would have been recorded when participants signed in to complete their 8-minute breath counting homework assignment, and a timestamp would have been recorded when the participant submitted their responses to the two-questions provided at the conclusion. However, participants did not complete their homework in this or any condition.

**Meetings Two Through Four**

Meetings two through four occurred during week one and two and lasted a total of 15-minutes. At the beginning of each meeting, participants completed the CAMM and SCS-SF assessments. After the completion of the two measures, the researcher handed the headphones to the participant and allow the participant to sign into e-learning via computer provided. Once in e-learning, the participants were provided a link to the home page of the 8-minute Breath Counting Training program (http://webtasks.keck.waisman.wisc.edu/breath/8minslient/). Once the participant clicked the link, the participant saw two options, 1) receive instructions if they don’t remember or 2) “I want to skip right to the 8-minute unguided training”. If participant clicked the
instruction link, they received instructions and at the completion of the instructions, they were guided directly to the 8-minute training. If they choose to skip the instructions, they immediately began the 8-minute training. At the completion of the breath counting practice first meeting, participants were asked via e-learning two-questions and given response options. The first question was, “Where was your attention during the activity?” and the responses will be on a 6-point likert scale (1 = completely off-task, 6 = completely on-task) via e-learning. The second question was, “How much self-compassion did you feel during the activity?” with response options on a 6-point likert scale (1= least, 6= most). When participants submitted their response to the question provided, the participant’s submission time stamp of completion was recorded via e-learning.

**Difference Between Meeting One and Two Through Four**

The difference between the 15-minute guided Breath Counting Training and the 8-minute un-guided Breath Counting Training was the 15-minute training provides instructions on how to relate to ones’ feelings, thoughts, and emotions that may arise while engaging in the Breath Counting Training program. The 8-minute unguided Breath Counting Training program does not provide these instructions. Both the 8-minute and 15-minute programs ask participants to count their breath with a 9-count, starting the count over at one when the participants reached nine. Both programs provided sounds of nature and birds chirping as the background. Both programs also provided pictures of moving tall grass and flowers while the programs are running.

**Homework for Meetings Two Through Four**

At the end of meetings two through four, participants received homework instructions (to complete 8-minute breath counting accuracy program via e-learning every day until the next meeting) after participant’s answered the two questions provided. Homework instructions were
to complete the 8-minute version of the Breath Counting Training program daily through e-learning until the next meeting through this 8-minute practice link (http://webtasks.keck.waisman.wisc.edu/breath/8minsilent/). Each day the timestamp would have been recorded when participants signed in to complete their 8-minute breath counting homework assignment, and a timestamp would have been recorded when the participants submitted their response to the two questions provided at the conclusion of their homework assignment. However, none of the participants did not complete any homework practice.

**Self-compassion Training Condition (SCT)**

This phase (B), consisted of audio guided instructions that were pre-recorded and could be accessed on the internet in e-learning. Each training script was written by an expert, the first is a 15-minute recording which was played during meeting five and consists of compassion training for a loved one and then the self. The second recording which was used for the remainder of the meetings was approximately 7 minutes and only included self-compassion. Participants were guided in the practice of compassion for a loved one by the audio. Participants were instructed to repeat, “May you be free from this suffering, May you have joy and happiness.” Participants were also instructed to imagine a golden light shining from their heart to the sufferer. Participants were further instructed to pay attention to their physiological responses during the meditation. This audio material was based on the loving kindness meditation (Salzberg, 1997) and created to cultivate compassion in beginner mediators. It was written by Linda Wuestenberg, M.Ed. She is a licensed social worker and has been practicing compassion meditation since 1993. The script was read by Helen Weng, Ph.D. under the supervision of David Richardson, Ph.D. (Weng et al., 2013).
Meeting Five

Meeting five was the beginning of the compassion training phase and lasted 30-minutes total. This meeting took place during week three. At the beginning of meeting five, participants completed the SFS-SF, the CAMM, and the DASS-21. Training meeting five began immediately after the completion of the three assessments and participants were instructed in how to access the compassion training via e-learning on the computer, provided headphones by the researcher, and began the active training (i.e., listened to the compassion audio lead training).

After receiving instructions, the participants logged on to e-learning with user name and password provided by the researcher during meeting one and clicked a link labeled “SCT” which started an audio recorded guided compassion training which is approximately 15-minutes in length. The compassion training included a guided meditation on loving kindness, compassion for a loved one and compassion for self (Weng et al., 2013).

At the end of the 15-minute guided compassion training, participants were provided two questions with response options for each question. The first question was, “Where was your attention during the activity?” and the responses was on a 6-point likert scale (1 = completely off-task, 6 = completely on-task) via e-learning. The second question was, “How much self-compassion did you feel during the activity?” with response options on a 6-point likert scale (1 = least, 6 = most). When participants submitted their responses to the questions, and the time stamp of completion was recorded via e-learning.

Homework

After the submission of the second question response, participants received homework instructions, which were to complete the 7 minute self-compassion audio guided training every day until the next meeting. However, no participants completed any homework practices.
Meetings Six Through Eight

Meetings six through eight occurred during week three and four and last 15-minutes. At the beginning of meetings six through eight, participants completed the SFS-SF and the CAMM measures. Once the two measures were completed, participants were given headphones and allowed to begin the 7-minute guided self-compassion training. At the completion of the 7-minute audio recording of compassion for self on e-learning, participants were provided with two questions and response options. The first question was, “Where was your attention during the activity?” and the responses was on a 6-point likert scale (1 = completely off-task, 6 = completely on-task) via e-learning. The second question was, “How much self-compassion did you feel during the activity?” with response options on a 6-point likert scale (1 = least, 6 = most). When participants submitted their responses to the questions, the time stamp of completion was recorded via e-learning.

Homework

After the response submission, participants received homework instructions, which were to complete the 7-minute self-compassion audio recording daily using link provided via e-learning until the next meeting. However, no participants completed any homework practice.

Assessment Meeting Three

One week after the last meeting (meeting eight), participants met with the researcher and completed assessment meeting three. The assessments completed during this meeting were the SCS-SF, the CAMM, and the DASS-21. The participants also were encouraged to continue using the e-learning links to practice BCT and SCT over the next month. However, no participants used e-learning over the next month.
Second Condition (SCT → BCT)

The condition was the reversal of the first condition. That is, 4 sessions of SCT followed by 4 sessions of BCT. The length, frequency, and content of meetings, as well as the assignment schedule, was identical to the BCT → SCT condition.

Third Condition (BCT)

The third condition was eight meetings of BCT with no provision of SCT. The first two weeks were the same as phase A of the first condition, and the second two weeks were four more meetings of BCT. The homework remained the same across the eight sessions. The assessment schedule was identical to the other conditions. No participants completed homework practice in this condition.

Fourth Condition (SCT)

The fourth condition was eight meetings of SCT with no provision of BCT. The first two weeks were the same as phase B of the first condition, and the second two weeks were four more meetings of SCT. The homework remained the same across sessions. The assessment schedule was identical to the other conditions. No participants completed homework practice in this condition.

One-month Follow-up Assessment Meeting (Assessment Meeting Four)

One month after assessment meeting three the follow-up assessment was completed. The assessments completed during this meeting were the SCS-SF, the CAMM, and the DASS-21. During this meeting participants were asked, to what extent have they used BCT and SCT (Appendix G). Participants also received a $20.00 visa gift card. Debriefing was included participants being provided with the rationale of the study, description of all conditions offered, and the link to the BCT program, and the link to the Compassion training. There was no time
limit placed on participant’s link access or opportunities to practice using links provided. For participants who were unable to attend face to face meeting, they were mailed the measures with a return pre-stamped envelope included. When the completed assessments were received, the researcher mailed the debriefing script unique to their condition and a $20.00 gift card to the participants.

**Participation Reinforcers**

After completion of the follow-up assessment meeting, participants were debriefed and received a $20.00 visa gift card for participating and provided with links go both the breath counting training and full compassion training to be used if interested. These programs are free of cost and provides open access, meaning anyone interested has access to use each program.

**Measures**

**Demographic Measure**

This measure was created by researchers in the Behavior and Research Therapy Lab. The demographic measure was designed to gather background information pertaining to age, grade, and family history. This form was administered during first assessment session.

**Multigroup Ethnic Identity Measure (MEIM; Phinney, 1992)**

The MEIM (Appendix B) is a 14-item measure designed to assess ethnic identity of adolescents. Cronbach’s alpha was is .81 (Phinney, 1992) with high school student and .85 for early adolescents who label themselves as monoracial or multiracial (Spencer, Icard, Harachi, Catalano, & Oxford, 2000). The MEIM assess three areas related to ethnic identity: affirmation and belonging, ethnic achievement, and ethnic behaviors. A sample item would state, “I am happy that I am a member of the group I belong.” High scores on a four point likert scale represent strong ethnic identity, ranging from 1 indicating strong disagreement to 4 indicating
strong agreement. This measure was administered during the first assessment session to detect participant’s ethnic identity and evaluate potential correlations between ethnicity and treatment outcome.

MacArther Scale of Subjective Social Status-Youth Version (MSSSS; Goodman et al., 2001)

The MSSSS (Appendix B) is a one-item measure designed to assess perceived socioeconomic status of adolescents and their families. Ratings were reported in a ten point format portrayed as participant’s placement on a social ladder. Rating intraclass correlation coefficient is .73 for society (Goodman et al., 2001). The higher placement on the ladder according to the adolescent’s perception, indicate their perceived higher socio-economic status in society. This assessment was administered during the first assessment session to capture socioeconomic status and evaluate potential correlations between socioeconomic status and treatment outcome.

Impression Management Subscale of the Balanced Inventory of Desirable Responding (IM-BIDR; Paulhus, 1991)

The IM-BIDR (Appendix C) is a 20-item measure of social desirable responding such as an explicit manipulation in reporting to influence how one is perceived by others (Miller & Ruggs, 2014). This 20-item subscale (i.e., 10-items indicating denial and 10-items indicating enhancement statements) is extracted from the 40-item BIDR version 6 measure which includes both the impression management dimension and the self-deception dimension (Miller & Ruggs, 2014). These two dimensions are distinct, with correlations ranging from .05 to .40 (Paulhus, 1984, 1988, 1991). The IM subscale has a good range of internal consistency (α = .75 to .86; Paulhus, 1988, 1991). The IM measure is largely one of the most used social desirable responding measures (Steenkamp, de Jong, & Baumgertner, 2010; Miller & Ruggs, 2014). The
test-retest correlations of the IM subscale were conducted across five weeks and were .69 and .65 (Paulhus, 1988, 1991). Common method variance (CMV) is controlled for using the IM subscale in anonymous settings and faking is controlled for using the IM subscale in confidential settings (Miller & Ruggs, 2014). One factor Internal consistency in both anonymous and confidential conditions was Cronbach’s alpha .78 (Miller & Ruggs, 2014). The denial factor 10-items found alpha to be .72 in the anonymous condition and .70 in the confidential condition. The enhancement factor 10-items found alpha to be .61 in the anonymous condition and .65 in the confidential condition (Miller & Ruggs, 2014). Internal consistency was found to be stable over a five-week period (Paulus, 1994). The greater the IM-BIDR score indicates greater levels of overt social desirability responding. The IM-BIDR was administered at assessment session one.

**Self-compassion Scale Short-form (SCS; Raes, Pommier, Neff, and Gucht, 2011)**

The SCS-SF (Appendix D) is a 12-item self-report measure abbreviated from its original 26-item format. SCS-SF measures self-reported Self-Compassion; in particular, the subscales were Self-Kindness, Self-Judgement, Common Humanity, Isolation, Mindfulness, and Over-identification with feelings. The short-form is strongly correlated with the SCS long-form version ($r \geq .97$, in all samples) and has good internal consistency (Cronbach’s alpha $\geq .86$, in all samples; Raes, Pommier, Neff, and Gucht, 2011). This measure has been used to measure self-reported self-compassion with adolescents (Bluth et al., 2015). The measure asked participants to document how the act towards themselves during difficult times. A sample item would be, “When I’m going through a very hard time, I give myself the caring and tenderness I need.” The responses are on a 5-point likert scale, were “1” indicated “almost never” and “5” indicated “almost always”. The higher the SCS-SF score the more self-compassionate the participant. The SCS-SF was administered at assessment sessions one, two, three, and one month follow-up. The
SCS-SF was also administered at the beginning of every treatment session, assessment session five, and at the one month follow-up assessment session.

**Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer, & Smith, 2011)**

The CAMM (Appendix E) is a ten-item abbreviated version of the 25-item CAMM, which assess mindfulness described as staying with thoughts and feelings in a non-evasive manner, while holding present moment awareness, with a nonjudgmental attitude (Greco, Baer, & Smith, 2011). The CAMM is a developmentally appropriate measure for school aged children and adolescents (Greco, Baer, & Smith, 2011). The CAMM has good internal consistency and has a Cronbach alpha of .81 (Greco, Baer, & Smith, 2011). This measure is positively associated with quality of life, academic competence, and social skills (Greco, Baer, & Smith, 2011). This measure is negatively associated with internalizing symptoms and externalizing behaviors (Greco, Baer, & Smith, 2011). The greater CAMM score indicated greater mindfulness in participants. Participants are asked how often each sentence is true on a 5-point likert scale with “0” indicating “never true” and “4” indicating “always true”. Here is a sample item from CAMM: “I get upset with myself for having feelings that don’t make sense.” The CAMM was administered at assessment sessions one, two, three, and one month follow-up. The CAMM was administered at the beginning of every treatment session, assessment session five, and at the one-month follow-up assessment session.

**Depression Anxiety Stress Scale-short version (DASS-21; Lovibond & Lovibond, 1995)**

The DASS-21 (Appendix F) is a 21-item self-report measure abbreviated from the 42-item long version measure. The DASS-21 is comprised of three scales: Depression, Anxiety, and Stress. The presences of these three dominations are assessed over the participants past week. Each scale contains seven items, with 3-point likert scale responses; “0” indicating “did not
apply to me at all” to “3” indicating “applied to me very much, or most of the time”. A sample of an item is, “I found it hard to wind down”. The DASS-21 adolescent sample internal consistency (Cronbach’s $\alpha = .80-.91$) is good (Lovibond & Lovibond, 1995; Tan & Martin, 2015). Factors of depression, anxiety, and stress are distinct, as well as the general distress factor according to confirmatory factor analysis with adults (Henry & Crawford, 2005; Tan & Martin, 2015). The DASS-21 total score measures general psychological distress or negative emotional symptoms. This measure has been used to measure psychological distress with adolescents (Tan & Martin, 2015). The higher the DASS-21 total score indicates more psychological distress. Patrick, Dyck, and Bramston (2010) were not able to find the three distinct dimensions depression, anxiety, and stress when exploring the latent structure of the DASS-21 using an adolescent sample, that was found in the adult sample; instead one general distress dimension was found. The three dimensions, depression, anxiety, and stress were undiscernible with an adolescent sample, and it is advised to use the one general distress dimension, which has been found (Patrick et al., 2010). The DASS-21 was administered at assessment session one, two, three, four, five, and the one-month follow-up assessment session.
RESULTS

Analytic Strategy

Sample-level and between-groups effects were analyzed using repeated measures ANOVAs and t tests. Pearson’s product moment correlations and partial correlations examined relationships between pre-intervention variables of interest and outcome. Session-by-session measures were analyzed using statistical procedures recommended for single case research, specifically Tau-U calculations (Parker, Vannest, Davis, & Sauber, 2011). For the constant series data (BCT:BCT and SCT:SCT) we examined whether there were statistically significant trends in the data, both at the single-participant level as well as when combining the data to yield a weighted (omnibus) effect. For the A/B phase change data, the analyses compared all data points between phase A and B. Nonoverlap is suggestive of a phase specific effect and the Tau-U analyses corrected for A phase trend. The A/B phase change data were also analyzed for each participant and the weighted averages across the samples also tested for statistical significance (Vannest, Parker, & Gonen, 2011).

Sample-level and Between Group Effects on the CAMM, SCS-SF, and DASS

To determine whether any potentially significant results might be readily attributed to demand characteristics, we first explored the relationship between post-intervention CAMM, SCS-SF, and DASS scores and the impression management measure, controlling for pre-treatment CAMM, SCS-SF, and DASS scores. Controlling for the relevant pre-treatment score, impression management scores did not significantly predict outcome on the CAMM (partial $r = .04, p = .88$), SCS-SF (partial $r = .18, p = .7$), or DASS (partial $r = -.38, p = .11$). Likewise, to determine if any potentially significant results might be readily attributed to differences in socioeconomic status, we next examined the relationship between post-intervention CAMM,
SCS-SF, and DASS scores and the MSSSS, controlling for pre-treatment CAMM, SCS-SF, and DASS scores. Controlling for the relevant pre-treatment score, MSSSS scores did not significantly predict outcome on the CAMM (partial $r = .22$, $p = .37$), SCS-SF (partial $r = .24$, $p = .33$), or DASS (partial $r = -.42$, $p = .07$).

All participants received eight sessions of intervention (BCT and/or SCT). As both BCT and SCT were active interventions, we first examined whether there were sample-level changes over the course of participation regardless of group assignment. Repeated measures ANOVAs tested the equality of the pre-intervention, mid-intervention and post-intervention means on the CAMM, SCS-SF, and DASS. The CAMM means ($M_{pre} = 20.10$ [SD = 10.33], $M_{mid} = 23.15$ [SD = 10.11], $M_{post} = 26.45$ [SD = 10.70]), suggested a statistically significant increase in mindfulness over time, $F(2,38) = 9.67$, $p < .001$. The overall SCS-SF means ($M_{pre} = 3.13$ [SD = 0.79], $M_{mid} = 3.38$ [SD = 0.84], $M_{post} = 3.55$ [SD = 0.94]), trended in the direction of increased self-compassion, $F(2,38) = 2.75$, $p = .10$, while the overall DASS means ($M_{pre} = 52.10$ [SD = 27.97], $M_{mid} = 46.10$ [SD = 27.02], $M_{post} = 44.20$ [SD = 32.29]), failed to demonstrate significant changes over time, $F(2,38) = 1.01$, $p = .38$. Participation, independent of group assignment, was associated with increases in self-reported mindfulness and a trend toward increased self-compassion, but commensurate changes in depression, anxiety, and stress were not observed.

For half of the participants ($n = 10$) the intervention started with four sessions of BCT (i.e., those in the BCT/SCT group and those in the BCT constant series group), while for the other half ($n = 10$) the intervention began with four sessions of SCT (i.e., those in the SCT/BCT group and those in the SCT constant series group). Thus, the pre- to mid-intervention data represent a small-scale randomized controlled trial allowing for comparison of four sessions of BCT with 4 sessions of SCT. Two group (BCT v. SCT) by two time point (pre and mid) repeated
measures ANOVAs examined whether there were any group x time interactions on the CAMM, SCS-SF, and DASS. The BCT ($M_{pre} = 20.20 \ [SD = 9.00], M_{mid} = 21.80 \ [SD = 9.80]$) and SCT ($M_{pre} = 20.00 \ [SD = 12.01], M_{mid} = 24.50 \ [SD = 10.75]$) means on the CAMM did not show a significant group x time interaction, $F(1,18) = 1.00, p = .33$. Similarly, the SCS-SF means in BCT ($M_{pre} = 3.07 \ [SD = 0.82], M_{mid} = 3.51 \ [SD = 0.67]$) and SCT ($M_{pre} = 3.20 \ [SD = 0.80], M_{mid} = 3.25 \ [SD = 1.00]$) also did not show a significant group x time interaction, $F(1,18) = 1.07, p = .32$. Finally, the DASS means in BCT ($M_{pre} = 49.40 \ [SD = 21.73], M_{mid} = 47.80 \ [SD = 34.11]$) and SCT ($M_{pre} = 54.80 \ [SD = 34.11], M_{mid} = 44.40 \ [SD = 33.47]$) also did not show a significant group x time interaction, $F(1,18) = 0.69, p = .42$. Thus, the small-scale RCT data do not suggest differential efficacy between four sessions of BCT or SCT on mindfulness, self-compassion, or distress.

**Group-level Effects on Weekly Pre-session CAMM and SCS-SF Scores**

The condition by gender/sex cross-tabulation indicates that the proportion of females in the BCT/SCT condition is 40% (2/5) and male is 60% (3/5). The proportion of females in the SCT/BCT condition is 60% (3/5) and male is 40% (2/5). The proportion of females in the SCT condition is 40% (2/5) gender neutral is 20% (1/5), and male is 40% (2/5). The proportion of females in the BCT condition is 80% (4/5), and male is 20% (1/5).

Analysis of covariance (ANCOVA) was conducted to assess whether gender/sex predicts post CAMM and SCS with pre as covariate. This analysis excluded the one gender neutral participant because of limited quantity of sample data. There was not a significant difference in sex on the CAMM, $F(1, 16) = .001, p = .971$. Similarly, there was not a significant difference in sex on the SCS, $F(1, 16) = .271, p = .610$. 

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Because BCT and SCT were constant series, the weighted Tau-U analyses tested for a significant trend in the data across the entire group (i.e., BCT or SCT). The weighted average trend for the five participants constituting the BCT constant series was statistically significant for the CAMM ($\tau = 0.67$, $Z = 5.64$, $p = .00$) and the SCS ($\tau = 0.49$, $Z = 4.15$, $p = .00$) but not for the DASS ($\tau = 0.44$, $Z = 1.88$, $p = .06$). The results were similar for the five participants constituting the SCT constant series where a statistically significant weighted group trend was found on both the CAMM ($\tau = 0.26$, $Z = 2.19$, $p = .03$) and the SCS ($\tau = 0.24$, $Z = 2.05$, $p = .04$) but not for the DASS ($\tau = 0.19$, $Z = 0.81$, $p = .41$). These data suggest positive group-level changes in self-reported mindfulness and self-compassion across time in both constant series conditions: BCT and SCT. These data also suggest both constant servies failed to experience a positive group level change (significant decreases) in self-reported psychological distress (see bottom right panel in Figures 2 through 7).
Figure 2. BCT constant series individual and group average CAMM scores.
Figure 3. BCT constant series individual and group average SCF-SF scores.
Figure 4. BCT constant series individual and group average DASS-21 scores.
Figure 5. SCT constant series individual and group average CAMM scores.
Figure 6. SCT constant series individual and group average SCS-SF scores.
BCT/SCT and SCT/BCT participants experienced a phase change. Thus, the weighted Tau-U analyses here examined the averaged effect of the relevant B phase (i.e., SCT or BCT) corrected for the trend during the relevant A phase (i.e., BCT or SCT). Examination of the weighted effect for the group receiving the SCT/BCT phase change failed to demonstrate a significant baseline corrected effect of the phase change on the CAMM ($\tau = 0.1$, $Z = 0.55$, $p = .58$) or the SCS ($\tau = 0.08$, $Z = 0.44$, $p = .66$). Likewise, the group receiving BCT followed by SCT, failed to demonstrate a significant baseline corrected effect of the phase change on the
CAMM ($\tau = 0.32, Z = 1.75, p = .07$) or the SCS ($\tau = 0.23, Z = 1.26, p = .21$). These data suggest BCT after SCT and SCT after BCT failed to produce incremental changes in group-level self-reported mindfulness or self-compassion (see bottom right panel in Figures 8 through 13).

The TAU-U analysis requires at least three time-points of the DASS scores in each phase to establish reasonable baseline to compare B phase to A phase to effectively examine group-level incremental changes of self-reported psychological distress. Therefore, statistical TAU-U analysis was unavailable for the DASS, but the graphs are listed below (see Figures 10 and 13).

Figure 8. BCT/SCT individual and group average CAMM scores across phases.
Figure 9. BCT/SCT individual and group average SCS-SF score across phases.
Figure 10. BCT/SCT individual and group average DASS-21 score across phases.
Figure 11. SCT/BCT individual and group average CAMM scores across phases.
Figure 12. SCT/BCT individual and group average SCS-SF scores across phases.
In sum, these within-group results are consistent with the sample-level and between-group effects reported above in suggesting that significant improvements in mindfulness and self-compassion were reported over time, but with no suggestion of differential or treatment specific effects of SCT or BCT.
Individual-level Effects on Weekly Pre-session CAMM and SCS-SF Scores

BCT

Because BCT was a constant series, the individual level Tau-U analyses, like the weighted results described above, tested for a significant trend, but here the test for significance was for each individual data series. The Tau-U analyses suggested that 5 out of 5 participants demonstrated a statistically significant trend in their scores on the CAMM and 2/5 produced statistically significant trends on the SCS.

The individual data series show the individual differences in response. P4 showed gradual session-by-session increases in mindfulness and self-compassion that resulted in a statistically significant positive trend on both the CAMM ($\text{Tau} = 0.94$, $Z = 3.54$, $p = 0.00$) and the SCS ($\text{Tau} = 0.88$, $Z = 3.33$, $p = 0.00$) and, accumulated, represented a large change. The data from P9 also revealed a significantly positive trend on both the CAMM ($\text{Tau} = 0.80$, $Z = 3.02$, $p = 0.00$) and the SCS ($\text{Tau} = 0.77$, $Z = 2.91$, $p = 0.00$), but show that P9 started at a relatively high level of self-reported mindfulness and self-compassion. P14’s CAMM data suggested a significant positive trend on the CAMM ($\text{Tau} = 0.52$, $Z = 1.98$, $p = 0.04$); however, it is clear that while there were some graduate increases in mindfulness, P14’s CAMM score started and ended at a relatively low level. Furthermore, the SCS data also started and remained at a relatively low level throughout, failing to produce a significant positive trend on the SCS ($\text{Tau} = 0.05$, $Z = 1.20$, $p = 0.83$). P31 demonstrated a significant positive trend on the CAMM ($\text{Tau} = 0.56$, $Z = 2.09$, $p = 0.04$) yet failed to produce a significant positive trend on the SCS ($\text{Tau} = 0.44$, $Z = 1.66$, $p = 0.09$). P36 also had a significant positive trend on the CAMM ($\text{Tau} = 0.52$, $Z = 1.98$, $p = 0.04$) but not the SCS ($\text{Tau} = 0.30$, $Z = 1.14$, $p = 0.25$). The data from P31 and P36 (and to a lesser extent P14) are interesting in suggesting a treatment specific effect for BCT; that
is, an effect on mindfulness but not self-compassion. Furthermore, visual examination of the time series data for all BCT participants suggest the benefit of eight sessions of BCT over four, as CAMM scores continued to markedly improve and/or stabilize over the last four sessions.

**SCT**

SCT was also a constant series, such that the individual level Tau-U analyses, like the weighted results described above, tested for a significant trend, but in this case for each individual data series. The Tau-U analyses suggested 1/5 experienced a statistically significant positive trend on the CAMM, and 2/5 on the SCS.

P5 failed to show a significantly positive trend on either the CAMM ($TAU = 0.03$, $Z = 0.10$, $p = 0.92$) or the SCS ($TAU = 0.08$, $Z = 0.31$, $p = 0.75$), generally reporting moderately high levels of mindfulness and self-compassion throughout. P16 also failed to demonstrate a significantly positive trend on either the CAMM ($TAU = -0.25$, $Z = -0.94$, $p = 0.35$) or the SCS ($TAU = -0.36$, $Z = -1.35$, $p = 0.17$) generally showing relatively low levels of mindfulness and moderate levels of self-compassion. Similarly, P34 showed consistently low levels of mindfulness and self-compassion, failing to produce a significant trend on either the CAMM ($TAU = 0.36$, $Z = 1.35$, $p = 0.17$) or the SCS ($TAU = -0.08$, $Z = -0.31$, $p = 0.75$). P25, on the other hand, showed graduate incremental changes in mindfulness and self-compassion over the course of SCT resulting in significant positive trends on both the CAMM ($TAU = 0.78$, $Z = 2.92$, $p = 0.00$) and the SCS ($TAU = 0.78$, $Z = 2.92$, $p = 0.00$) and overall represented a large change. The data from P24 are unique in suggesting a treatment specific effect for SCT on self-compassion. That is, P24 failed to evince a significant positive trend on the CAMM ($TAU = 0.39$, $Z = 1.46$, $p = 0.14$), but did on the SCS ($TAU = 0.80$, $Z = 3.02$, $p = 0.00$). The SCS data suggested consistent gradual enhancement of self-compassion over the entire course of SCT, while mindfulness
scores initially increased, but then gradually decreased, before appearing to rebound at the conclusion of SCT.

In summary, eight sessions of BCT produced statistically significant positive trends on the CAMM for 5/5, while eight sessions of SCT yielded significant CAMM trends for only 1/5; thus, suggesting more robust effects for BCT compared to SCT in enhancing mindfulness. Both eight sessions of BCT and SCT resulted in 2/5 showing significant positive trends on the SCS, suggesting equivalent and less robust results on self-compassion.

**BCT/SCT**

As BCT/SCT participants experienced a phase change, the Tau-U analyses here examined the effect of four sessions of SCT corrected for the trend during four sessions of BCT. These Tau-U analyses suggested 1 out of 5 participants had significant results on the CAMM and 0 out of 5 on the SCS.

P2 did not show a significant baseline corrected effect of the phase change on either the CAMM ($\textit{TAU} = 0, Z = 0, p = 1$), which remained consistently low throughout, or the SCS ($\textit{TAU} = 0.15, Z = 0.36, p = 0.71$), which was at a moderate level throughout. Participant P6 also failed to demonstrate a significant baseline corrected effect of the phase change on either the CAMM ($\textit{TAU} = -0.1, Z = -0.24, p = 0.8$) or the SCS ($\textit{TAU} = 0.2, Z = 0.48, p = 0.62$), both of which remained at a moderate level over the course of participation. Participant P17’s CAMM data produced a significant baseline corrected effect of the phase change ($\textit{TAU} = 0.9, Z = 2.20, p = 0.02$) showing a stable change in the level of mindfulness with the implementation of SCT. The SCS data failed to reach significance ($\textit{TAU} = 0.45, Z = 1.1, p = 0.27$), but it is worth noting that three of the four SCS data points taken during SCT were higher than any during BCT. Participant P27 failed to show significant effects of the phase change on either the CAMM ($\textit{TAU} = 0.2, Z = 0.48, p =$
0.62) or the SCS ($TAU = 0.5, Z = 1.22, p = 0.22$), both of which remained relatively low throughout. Finally, P33 also did not have significant baseline corrected effects on either the CAMM ($TAU = 0.4, Z = 0.97, p = 0.32$), which was in the moderate-high range throughout, or the SCS ($TAU = 0.15, Z = 0.36, p = 0.71$), which was stable and in the middle-range of the scale.

**SCT/BCT**

SCT/BCT participants also experienced a phase change such that the Tau-U analyses examined the effect of BCT corrected for the trend during SCT. These Tau-U analyses suggested 0/5 participants demonstrated a significant baseline corrected positive effect of the phase change on either the CAMM or the SCS.

Participant P10 showed generally low mindfulness scores over the course of participation failing to produce a significant effect of the phase change on the CAMM ($TAU = -0.1, Z = -0.24, p = 0.8$). On the SCS, P10 reported a small but consistent worsening of self-compassion during BCT resulting in a significant baseline corrected effect of the phase change ($TAU = -0.9, Z = -2.2, p = 0.02$). Participant P20 did not have significant baseline corrected effects of the phase change on either the CAMM ($TAU = 0, Z = 0, p = 1$) or SCS ($TAU = 0.25, Z = 0.61, p = 0.54$) showing low-middle range scores. Participant P37 also failed to show significant baseline corrected effects of the phase change with consistently moderate scores on the CAMM ($TAU = 0.2, Z = 0.48, p = 0.62$) and consistently high scores on the SCS ($TAU = 0.5, Z = 1.22, p = 0.22$). P38 reported relatively high mindfulness and self-compassion throughout failing to produce a significant baseline corrected effect of the phase change on either the CAMM ($TAU = 0, Z = 0, p = 1$) or SCS ($TAU = 0.2, Z = 0.48, p = 0.62$). Finally, P40 showed an initial rise in mindfulness on the CAMM during SCT that was maintained but not significantly improved during BCT ($TAU$
= 0.4, Z = 0.97, p = 0.39) and stable levels of self-compassion on the SCS that did not vary by phase (TAU = 0.35, Z = 0.85, p = 0.39).

In summary, there was no consistent evidence that four sessions of SCT or BCT, following four sessions of the other, produced significant incremental effects.

Sample-level and Between Group Effects on Post-session Mindfulness and Self-compassion

Immediately following a BCT or SCT training session, participants were asked to rate 1) “Where was your attention during the activity?” and 2) “How much self-compassion did you feel during the activity during the activity?” on a 1-6 Likert scale. To determine whether any potentially significant results might be readily attributed to demand characteristics, we first explored the relationship between post-session mindfulness and self-compassion and the impression management measure. Impression management scores did not significantly predict average post-session mindfulness (r = .19, p = .43) or self-compassion (r = .09, p = .71).

Likewise, to determine if any potentially significant results might be readily attributed to differences in socioeconomic status, we next examined the relationship between post-session mindfulness and self-compassion and the MSSSSS. MSSSS scores did not significantly predict average post-session mindfulness (r = -.27, p = .25) or self-compassion (r = -.14, p = .55).

Finally, post-session average reports of felt experience of mindfulness and self-compassion were not significantly correlated (r = .37, p = .11).

For half of the participants (n = 10) the intervention started with four sessions of BCT (i.e., those in the BCT/SCT group and those in the BCT constant series group), while for the other half (n = 10) the intervention began with four sessions of SCT (i.e., those in the SCT/BCT group and those in the SCT constant series group). Thus, the pre- to mid-intervention data represent a small-scale randomized controlled trial allowing for comparison of four sessions of
BCT with 4 sessions of SCT. Two \( t \) tests examined whether there were any group differences (BCT vs. SCT) in average post-session mindfulness and self-compassion ratings. The BCT (\( M = 4.25 \) [\( SD = 0.83 \)] and SCT (\( M = 4.48 \) [\( SD = 0.86 \)] mindfulness means were not significantly different, \( t(18) = 0.60, p = .56 \). Similarly, the BCT (\( M = 4.35 \) [\( SD = 0.79 \)] and SCT (\( M = 4.23 \) [\( SD = 1.02 \)] self-compassion means were not significantly different, \( t(18) = 0.31, p = .76 \).

**Group-level Effects on Post-session Mindfulness and Self-compassion**

Because BCT and SCT were constant series, the weighted Tau-U analyses tested for a significant trend in the data across the entire group (i.e., BCT or SCT).

The weighted trend for the five participants constituting the BCT constant series was not statistically significant on the mindfulness item (\( Tau = -0.04, Z = -0.33, p = .74 \)) nor the self-compassion item (\( Tau = 0.06, Z = 0.49, p = .62 \)). These data suggest that there were no significant group-level trends in mindfulness or self-compassion over the course of BCT. The mean scores for all 5 participants, averaged across all time points, were 4.55 (0.61) and 4.90 (0.91) on the mindfulness and self-compassion items, respectively, suggesting a moderate felt state of mindfulness and self-compassion at the conclusion of each session.

The weighted trend for the five participants constituting the SCT constant series was also not statistically significant on the mindfulness item (\( Tau = 0.03, Z = 0.22, p = .82 \)), but was statistically significant on the self-compassion item (\( Tau = 0.35, Z = 2.71, p = .00 \)). These data suggest a positive group-level trend in self-compassion during the SCT training interval. The mean mindfulness score for all five participants, averaged across all time points, was 4.60 (0.61) suggesting a considerable felt state of mindfulness at the conclusion of each session. On the self-compassion item the mean across the first half of SCT was 3.90 (0.74), an average that was slightly above the mid-point on the 1-6 scale, increasing to 4.50 (0.50) during the second half of
SCT, a score falling on the upper portion of the scale and suggesting a moderate felt state of self-compassion at the end of these sessions.

SCT/BCT and BCT/SCT participants experienced a phase change. Thus, the weighted Tau-U analyses here examined the averaged effect of the relevant B phase (i.e., SCT or BCT) corrected for the trend during the relevant A phase (i.e., BCT or SCT). Examination of the weighted effect for the group receiving the SCT/BCT phase change failed to demonstrate a significant baseline corrected effect of the phase change on the mindfulness item \( (\text{Tau} = 0.25, Z = 1.28, p = .20) \) or the self-compassion item \( (\text{Tau} = -0.09, Z = -0.46, p = .65) \). These data suggest BCT after SCT failed to produce incremental changes in post-session group-level self-reported mindfulness or self-compassion. The mean scores for all 5 participants, averaged across all time points, were 4.75 (0.66) and 4.70 (0.72) on the mindfulness and self-compassion items, respectively, suggesting a moderate felt state of mindfulness and self-compassion at the conclusion of each session.

The five participants receiving the BCT/SCT phase change demonstrated a statistically significant baseline corrected effect of the phase change on both the mindfulness item \( (\text{Tau} = 0.51, Z = 2.65, p = .00) \) and the self-compassion item \( (\text{Tau} = 0.7, Z = 3.61, p = .00) \). These data suggest SCT after BCT produced positive incremental group-level changes in both mindfulness and self-compassion. On the mindfulness item the mean across the BCT phase was 3.90 (0.68), an average that was slightly above the mid-point on the 1-6 scale, increasing to 4.65 (0.72) during SCT, a score falling on the upper portion of the scale and suggesting a moderate felt state of mindfulness at the end of these sessions. Likewise, on the self-compassion item the mean across the BCT phase was 3.85 (0.29), an average that was slightly above the mid-point on the 1-
6 scale, increasing to 4.65 (0.60) during SCT, a score falling on the upper portion of the scale and suggesting a moderate felt state of self-compassion at the end of these sessions.

**Individual-level Effects on Post-session Reports of Mindfulness and Self-compassion**

**BCT**

Examination of the five participants constituting the BCT constant series illuminated that 1/5 reported a statistically significant response on the post-session mindfulness item, while 0/5 had a statistically significant response on the self-compassion item. P4 failed to demonstrate a positive trend on either the mindfulness item ($TAU = -0.17$, $Z = -0.61$, $p = 0.53$) or the self-compassion item ($TAU = 0.03$, $Z = 0.12$, $p = 0.9$). P9 also did not show a significant positive trend on either post-session mindfulness ($TAU = -0.35$, $Z = -1.23$, $p = 0.21$) or self-compassion item ($TAU = 0$, $Z = 0$, $p = 1$). Likewise, P14 failed to show a statistically significant positive trend on either the mindfulness item ($TAU = -0.10$, $Z = -0.37$, $p = 0.71$) or self-compassion item ($TAU = 0.17$, $Z = 0.61$, $p = 0.53$). P31 similarly failed to demonstrate a positive trend in the post-session mindfulness item ($TAU = -0.32$, $Z = -1.11$, $p = 0.26$) or self-compassion item ($TAU = -0.25$, $Z = -0.86$, $p = 0.38$). P36, however, did show a statistically significant positive trend on post-session ratings of mindfulness ($TAU = 0.75$, $Z = 2.59$, $p = 0.00$) but not self-compassion ($TAU = 0.35$, $Z = 1.23$, $p = 0.21$).

**SCT**

In the SCT constant series, 0/5 had statistically significant effects on the mindfulness item, while 2 out of 5 reported a statistically significant positive trend on post-session self-compassion item. P5 failed to produce a positive trend on either the mindfulness item ($TAU = 0.21$, $Z = 0.74$, $p = 0.45$) or the self-compassion item ($TAU = 0.42$, $Z = 1.48$, $p = 0.13$). P16 too failed to show a statistically significant positive trend on either the mindfulness item ($TAU = -
0.32, \( Z = -1.11, p = 0.26 \)) or the self-compassion item \( (TAU = -0.01, Z = -0.37, p = 0.71) \). P24 produced a statistically significant positive trend on the post-session self-compassion item \( (TAU = 0.80, Z = 3.02, p = 0.00) \) but failed to produce a positive trend on the mindfulness item \( (TAU = 0.39, Z = 1.46, p = 0.14) \). P25 produced a statistically significant positive trend on the post-session self-compassion item \( (TAU = 0.75, Z = 2.59, p = 0.00) \) but failed to produce a positive trend on the mindfulness item \( (TAU = -0.46, Z = -1.6, p = 0.1) \). Finally, P34 failed to produce a positive trend on either the mindfulness item \( (TAU = 0.39, Z = 1.36, p = 0.17) \) or the self-compassion item \( (TAU = -0.03, Z = -0.12, p = 0.9) \).

**SCT/BCT**

As SCT/BCT participants experienced a phase change, the Tau-U analyses here examined the effect of four sessions of BCT corrected for the trend during four sessions of SCT. These Tau-U analyses suggested 0 out of 5 participants had significant results on the post-session mindfulness item and 0 out of 5 on the self-compassion item. Participant P10 failed to produce a significant baseline corrected effect of the phase change on either the post-session mindfulness item \( (TAU = -0.3, Z = -0.73, p = 0.46) \) or self-compassion item \( (TAU = -0.3, Z = -0.73, p = 0.46) \). P20 also failed to produce a significant baseline corrected effect of the phase change on either the mindfulness item \( (TAU = 0.25, Z = -0.57, p = 0.56) \) or the self-compassion item \( (TAU = 0.12, Z = 0.28, p = 0.77) \). P37 too failed to produce a significant baseline corrected effect of the phase change on either the self-reported mindfulness item \( (TAU = 0.18, Z = 0.43, p = 0.66) \) or self-compassion item \( (TAU = -0.62, Z = -1.44, p = 0.14) \). Likewise, P38 did not show a significant baseline corrected effect of the phase change on either the mindfulness item \( (TAU = 0.81, Z = 1.87, p = 0.06) \) or self-compassion item \( (TAU = 0.75, Z = 1.73, p = 0.08) \). Finally, P40 similarly did not evince a significant baseline corrected effect of the phase change on either the
mindfulness item \((TAU = 0.31, Z = 0.72, p = 0.47)\) or self-compassion item \((TAU = -0.37, Z = -0.86, p = 0.3)\).

**BCT/SCT**

BCT/SCT participants also experienced a phase change with Tau-U analyses examining the effect of four sessions of SCT corrected for the trend during four sessions of BCT. These Tau-U analyses suggested 1 out of 5 participants had significant results on the post-session mindfulness item and 2 out of 5 on the self-compassion item.

P2 produced a significant baseline corrected phase change effect on both the post-session mindfulness attention item \((TAU = 0.93, Z = 2.16, p = 0.00)\) and self-compassion item \((TAU = 1.18, Z = 2.74, p = 0.00)\). P6, however, failed to produce a significant baseline corrected effect of the phase change on either mindfulness \((TAU = 0.68, Z = 1.58, p = 0.11)\) or self-compassion \((TAU = 0.81, Z = 1.87, p = 0.06)\). P17 also failed to report a significant baseline corrected effect of the phase change on either the mindfulness item \((TAU = 0.5, Z = 1.15, p = 0.24)\) or self-compassion item \((TAU = -0.68, Z = 1.58, p = 0.11)\). P27 did not show a significant baseline corrected effect of the phase change on the mindfulness item \((TAU = 0.5, Z = 1.29, p = 0.19)\), but did on the post-session self-compassion item \((TAU = 0.93, Z = 2.16, p = 0.03)\). Finally, P33 failed to show a significant baseline corrected effect of the phase change on either the mindfulness item \((TAU = -0.12, Z = -0.28, p = 0.77)\) or self-compassion item \((TAU = -0.12, Z = -0.28, p = 0.77)\).

**Reported Use/practice of BCT and/or SCT Post-treatment to 30-day Follow-up Meeting**

Participants were asked at the 30-day follow up session how often they used or practiced breath counting training and/or self-compassion training since the last meeting. The overall results of all participant mean of reported practicing BCT was 13.2 days between post-treatment
and the 30-day follow-up meeting. The overall results of all participants mean of practicing SCT was 11.9 days between post-treatment and the 30-day follow-up meeting.

The BCT involved five participants and yielded a group mean of 12.66 days of reported practicing BCT over the 30-day follow-up time period, and a group mean of 11.25 days of practicing SCT over the 30-day follow-up time period. The SCT involved five participants and yielded a group mean of 7.5 days of reported practicing BCT over the 30-day follow-up time period, and a group mean of 12 days of reported practicing SCT over the 30-day follow-up time period. The BCT/SCT group involved five participants and yielded a group mean of 12.8 days of reported practicing BCT over the 30-day follow-up time period, and a group mean of 6.8 days of reported practicing SCT over the 30-day follow-up time period. The SCT/BCT group involved five participants and yielded a group mean of 19.75 days of reported practicing BCT over the 30-day follow-up time period, and a group mean of 17.5 days of reported practicing SCT over the 30-day follow-up time period. Although participants report using practicing both BCT and SCT, across all conditions, there were no participants that logged onto e-learning to participate in formal practice.
DISCUSSION

The purpose of the current study was to examine the efficacy among adolescents of two techniques with empirical support for their use with adult populations: breath counting training (BCT; Levinson et al., 2014), and self-compassion training (SCT; Weng et al., 2013; Alberston, Neff, and Dill-Shackleford, 2014). The study aimed to examine the effects of breath counting training and self-compassion training with adolescents using a computerized approach. The program was developed based on our review of mindfulness and self-compassion trainings both person led and computerized (Levinson et al., 2014; Weng et al., 2013; Alberston et al., 2014; Tan & Martin, 2015; Baer, 2003; Bishop et al., 2004; Kabat-Zinn, 1994; Segal, Williams, & Teasdale, 2002; MacBeth & Gumley, 2012; Neff, 2003b; Vettese, Dyer, Li, and Wekerle, 2011). The content of each training (BCT and SCT) were heavily influenced by the Breath Counting Training (Levinson et al., 2014) and Compassion Training (Weng et al., 2013) which was created in attempt to foster new ways to implement mindfulness and compassion training.

There is preliminary evidence that support that computerized breath counting training decreases mind wandering and increases mindfulness, self-compassion and attention in adults (Levinson et al., 2014). There is also preliminary evidence that computerized compassion training increases ultraistic behaviors (Weng et al., 2013) and audio-led self-compassion training increasing self-compassion in adults (Alberston et al., 2014). Previous findings also suggest that when self-compassion increases psychological distress measured by the DASS-21 in an adolescent sample decreases (Tan and Martin, 2015). To date, we have not found studies using a computerized approach to training mindfulness and self-compassion with adolescents.

In this study, participants were randomized into one of four conditions. The four conditions of the study comprised of either eight sessions of BCT, eight sessions of SCT, four
sessions of SCT followed by four sessions of BCT, or four sessions of BCT followed by four
sessions of SCT. The first two conditions involve A/B phase change, and the other two were
constant series controls. Specifically, the first condition consisted of computerized Breath
Counting Training (BCT) for 2 weeks (four meeting sessions), followed by 2 weeks (four
meeting sessions) of computerized Self-Compassion Training (SCT). The second condition
consisted of computerized SCT for 2 weeks (four meetings), followed by 2 weeks of (four
meetings) computerized BCT. The third condition consisted of 4 weeks (eight meetings) of
computerized BCT. The fourth condition consisted of 4 weeks (eight meetings) of computerized
SCT. Participants completed a total of 10-meetings, consisting of 8-training meetings, one post-
training assessment meeting, and a 1-month follow-up assessment meeting.

The three hypotheses were that SCT would produce greater responses on the (1) SCS and
the (2) CAMM compared to BCT, and there would be meaningful change on the (3) DASS. The
findings obtained in this study did not support the three main hypotheses.

This study found that the eight sessions of BCT, SCT, or their combination was
associated with increases in overall reports of mindfulness and self-compassion. Similar to
findings with previous studies using an adult population (Levinson et al., 2014; Alberston et al.,
2014), across all conditions, there was an overall positive trend in mindfulness and self-
compassion reported regardless of the condition the participants were randomized. In particular,
eight sessions of BCT was associated with increases in overall mindfulness for 5 out of 5
participants and self-compassion for 2 out of 5 participants. Eight sessions of SCT was
associated with increases in overall mindfulness for 2 of the 5 participants and self-compassion
for 2 of 5 participants. SCT appeared to significantly increase reported mindfulness in fewer
participants than the participants that received BCT. However, on the group level, both groups significantly increased mindfulness.

When conducting a small-scale randomized controlled trial four sessions of BCT compared to four sessions of SCT, there was no significant difference found on overall mindfulness or self-compassion. This finding suggests a different expected outcome from our hypothesized findings extrapolated from the research. It was expected that self-compassion would produce greater responses measures of mindfulness and self-compassion (Neff & Dahm, 2015).

This study also found that both constant series of breath counting training and self-compassion training increased immediate post-session felt experience of mindful awareness and self-compassion. At the end of all sessions across all conditions, participants were asked two questions. The first question measuring immediate post-experience mindful awareness, was, “Where was your attention during the activity?” and the responses options were on a 6-point likert scale (1 = completely off-task, 6 = completely on-task). The second question measuring immediate post-experience self-compassion, was, “How much self-compassion did you feel during the activity?” with response options on a 6-point likert scale (1 = least, 6 = most). Mindfulness was measured with the CAMM and self-compassion was measured with the SCS-SF in an adolescent sample.

When analyzing four sessions of SCT following four sessions of BCT, a positive level change was found in the immediate post-session felt experience of both mindful awareness and self-compassion. Therefore, there appeared to be an additive effect on immediate felt experience of mindful awareness and self-compassion with SCT followed BCT. This finding is more in line with previous reports (Neff & Dahm, 2015). This finding may allude to immediate effect of SCT
and warrant the exploration of immediate versus overtime/ across time experience of self-compassion.

Further analysis of immediate post-session felt mindful awareness and self-compassion yielded interesting findings. Across eight sessions of SCT, findings show a significant increasing trend in the immediate post-session felt experience of self-compassion. Findings for this group did not produce a significant increase in post-session felt experience of mindful awareness. Although increased immediate post-session mindful awareness was not produced, participants still indicated that they had a felt experience that was above the mid-point rating of mindful awareness. The lack of increased immediate post-session mindful awareness across time do not support previous findings, that self-compassion increases mindfulness along with self-compassion (Neff & Dahm, 2015). However, these findings may change with in-person teaching of self-compassion instead of audio-led. There may also be different findings if greater levels (duration of sessions and home practice compliance) of self-compassion are administered, although these interpretations or predictions cannot be made from this study.

Additional findings show across eight sessions of BCT, one participant (P36), exhibited an increasing trend in immediate post-session felt experience of mindful awareness and weekly mindfulness ratings. Although there was not a significant positive trend produced, participants reported moderate levels of mindful awareness immediately post-session across sessions. These findings add to the limited mindfulness research with adolescents by revealing a discrepancy between moderate immediate felt experience and lack of significant increase of the participant’s experience.

Moreover, across eight sessions of SCT, two participants (P24 and P25) exhibited an increasing trend in immediate post-session felt experience of self-compassion and weekly self-
compassion ratings. Alberston, Neff, and Dill-Shackleford (2014) found that audio-led self-compassion increased self-compassion. Neff and Germer (2012) also found that self-compassion training increased self-compassion.

The results of this study suggest that a four week computerized BCT and/or SCT program can significantly increase mindfulness and self-compassion skills. Furthermore, in all four groups, mindfulness and self-compassion scores at the 30-day follow-up were not significantly different than post-treatment score. These findings suggest that the mindfulness and self-compassion gains maintained 30 days post treatment. These findings are important as we seek ways to reach youth with technology across school and healthcare settings. If findings continue to support the benefits of computerized mindfulness, these computerized programs may be an asset in school and healthcare settings where practitioner time is limited or rural areas where practitioners are unavailable.

Interestingly, findings for psychological distress were not consistent with previous findings (Albertson, Neff, and Dill-Shackleford, 2014; Neff & Dahm, 2015). Tan and Martin (2015) reported that in an adolescent sample using a mindfulness intervention, mindfulness increased and psychological distress decreased, measured by the DASS-21. Our findings yielded alternative discoveries than MacBeth and Gumley (2012), which reported that self-compassion, is inversely associated with depression, anxiety, stress, which is overall understood as psychological distress. Therefore, as self-compassion increases, psychological distress should decrease. All conditions failed to produce a significant decrease in psychological distress measured by the DASS-21. In fact, in one condition, the self-compassion constant series, the latter half of treatment (assessment session two to post-treatment) yielded an increase in psychological distress.
The small sample size of this study is a limitation and restricts the extent of external validity and generalizability of our findings to other adolescent populations. There are several limitations to the claims we can make as to why psychological distress did not decrease. It is important to illuminate that coincidentally, these trainings across all four groups ended around the same time at the end of the school year when final exams were occurring. The end of year final exams may have been a competing variable. A majority of participants were seniors, uncertain of their plans or finalizing their plans for life after graduation (i.e., living arrangements, college, community college, job, vocational training). Additionally, a part of self-compassion is to think about the distressing material and learn to accept and embrace the distress with compassion. This may be more challenging for adolescents than adults, since adolescence is a period when identity, worldviews, and coping strategies are still developing. It also may be the case that even though we hypothesized and created the program from the literature (MacBeth & Gumley, 2012; Neff, 2003b; Vettese, Dyer, Li, and Wekerle, 2011), the intervention may not have been potent enough (not enough sessions, session were not long enough, lack of home practice compliance). Participants exhibited low home practice compliance and did not complete formal homework assignments between sessions. Their homework assignments were to log onto e-learning and complete the audio-led BCT or SCT exercises daily. Quach, Gibler, & Jastrowski Mano (2017) also found that low home practice compliance was linked to increases in reported stress. Participants reported using BCT and/or SCT post-treatment at their 30-day follow-up meeting. However, there were no e-learning log-ins between post-intervention and the 30-day follow-up time period. Revealing a possible less formal engagement with mindfulness skills learned. Future studies would benefit from exploring the effects of participants receiving increased amounts of exposure to mindfulness and self-compassion exercises and examine the
possible impact that increased exposure may have on outcome measures such as the CAMM, SCS-SF, and DASS-21.

Funding
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REFERENCES


Miller, B. K., & Ruggs, E. N. (2014). Measurement invariance tests of the impression management sub-scale of the balanced inventory of desirable responding. Journal of Personality and Individual Differences, 63, 36-40. doi: 10.1016/j.paid.2014.01.037


Appendix A

Flow Chart of Consent Process
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<th>Consent form sent home to caregiver/legal guardian</th>
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<tr>
<td>Follow-up meeting or phone call requested?</td>
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<th>Assent meeting scheduled with teen</th>
<th>Child unable to participate</th>
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<th>Child unable to participate</th>
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<tr>
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Appendix B

Demographic Background Questionnaire – Teen
Demographic Background Questionnaire - TEEN

Sex: M  F

Date of Birth: __________

Age __________

Grade in school __________

Write in the number(s) that gives the best answer to the following question.

My ethnicity is: __________

(1) Asian or Asian American, including Chinese, Japanese, and others
(2) Black or African American
(3) Hispanic or Latino, including Mexican American, Central American, and others
(4) White, Caucasian, Anglo, European American, not Hispanic
(5) American Indian/Alaska Native American
(6) Mixed, Parents are from two different groups
(7) Other (write in): __________

1a. Imagine that this ladder pictures how American society is set up.

• At the top of the ladder are the people who are the best off—they have the most money, the highest amount of schooling, and the jobs that bring the most respect.
• At the bottom are people who are the worst off—they have the least money, little or no education, no job or jobs that no one wants or respects.

Now think about your family. Please tell us where you think your family would be on this ladder. Fill in the circle that best represents where your family would be on this ladder.
Appendix C

Balance Inventory of Desirability Responding – Impression Management Scale
Using the scale below as a guide, write a number next to each statement to indicate how much you agree with it.

1  2  3  4  5  6  7

NOT TRUE    SOMEWHAT TRUE    VERY TRUE

___ 1. I sometimes tell lies if I have to.
___ 2. I never cover up my mistakes.
___ 3. There have been occasions when I have taken advantage of someone.
___ 4. I never swear.
___ 5. I sometimes try to get even rather than forgive and forget.
___ 6. I always obey laws, even if I’m unlikely to get caught.
___ 7. I have said something bad about a friend behind his or her back.
___ 8. When I hear people talking privately, I avoid listening.
___ 9. I have received too much change from a salesperson without telling him or her.
___ 10. I always declare everything at customs.
___ 11. When I was young I sometimes stole things.
___ 12. I have never dropped litter on the street.
___ 13. I sometimes drive faster than the speed limit.
___ 15. I have done things that I don’t tell other people about.
___ 16. I never take things that don’t belong to me.
___ 17. I have taken sick-leave from work or school even though I wasn’t really sick.
___ 18. I have never damaged a library book or store merchandise without reporting it.
___ 19. I have some pretty awful habits.
___ 20. I don’t gossip about other people’s business.
Appendix D

Self-compassion – Short Form
Original SCS-SF

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering.

To the left of each item, indicate how often you have behaved in the stated manner

Use the following scale:

<table>
<thead>
<tr>
<th>Almost never</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Almost Always</th>
</tr>
</thead>
</table>

1. When I failed at something important to me I became consumed by feelings of inadequacy.
2. I tried to be understanding and patient toward those aspects of my personality I don’t like.
3. When something painful happened I tried to take a balanced view of the situation.
4. When feeling down, I felt like most other people are probably happier than I am.
5. I tried to see my failings as part of the human condition.
6. When I was going through a very hard time, I gave myself the caring and tenderness I needed.
7. When something upsets me I try to keep my emotions in balance.
8. When I failed at something that was important to me, I felt alone in my failure.
9. When I felt down I tended to obsess and fixate on everything that’s wrong.
10. When I felt inadequate in some way, I tried to remind myself that feelings of inadequacy are shared by most people.
11. I was disapproving and judgmental about my own flaws and inadequacies.
12. I was intolerant and impatient towards those aspects of my personality I don’t like.
Altered SCS-SF

**HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES**

Please read each statement carefully before answering.

*To the left of each item, indicate how often you have behaved in the stated manner since our last meeting*

Use the following scale:

<table>
<thead>
<tr>
<th>Almost never</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Almost Always</th>
<th>5</th>
</tr>
</thead>
</table>

1. When I failed at something important to me I became consumed by feelings of inadequacy.  
2. I tried to be understanding and patient toward those aspects of my personality I don’t like.  
3. When something painful happened I tried to take a balanced view of the situation.  
4. When feeling down, I felt like most other people are probably happier than I am.  
5. I tried to see my failings as part of the human condition.  
6. When I was going through a very hard time, I gave myself the caring and tenderness I needed.  
7. When something upsets me I try to keep my emotions in balance.  
8. When I failed at something that was important to me, I felt alone in my failure.  
9. When I felt down I tended to obsess and fixate on everything that’s wrong.  
10. When I felt inadequate in some way, I tried to remind myself that feelings of inadequacy are shared by most people.  
11. I was disapproving and judgmental about my own flaws and inadequacies.  
12. I was intolerant and impatient towards those aspects of my personality I don’t like.
Appendix D

Child and Adolescent Mindfulness Measure – Short Version
**ORIGINAL - CAMM-SF**

*We want to know more about what you think, how you feel, and what you do. Read each sentence. Then, circle the number that tells *how often* each sentence was true for you.*

<table>
<thead>
<tr>
<th></th>
<th>Never True</th>
<th>Rarely True</th>
<th>Sometimes True</th>
<th>Often True</th>
<th>Always True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I got upset with myself for having feelings that don’t make sense.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. At school, I walked from class to class without noticing what I was doing.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I kept myself busy so I didn’t notice my thoughts or feelings.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I told myself that I shouldn’t feel the way I’m feeling.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I pushed away thoughts that I don’t like.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. It was hard for me to pay attention to only one thing at a time.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I got upset with myself for having certain thoughts.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I thought about things that have happened in the past instead of thinking about things that are happening right now.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. I thought that some of my feelings are bad and that I shouldn’t have them.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. I stopped myself from having feelings that I didn’t like.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
### ALTERED - CAMM-SF

We want to know more about what you think, how you feel, and what you do. **Read** each sentence. **Then,** circle the number that tells **how often each sentence was true for you since our last meeting.**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
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<td>Never True</td>
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</tr>
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<td>1</td>
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<td>3</td>
</tr>
<tr>
<td>3. I kept myself busy so I didn’t notice my thoughts or feelings.</td>
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<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. I told myself that I shouldn’t feel the way I’m feeling.</td>
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<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
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<td>0</td>
<td>1</td>
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<td>3</td>
</tr>
<tr>
<td>6. It was hard for me to pay attention to only one thing at a time.</td>
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<td>2</td>
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<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix F

Depression, Anxiety, Stress Scale – Short Form
Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

**The rating scale is as follows:**

| 0 | Did not apply to me at all - NEVER |
| 1 | Applied to me to some degree, or some of the time - SOMETIMES |
| 2 | Applied to me to a considerable degree, or a good part of the time - OFTEN |
| 3 | Applied to me very much, or most of the time - ALMOST ALWAYS |

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I found it hard to wind down</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>2. I was aware of dryness of my mouth</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>3. I couldn’t seem to experience any positive feeling at all</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>4. I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>5. I found it difficult to work up the initiative to do things</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>6. I tended to over-react to situations</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>7. I experienced trembling (eg, in the hands)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>8. I felt that I was using a lot of nervous energy</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>9. I was worried about situations in which I might panic and make a fool of myself</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>10. I felt that I had nothing to look forward to</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>11. I found myself getting agitated</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>12. I found it difficult to relax</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>13. I felt down-hearted and blue</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>14. I was intolerant of anything that kept me from getting on with what I was doing</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>15. I felt I was close to panic</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>16. I was unable to become enthusiastic about anything</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>17. I felt I wasn’t worth much as a person</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>18. I felt that I was rather touchy</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>20. I felt scared without any good reason</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>21. I felt that life was meaningless</td>
<td>0 1 2 3</td>
</tr>
</tbody>
</table>
Appendix G

Breath Counting Training and Self-Compassion Training Follow-up Questions
In the last 30 days, how many days have you used or practiced the Breath Counting Training?

0 – 30 days: please write your response________________.

In the last 30 days, how many days have you used or practiced the Self-Compassion Training?

0 – 30 days: please write your response________________.
Appendix H

HSIRB Approval
Date: February 12, 2016

To: Scott Gaynor, Principal Investigator
   Justin Moore, Student Investigator for dissertation

From: Daryle Gardner-Bonneau, Ph.D., Vice Chair

Re: HSIRB Project Number 15-12-19

This letter will confirm that your research project titled “Examination of the Effects of Breath Counting Training and Self-Compassion Training with Adolescents” has been approved under the full category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may only be conducted exactly in the form it was approved. You must seek specific board approval for any changes in this project (e.g., you must request a post approval change to enroll subjects beyond the number stated in your application under “Number of subjects you want to complete the study”). Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

Reapproval of the project is required if it extends beyond the termination date stated below.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: December 15, 2016