AN ADAPTATION OF THE *MINDFUL SCHOOLS* CURRICULUM FOR ADOLESCENTS WITH AUTISM SPECTRUM DISORDER: IMPLEMENTATION FEASIBILITY AND IMPACT ON ANXIETY, RIGIDITY, AND MINDFULNESS

by

Mackenzie L. Boon

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STATEMENT OF DISSERTATION APPROVAL

The dissertation of **Mackenzie L. Boon**

has been approved by the following supervisory committee members:

Elaine Clark	, Chair	**02/27/2017** Date Approved
Julia Connelly	, Member	**02/27/2017** Date Approved
Aaron Jason Fischer	, Member	**02/27/2017** Date Approved
Michael K. Gardner	, Member	**02/27/2017** Date Approved
Janiece L. Pompa	, Member	**02/27/2017** Date Approved

and by **Anne E. Cook**, Chair of

the Department of **Educational Psychology**

and by David B. Kieda, Dean of The Graduate School.

ABSTRACT

Despite the burgeoning interest in mindfulness and its applications, relatively few mindfulness research studies have been conducted with children and adolescents, particularly in regard to those with autism spectrum disorder (ASD) and comorbid internalizing symptoms. Moreover, there is a lack of peer-reviewed, published studies regarding the effectiveness of the *Mindful Schools* curricula. Therefore, the current study evaluated implementation feasibility and effectiveness of an adapted *Mindful Schools* intervention taught to adolescents with ASD in an outpatient clinical setting. In total, 14 adolescents from the Intermountain West consented to participation in the study. A single-subject, multiple-baseline design across three groups was used to assess intervention feasibility and effectiveness. Dependent variables included participant retention and group completion; treatment integrity; intervention acceptability; and adolescent anxiety, rigidity, and mindfulness, as measured by both self- and parent-reports.

Results showed that it is feasible to implement the adapted *Mindful Schools* intervention with adolescents diagnosed with ASD in an outpatient clinical setting over a 9-week period. This is evidenced by a high rate of participant group completion, strong group leader adherence to the treatment protocol, and favorable satisfaction ratings from both adolescents and parents. Ratings on pre- and posttreatment measures, however, showed minimal impact on adolescent anxiety, rigidity, and mindfulness following the

9-week intervention.

Specifically, Tau-U calculations showed limited to no overall intervention effect (Tau-U = -.09) on daily ratings of anxiety, despite all adolescents self-reporting symptoms of anxiety prior to intervention. Responses to the study-developed rigidity rating scale indicated that 6 out of 10 adolescents and parents observed a slight decrease in adolescent rigidity following intervention, although responses were highly variable both within and across groups. Finally, after eliminating an outlier, results showed little change, on average, in personal mindfulness following intervention, despite reports of practicing mindfulness.

This study demonstrated that it is feasible to deliver an adapted mindfulness intervention to adolescents with ASD; however, effects on anxiety, rigidity, and mindfulness were minimal following the 9-week intervention. Future studies should aim to identify factors that impact response to mindfulness-based treatment for adolescents with ASD, as well as the development of sensitive and specific research measures.

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CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

Adolescence is a time of significant growth and change, and is often regarded as a period of "storm and stress." This developmental period is not only characterized by physical changes, such as puberty, but also by changes in peer groups, social supports, and an emerging desire for autonomy and independence (Schraml, Perski, Grossi, & Simonsson-Sarnecki, 2011). Given these and other changes that adolescents experience, it is easy to understand how this period of life places greater stress on young people as they encounter pressures across settings from peers, parents, and teachers (Rahdar & Galván, 2014).

While teens report increased levels of stress, particularly during the school year, they appear to be less aware of the impact that stress can have on their physical and mental health. Specifically, teens report that their stress has little to no impact on their health, even though they experience symptoms similarly to adults. Research suggests that stress may manifest for teens as irritability, anger, tiredness, or anxiety, which may ultimately impact sleep, gastrointestinal health, frequency of exercise, self-esteem, and eating habits (American Psychological Association, 2014). While all of the problems outlined are concerning to the health of adolescents, the impact of anxiety may be the most alarming, particularly given its prevalence. According to Merikangas and colleagues

(2010), the lifetime prevalence of anxiety among children ages 13 to 18 years old is 31.9%, with females experiencing higher rates of anxiety than males. In other words, almost one in three youth are likely to experience anxiety at some point during adolescence, with age of onset starting as early as six. This is especially troubling, since youth who are experiencing internalizing symptoms typically receive the same level of mental health services as nonsymptomatic peers (Bradshaw, Buckley, & Ialongo, 2008). This, in addition to the fact that many teens often do not know what to do to manage their symptoms (American Psychological Association, 2014), highlights the importance of making coping strategies accessible for teens.

Autism Spectrum Disorder and Associated Anxiety and Rigidity

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by impairments in social communication and reciprocal social interaction, as well as stereotyped behaviors and interests (American Psychiatric Association, 2013). It is estimated that approximately one in 68 children in the United States have ASD, with a significantly larger number of males identified compared to females (Centers for Disease Control and Prevention, 2014). The risk of anxiety and depression are reportedly higher for children and adolescents who have ASD, regardless of autistic symptoms, cognitive ability, or age (Strang et al., 2012). In some cases, anxiety symptoms experienced by adolescents with ASD have been found to be distinguishable from core ASD symptoms (Renno & Wood, 2013). Still, there remains much debate as to the relationship between anxiety and ASD severity, with some researchers suggesting fewer anxiety symptoms in youth with more severe ASD symptoms (Kerns et al., 2014).

Given continued debate regarding symptom presentation, comorbidity estimates of anxiety for youth with ASD vary greatly, ranging from 11 to 84% (White, Oswald, Ollendick, & Scahill, 2009). More recent meta-analytic research suggests, however, that approximately 40% of youth diagnosed with ASD experience a comorbid anxiety disorder (van Steensel, Bögels, & Perrin, 2011). Common comorbid anxiety disorders include the following: specific phobia, social phobia, generalized anxiety disorder, obsessive-compulsive disorder (OCD), and separation anxiety disorder (Nadeau et al., 2011; van Steensel et al., 2011; White et al., 2009). Inconsistences in the literature further exist regarding prevalence rates for specific anxiety disorders in youth populations with ASD. The many different ways that anxiety symptoms in ASD are described and assessed appears to largely influence reported prevalence rates (Kerns et al., 2014). To date, there is no gold standard for assessing anxiety disorders in youth with ASD. Kerns and colleagues (2016) recently proposed a four-factor framework for differential diagnosis of anxiety disorders in cognitively-able youth with ASD. The framework is as follows: (1) determine whether presenting anxiety symptoms are over and above what would be expected given then child's developmental level and presenting challenges; (2) determine whether anxiety symptoms cause significant impairment to social and academic functioning, family life, physical health, and general well-being; (3) distinguish fears and worries that characterize anxiety disorders from typical difficulties regulating emotional reactions; and finally, (4) determine whether the anxiety is beyond what is characteristic of ASD. Specific emphasis was placed on the importance of considering age and developmental level, family history, negative life events, and specific skill deficits throughout the assessment process (Kerns et al., 2016).

In general, children and adolescents with ASD appear to express anxiety in both similar and dissimilar ways to known diagnostic definitions (Kerns et al., 2014). Uniquely, youth with ASD and anxiety may display behaviors such as insistence on sameness, inflexible thinking, low tolerance for change and uncertainty, social fearfulness, and repetitive and restricted behaviors (RRBs; Wingham, Rodgers, South, McConachie, & Freetson, 2015; Kerns et al., 2014; Spiker, Lin, Van Dyke, & Wood, 2012). Researchers have also shown that unexpected changes in the sequence of daily events, as well as disruption of functionally ambiguous compulsions and rituals, are likely to cause stress for individuals with ASD (Kerns et al., 2014; Trembath, Germano, Johanson, & Dissanayake, 2012). According to Wingham and colleagues (2015), in anxiety-provoking situations, individuals with ASD often become rigid and show an increase in RRBs in order to "exert some control over the environment and make the world more predictable" (p. 950). This evidence suggests that when facing situations of uncertainty or stress, individuals with ASD are likely to engage in more ritualized, predictable, and rigid behavior patterns in order to cope and minimize threats (Lang, Krátky, Shaver, Jerotijević, & Xygalatas, 2015).

Anxiety comorbidity is further associated with greater impairment in psychosocial functioning. Specifically, adolescents with ASD and anxiety are at increased risk for disruptions across individual, family, and school functioning (Nadeau et al., 2011). Across settings, anxiety in youth with ASD has been associated with the following: irritability, self-injurious behaviors, externalizing behavioral problems, increased automatic negative thoughts, self-reported loneliness, social avoidance, depressive symptoms, sleep problems, and parental stress (Farrugia & Hudson, 2006; Kerns et al.,

2015; Nadeau et al., 2011). Individuals with ASD and anxiety may also express circumscribed worries and impairing and unusual fears (Kerns et al., 2014; Settipani, Puleo, Conner, & Kendall, 2012). Not surprisingly, anxiety in individuals with ASD has been shown to impair daily living skills, exacerbate social deficits, and negatively impact relationships (Vasa et al., 2014), particularly during adolescence when the social milieu becomes more complex (White et al., 2009). Collectively, this evidence highlights the need to teach more appropriate behavior repertoires for coping with uncertainty, as well as the overall demand for interventions that treat internalizing symptoms in adolescents with ASD.

Managing Stress and Anxiety

Stress poses a significant threat to healthy development in adolescence, and is also a strong risk factor for psychopathology (Compas, Connor-Smith, Saltzman, Harding Thomsen, & Wadsworth, 2001; Grant et al., 2003;). In turn, appropriate coping strategies may serve as protective factors against the potentially harmful consequences of stress, such as anger, anxiety, and depression, and have also been found to be associated with overall improved adjustment in adolescence (Compas et al., 2001; Herres, 2015). Unfortunately, many teens report feeling unprepared to handle their stress, highlighting their underdeveloped stress management and coping skills (American Psychological Association, 2014). Perhaps even more unsettling is the dearth of evidence-based, accessible interventions aimed at teaching healthy emotional and coping skills to adolescents (Broderick & Jennings, 2012).

Over the past decade, mindfulness-based interventions (MBIs) have grown in

popularity, primarily due to increased public awareness and empirical evidence demonstrating the effectiveness of the method in treating a wide range of symptoms, including stress and anxiety, for various populations (Grossman, Niemann, Schmidt, & Walach, 2004; Hofmann, Sawyer, Witt, & Oh, 2010; Keng, Smoski, & Robins, 2011; Khoury et al., 2013; Kocovski, Fleming, Hawley, Huta, & Antony, 2013). While trait mindfulness, or a mindful disposition that permeates daily life (Bluth & Blanton, 2014), appears to predict lower negative affect from day-to-day, simply being in a mindful state has been associated with more positive well-being for individuals across the lifespan (Brown, Ryan, & Creswell, 2007). For adolescents in particular, facets of mindfulness, including nonreactivity, nonjudgment, and acting with awareness, appear to create greater capacity to accept the occurrence of stressors, respond flexibly, and not dwell on specifics. This response has been found to decrease rumination and dysphoric mood (Ciesla, Reilly, Dickson, Emanuel, & Updegraff, 2012). In other words, "mindful [adolescents] have a higher capacity to handle stressors without experiencing negative psychological and physiological outcomes" (Ciesla et al., 2012, p. 761). Ultimately, this research suggests that, for adolescents, mindfulness "buffers" against the effects of stressful life events (Ciesla et al., 2012).

While there is general agreement that mindfulness is a healthy attribute (Ciesla et al., 2012), the best method to teach mindfulness skills to adolescents remains unclear. In particular, limited research exists examining the effectiveness of structured MBI use with adolescents. Given the positive results demonstrated with adult populations, as well as the number of adolescents experiencing serious problems with stress and anxiety, additional research is needed; this is especially true for adolescents with ASD.

Mindfulness Origins and Definition

Jon Kabat-Zinn, the founder of Mindfulness-Based Stress Reduction (MBSR), and the current Executive Director of the Center for Mindfulness in Medicine, Health Care, and Society, pioneered mindfulness-based programs in the United States. MBSR is a manualized treatment program that was created in 1979 at the University of Massachusetts Medical School Stress Reduction Clinic to help people with chronic pain and stress-related disorders (Bishop et al., 2004; Gazella, 2005). Since then, hundreds of programs modeled after MBSR have made their way into hospitals, medical centers, and clinics, generating increased attention from researchers and academics alike. The use and value of MBIs have been increasingly supported through strong scientific evidence as a treatment for many illnesses and disorders (Kabat-Zinn, 2013).

Simply put, mindfulness is "moment-to-moment, non-judgmental awareness" (Gazella, 2005, p. 59). A more widely used and accepted definition by Kabat-Zinn (2005) describes mindfulness as "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (p. 4). The concept of mindfulness has roots in Buddhist meditation and other contemplative traditions (Brown & Ryan, 2003), but mindfulness itself is impartial to any particular religious practice or faith-based worldview. Operationally, mindfulness consists of two components: (1) self-regulation of attention and (2) awareness, or an orientation toward one's experiences in the present moment (Bishop et al., 2004). More specifically, *attention* refers to the active focusing of attention, resulting in heightened sensitivity to phenomena within a limited range of experience, while *awareness* signifies subjective monitoring of both internal and external stimuli (Brown & Ryan, 2003).

A person can be in a mindful state (i.e., an immediate experience of being mindful) or a person can develop the trait of mindfulness, which is a disposition that permeates daily life (Bluth & Blanton, 2014). Mindfulness as an outcome can be described as a "state or trait in which an individual becomes increasingly aware and attentive in the moment" (Bluth & Blanton, 2014, p. 1299). Mindfulness as a process is referred to as mindfulness practice, which is a daily time set aside to practice technique and encourage the condition of mindfulness. Mindfulness practice is a reflective mind-body discipline that includes techniques, such as breath awareness, mindful movement (gentle yoga), body awareness, or body scanning (Bluth & Blanton, 2014), as well as heartfulness, which encourages compassion, gratitude, and generosity (Black & Fernando, 2014).

Mindfulness, simply, is a practice of nondoing and a practice of being. As Kabat-Zinn (2005) describes:

> We aren't practicing to make things perfect or to do things perfectly. Rather, we practice to grasp and realize (make real for ourselves) the fact that things are already perfect, perfectly what they are. This has everything to do with holding the present moment in its fullness without imposing anything extra on it, perceiving its purity and the freshness of its potential to give rise to the next moment. (p. 45)

Therefore, if an emotion or sensation, such as joy or even anxiety, is experienced during practice, it is to simply be felt and accepted without judgment. No experience is inferior or superior to another, regardless of pleasantness. Instead, acceptance is cultivated through a nonreactive attitude, and, in practice, openness and curiosity are encouraged, ultimately making feelings and experiences nonthreatening (Bluth & Blanton, 2014). In essence, MBIs allow a person to dis-identify or decenter and reperceive phenomena from a clear, nonjudgmental stance. This objective observation of experience shifts awareness

and, in turn, has been found to positively affect related psychological processes (Felver, Doerner, Jones, Kaye, & Merrel, 2013). As Shapiro, Carlson, Astin, and Freedman (2006) describe, mindfulness "works" when an individual embodies intention, attention, and attitude (IAA) as fundamentals in an interwoven, cyclic process.

Mindfulness-Based Interventions With Adults

A number of MBIs presently exist, including the following: Mindfulness Based Stress Reduction (MBSR; Kabat-Zinn, 1982), Mindfulness Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002), Dialectical Behavior Therapy (DBT; Linehan, 1993), and Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999). These MBIs are offered across a variety of settings, such as clinics, hospitals, schools, prisons (Kabat-Zinn, 2003), and, more recently, online (Jayewardene, Lohrmann, Erbe, & Torabi, 2017). There is evidence to suggest that the above-listed MBIs result in positive effects for both clinical and nonclinical, healthy populations (Grossman et al., 2004). Specifically, mindfulness has been found to decrease chronic pain, stress, anxiety, depression, blood pressure, and obesity, resulting in diminished use of medication and increased motivation to make lifestyle changes. For providers, MBIs have been found to positively affect medical decision-making and adherence to treatment protocols (Ludwig & Kabat-Zinn, 2008; Ruff & Mackenzie, 2009). Meta-analytic research, including 209 studies, suggests moderate overall effects (Hedges' $g = .55$) of mindfulness in pre-post comparisons, with the greatest effects noted in treating psychological, rather than physical and medical, conditions (Khoury et al., 2013).

MBSR, one of the most widely studied MBIs, is a clinically-based manualized

group intervention that offers intensive training in mindfulness meditation and encourages group participants to relate to their conditions in more accepting and nonjudgmental ways. A detailed outline of MBSR is warranted, given its popularity and similarity to other mindfulness interventions. The MBSR program consists of an 8-week course, including weekly classes and one all-day silent retreat (Kabat-Zinn, 2014). Weekly home assignments, typically lasting 45 min, are also included. “Informal practice” is additionally encouraged, which simply means being fully present in and aware of everyday, routine activities (Kabat-Zinn, 2013). The formal techniques taught in the MBSR intervention are as follows: sitting meditation (giving full attention to the breath, nonjudgmentally noting feelings as they arise and gently escorting attention back to the breath); body scan meditation (gradually scanning the body from toes to head, tuning into any and all sensations without judgment); gentle hatha yoga (slow stretching and strengthening exercises that focus awareness on the breath as the body is configured into various postures); and walking meditation (intentionally attending to the felt experience and sensations of walking; Kabat-Zinn, 2013). The overall focus of the program is for participants to develop greater understanding and awareness of the body, mind, and body-mind interactions, ultimately resulting in more effective coping with the challenges and demands of everyday life (Kabat-Zinn, 2014).

The benefits of MBSR were first described for patients with chronic pain (Kabat-Zinn, 1982). Since then, countless research studies have been conducted. The results indicate that MBSR is an effective intervention for both mental and physical conditions, such as pain, heart disease, fibromyalgia, cancer, depression, anxiety, and stress, with benefits noted in both clinical and nonclinical populations (Grossman et al., 2004).

Further, there is evidence to suggest that shortened versions of MBSR are just as effective as the standard 8-week course, which is promising for both providers and participants, particularly in regards to time commitment (Carmody & Baer, 2009).

Kabat-Zinn's work and the MBSR program have inspired subsequent interventions, such as MBCT (Segal, Williams, & Teasdale, 2002). While the programs are similar in many ways (i.e., class structure and format), MBCT is unique in that it encourages participants to turn towards negative thoughts and low mood from the outset of the program in order to become familiar with the experience and symptoms. The program then teaches skills that allow individuals to disengage from habitual and dysfunctional cognitive routines. MBCT has been found to be an efficacious treatment, when used alongside usual care, to decrease depression relapse and recurrence (Chiesa & Serretti, 2011).

DBT (Linehan, 1993) and ACT (Hayes et al., 1999) are different than MBSR and MBCT, in that these programs include mindfulness as one component of a larger treatment package. DBT was initially designed to treat emotional dysregulation and the behavioral difficulties associated with characteristics of Borderline Personality Disorder (BPD). In addition to mindfulness, DBT consists of distress tolerance, emotion regulation, and interpersonal effectiveness. Standard DBT is an outpatient therapy treatment involving individual psychotherapy, group skills training, and access to telephone coaching, as needed. Over the past decade, DBT has been found to be effective for adult patients with symptoms of emotional instability, cognitive disturbance, self-harming behavior, interpersonal problems, poor anger management, and poor impulse control. In particular, DBT has emerged as a promising treatment for angry and

aggressive behaviors in adults (Frazier & Vela, 2014). In comparison, ACT (Hayes et al., 1999) consists of six total components, including present moment awareness; acceptance of difficult emotions/thoughts; decreasing believability (or attachment to) thoughts; perspective-taking; identification of values; and committed action in service of values. As can be seen, present moment awareness is the most closely related to mindfulness. Together, all six processes are thought to reduce experiential avoidance, or the attempt to alter unwanted, private thoughts, feelings, or physiological sensations. Positive outcomes following ACT intervention have been found for adults with problems such as substance abuse, high-risk sexual behaviors, exhibitionism, posttraumatic stress disorder (PTSD), self-harm, and smoking. Similar to DBT, emerging evidence suggests that ACT may be an effective treatment to decrease both physical aggression and threats of aggression towards others (Zarling, Lawrence, & Marchman, 2014).

Mindfulness Research With Children and Adolescents

While the bulk of mindfulness research has been conducted with adults, over the past few years there has been an increase in research with children, and, in particular, adolescents. Biegel, Brown, Shapiro, and Schubert (2009) examined the effects of an adaptation of MBSR for teens (age 14-18), utilizing a randomized clinical trial. The adapted intervention consisted of eight weekly, 2-hour classes held in an outpatient facility. The intervention placed primary focus on developing intention, attention, and attitude (IAA; Shapiro et al., 2006). In comparison to treatment-as-usual, those receiving the adapted MBSR intervention self-reported reduced symptoms of anxiety (d = .70-.79), depression (d = .95), and stress (d = .89), as well as increased self-esteem (d = .59) and

sleep quality (*d* = .14). Teens in the MBSR group diagnosed with a mood disorder further demonstrated significant diagnostic improvement from pre- to posttreatment, with prevalence rates decreasing by 32.3%. Overall, this study highlights the benefits of using MBSR as an adjunct to mental health treatment for adolescents in an outpatient facility (Biegel et al., 2009).

More recently, a meta-analysis by Zoogman, Goldberg, Hoyt and Miller (2014) examined the effect size, outcomes, and treatment moderators of mindfulness-based interventions (i.e., MBSR or MBCT) with individuals 18 years old and younger. Specific subgroups were not examined, given the limited data on mindfulness with youth. Based on exclusion and inclusion criteria, the literature search resulted in a total of 20 quantitative studies from 2004 to 2011. Analyses resulted in a primary omnibus effect size (*del* = 0.227) in the small to moderate range, with a higher magnitude of effect evidenced for clinical populations (*del* = 0.500). MBIs were found to significantly decrease symptoms of psychopathology (*del* = 0.373) and increase mindfulness and attention (*del* = 0.280). Taken together, these results suggest that MBIs may be particularly beneficial in treating youth with current psychopathology symptoms. Zoogman and colleagues (2014) noted, however, that more research is needed that investigates the effects of MBIs on youth populations in clinical settings, given the fact many of the mindfulness studies with young people have been conducted in educational settings.

Mindfulness Research With Individuals With ASD

While mindfulness practices and interventions have grown in popularity, the field of mindfulness is still clearly in its infancy. This is, in part, evidenced by the lack of available research addressing the effects of mindfulness on individuals with ASD. Spek, van Ham, and Nyklíček (2013) conducted the first controlled trial of mindfulness-based therapy involving adults with ASD, and found that the intervention resulted in significant reductions in anxiety (d = .76), depression (d = .78), and rumination (d = 1.25). More recently, Kiep, Spek, and Hoeben (2014) administered an adapted mindfulness-based intervention to 50 adults with ASD. Adaptations included elimination of (1) examination of one's thoughts and (2) metaphors and ambiguous words or sentences that required imaginative skills. The program was extended by 1 week, allowing for increased practice during sessions as well as increased processing time. In total, the program was 9 weeks long, with groups held for 2½ hours each. Homework was required and was reviewed during each group session to improve at-home practice planning. Results showed decreased self-reported symptoms of anxiety, depression, somatization, and sleep problems. Positive affect further increased and rumination significantly decreased. All symptoms remained stable at 9 weeks follow-up (Kiep, Spek, & Hoeben, 2014). Although limited in scope, the above-listed results suggest that MBIs are promising interventions to treat symptoms of anxiety, depression, and rumination in adults with ASD. Mindfulness Interventions Specific to Youth with ASD.

There have also been a number of studies that have shown beneficial effects of MBIs for children and youth with ASD. This includes the Soles of the Feet (SoF) intervention developed by Singh, Wahler, Adkins, and Myers (2003). SoF was initially

designed to help an adult with an intellectual disability and mental illness manage his aggressive behaviors by diverting his attention away from an emotionally arousing stimulus to a neutral stimulus. Singh and colleagues (2003) concluded that the SoF intervention effectively increased self-control and allowed the adult participant to self-regulate both his verbally and physically aggressive behaviors. Specifically, verbal aggression reduced from a mean occurrence of 10.0 at baseline to a postintervention mean occurrence of 0.0. Physical aggression similarly reduced from 15.4 to 0.0 at follow-up. Beneficial SoF effects for adults with aggressive behaviors have further been demonstrated in a community placement setting (Singh et al., 2007b). Moreover, this intervention has been found to be effective for adolescents with conduct disorder, successfully decreasing their aggressive behavior to socially acceptable levels in school (Singh et al., 2007a). Given the beneficial effects of the SoF mindfulness-based intervention, particularly in decreasing verbal and physical aggression, researchers then turned their focus to the effects of mindful parenting (Singh et al., 2007c), before returning to examine the effects of the SoF intervention on the behaviors of adolescents with ASD (Singh et al., 2011a).

In general, there appear to be three broad categories of mindfulness research with youth with developmental disabilities, including (1) mindful training for parents to influence the behavior of their child or children, (2) a combination of mindfulness training to address both parenting and children's problem behaviors simultaneously, and (3) mindfulness training for children or parents exclusively, without examining the effects on each other (Hwang, Kearney, Klieve, Lang, & Roberts, 2015). First, Singh and colleagues (2007c) found that mindful parenting decreased aggressive behaviors and

increased social skills for four children with developmental disabilities. Results also indicated increased satisfaction with parenting and decreased parental stress. Similarly, Conner and White (2014) further concluded that increased maternal levels of trait mindfulness served as a protective factor against increased levels of parental stress. As Neece (2014) describes, "mindfulness may help parents to slow down, notice impulses before they act, really listen to their children, and come to a more relaxed and peaceful state of mind" (p. 177), ultimately resulting in better self-control during interactions. Beneficial results of mindful parenting have also been noted in separate studies (Bazzano et al., 2015; Lewallen and Neece, 2015; Neece, 2014; Singh et al., 2006; Singh et al., 2014), including a recent meta-analysis conducted by Cachia, Anderson, and Moore (2016). A review of the literature (utilizing predetermined inclusion criteria) resulted in a total of 10 studies, each across independent sites and involving 142 parents. All studies supported mindfulness as an intervention to reduce parental stress and improve psychological wellbeing. Two out of the 10 studies also indicated concurrent improvements in the aggressive behaviors of the child as a result of mindful parent training. Based on results and criteria from What Works Clearinghouse (WWC), Cachia and colleagues (2016) ultimately concluded that mindfulness interventions can be considered evidence-based procedures for use with parents of children with ASD. Notably, the authors highlight that mindfulness is a cost-effective, short-term intervention with sustainable and lasting impacts for caregivers (Cachia et al., 2016).

Next, de Bruin, Blom, Smit, van Steensel, and Bögels (2014) examined the effects of *MYmind* mindfulness training for adolescents with ASD combined with *Mindful Parenting* training. Adolescents described an increase in quality of life ($d = .63$) and

decrease in rumination (d = -.92) as a result of the training. Beneficial results were also noted for parents, including a decrease in dysfunctional parenting styles (d = -.29) and increased quality of life (d =.34). Similar benefits have been noted in another study (Bögels, Hoogstad, van Dun, de Schutter, & Restifo, 2008) that included parents of children with ASD and other developmental disabilities. Taken together, this research highlights that improved mental health of parents can positively impact both parent-child relationships and children's behavior.

In regards to the third and final category, Singh and colleagues (2011a) studied the effects of the SoF intervention on the aggressive behaviors of three adolescents with ASD. In this study, the researchers trained the adolescents' mothers on the intervention, which they then delivered to the adolescents for 30 min across 5 consecutive days. Once the basics were mastered, the adolescents were encouraged to engage in self-practice, while still practicing the skill twice a day with their mother to encourage use. The intervention continued until the aggressive behaviors of the adolescents had stopped for 4 consecutive weeks, resulting in varying intervention lengths (17 to 24 weeks). Data were collected from participants, parents, and siblings regarding aggressive behaviors, ensuring interrater reliability. Follow-up data were collected every 6 months for a total of three years, ultimately showing that the adolescents engaged in an average of only one or two aggressive acts per year following the intervention. This is a significant improvement from baseline, as all three adolescents engaged in an average of 14 or greater acts of aggression per week at baseline. Similar results were noted in an additional study conducted by Singh and colleagues (2011b) for adolescents with Asperger's syndrome, with gains maintained at four-year follow-up. Overall, this research suggests that

adolescents with ASD may successfully utilize mindfulness-based procedures to control aggressive behavior over time.

A study by Benn, Akiva, Arel, and Roeser (2012) examined the effects of the SMART-in-Education (Stress Management and Relaxation Techniques) program on parents and teachers of children with special needs, including children with ASD. Parents and teachers reported both decreased stress and anxiety, as well as increased personal growth, mindfulness, and self-compassion. These researchers, however, did not examine the impact of the intervention on the children. Moreover, despite Benn and colleagues (2012) findings, there is still little known about the impact of mindfulness interventions on internalizing symptoms for youth with ASD.

It is believed that, in part, individuals with ASD are likely to experience increased levels of anxiety "because they are more likely to react aversively to their emotional experiences, while lacking the ability to identify and understand their emotions" (Maisel et al., 2016, p. 692). MBIs may be helpful in the treatment of poor emotional acceptance and may further help individuals become familiar with a wide range of personal feelings, reducing alexithymia. Learned skills and increased acceptance may also help individuals cope with future uncertainty by drawing focus to the present moment (Maisel et al., 2016). While MBIs for treatment of anxiety in adolescents with ASD appears promising, more research is undoubtedly needed, particularly to identify appropriate intervention protocols across settings, including homes, schools, and clinics.

Mindfulness With Youth in Clinical Settings

Kabat-Zinn (1982) first introduced mindfulness training in a clinical setting, recognizing the utility of the intervention in treating adult, chronic pain patients. Since then, MBIs have been implemented in a variety of settings. For youth, specifically, MBIs have primarily been implemented in outpatient facilities, homes, and schools (Greenberg & Harris, 2012). While there is evidence to suggest that mindfulness is teachable and beneficial for youth populations, some argue that research in this area has only "barely begun" (Semple, Lee, & Miller, 2006, p. 164), and others (Zoogman et al., 2014) specifically highlight the need for additional clinical research.

Given the minimal number of youth studies in comparison to adult populations, Thompson and Gauntlett-Gilbert (2008) outlined specific considerations to keep in mind for effective clinical application with children and adolescents, including the following: (a) greater explanation and rationale may be needed, but keep it simple; (b) emphasize everyday generalizability and incorporate salient examples and teaching tools; (c) use relatable metaphors to explain requirements and techniques; (d) incorporate variety and repetition; (e) consider length of practice and teaching; (f) engage parents; and finally, (g) involve peers and utilize a group format. Similar to the *Mindful Schools* guidelines, Thompson and Gauntlett-Gilbert (2008) highlight the importance of the clinician continually maintaining a personal mindfulness practice. Wood and colleagues (2015) further highlight unique modifications for implementing CBT-like programs in clinical settings for youth with ASD, including a modular implementation format, in-vivo and real-world exposures, easy-to-remember acronyms, and, finally, reward systems for home-based exposures and practice.

Although these modifications are promising, further research is needed to determine specific and appropriate components of effective mindfulness practices with youth. As Greenberg and Harris (2012) describe, "these contemplative interventions represent an opportunity to cultivate positive habits of mind and body and to promote the health and well-being of children and youth in our schools, but more research is necessary" (p. 165). Therefore, the current study utilized an adaptation of the *Mindful Schools™* (www.mindfulschools.org) Adolescent Curriculum (Mindful Schools, 2015) in a clinical setting, and examined effects of the intervention on anxiety, rigidity, and mindfulness practice for adolescents with ASD.

Mindful Schools Curriculum

The intervention group for the present study was referred to as "Mindful Moments for Teens: Living with Stress in a Hectic World" (see Appendix A). The group utilized an adapted, shorter version of the *Mindful Schools* Adolescent Curriculum (Mindful Schools, 2015) in a clinical setting. *Mindful Schools* (www.mindfulschools.org) is an organization that offers mindfulness training courses and manualized curricula. The programs were initially intended for use in under-resourced educational settings, although the curricula have been found to be adaptable to diverse settings, including classrooms, after-school programs, homes, and clinical settings. The lessons are short and simple, facilitating ease of use across settings. *Mindful Schools* requires that all instructors are not only trained in the curriculum, but also have an established, personal mindfulness practice, as this is believed to be the foundation for successful program implementation. Additionally, the program focuses more on the "spirit of mindfulness," as opposed to any

particular technique, emphasizing connection with youth at different developmental stages.

Two separate *Mindful Schools* curricula are available to trained educators, including the Kindergarten – 5th grade curriculum (Mindful Schools, 2014) and the Adolescent (or Middle –High School) curriculum (Mindful Schools, 2015). Specifically, the *Mindful Schools* Adolescent program was designed for children ages 12 to 17, and consists of 18 individual lessons that cover mindfulness techniques, such as breath awareness, body scan, mindful walking, and heartfulnesss. This particular curriculum was chosen given its focus on adolescents. The *Mindful Schools* curricula, in general, are widely used. According to the *Mindful Schools* website, the more than 10,000 *Mindful Schools*-trained educators have impacted over 300,000 children and adolescents in all 50 states and 60+ countries.

While numerous benefits of the program are noted in preliminary research highlights on the *Mindful Schools* website, the current literature search found only three peer-reviewed, published studies to date that have examined *Mindful Schools* intervention feasibility and effects. First, Liehr and Diaz (2010) found that the *Mindful Schools* intervention resulted in significantly lower levels of reported depression over time for minority children in comparison to those receiving health education alone. Nonsignificant decreases in anxiety were further described. All participants were noted to engage completely in the *Mindful Schools* activities with few modifications (i.e., adding in mindful game play).

Next, Black and Fernando (2014) examined the effects of a 5-week mindfulness based program, utilizing the K-5 Curriculum from *Mindful Schools* (Mindful Schools,

2014). The intervention was implemented in 17 elementary classrooms, reaching a total of 409 ethnic minority students. Teachers completed pre- and postintervention ratings on The Student Behavior Rubric developed by Kinder Associates, LLC. Results indicated that teachers reported improved classroom behavior across all domains, including attention, self-control, participation, and caring/respect, with gains maintained at 7 weeks postintervention. Black and Fernando (2014) posited that mindfulness training appears to improve teacher perceptions of classroom behavior, which is likely to benefit the overall learning environment.

Finally, Hesse, Holmes, Kennedy-Overfelt, Kerr, and Giles (2015) utilized an adaptation of the *Mindful Schools* Adolescent Curriculum (Mindful Schools, 2015), combining three lessons into eight, 2-hour sessions delivered weekly in an outpatient treatment facility. The intervention was delivered to adolescent females with chronic headaches. While the curriculum was purposefully not tailored to address headaches, participants were allowed to self-initiate discussion of headaches during overall group discussions. Headache triggers were also openly discussed at the start of the intervention to encourage group members to avoid these, if possible. Participants were further instructed to engage in home practice, listening to a provided guided meditation as often as possible. Participants completed daily diary entries to monitor out-of-session practice as well as headache frequency and severity. Results suggest that this adaptation is a safe and feasible treatment for adolescents with recurrent headaches. Participants reported improved ability to accept headache pain, rather than trying to control it. Parents further indicated improved quality of life and physical functioning of their child, as measured by qualitative responses.

A recent dissertation study, conducted by Haygeman (2016), also utilized an adaptation of the *Mindful Schools* Adolescent Curriculum (Mindful Schools, 2015) with a nonclinical, community-referred adolescent population. Specifically, the intervention was implemented in an after-school setting over a 6-week period, with three of the 18 lessons combined each week into a 2-hour group. Each group incorporated a mindful movement practice, such as gentle yoga or Qi Gong, and further utilized trained, group-leader techniques, including the ABC technique (Levitt, 2015). Results suggested that it is feasible to implement this intervention with the identified population. Data further indicated a decrease in participants' stress from pre- to postintervention [t (20) = 2.79, p < .05] as well as increased well-being [t (19) = -2.82, p < .05]. Adolescents further reported a significant increase in personal mindfulness following the intervention [t (19) = -3.68, p < .05]. Despite these, and other, positive findings regarding the *Mindful Schools* curricula, a need for further program study still clearly exists, particularly for adolescents with ASD.

Purpose of the Current Study

Despite the burgeoning interest in mindfulness and its applications, relatively few mindfulness research studies have been conducted with children and adolescents, particularly in regard to those with ASD and comorbid internalizing symptoms. Moreover, there is a lack of peer-reviewed, published studies regarding the effectiveness of the *Mindful Schools* curricula. Given the limited evidence available, a feasibility and acceptability study is warranted. As outlined by Bowen and colleagues (2009) a feasibility study may be necessary when "there are few previously published studies or

existing data using a specific intervention technique" (p. 453). Following this recommendation, the current study was designed to examine feasibility in terms of participant enrollment and retention; treatment integrity; and intervention acceptability. More specifically, the study sought to determine the extent to which the chosen intervention could be successfully delivered to intended participants; that is, adolescents with ASD.

In order for an intervention to be useful, it must also be practical and accessible. The *Mindful Schools* curriculum appears to be both; however, further research is needed to fill in gaps in knowledge about the curriculum, including the effectiveness of the intervention to address internalizing symptoms of adolescents with ASD. Moreover, the feasibility of using the curriculum in an outpatient clinical setting has limited support. Zoogman and colleagues (2014) described a general need for increased mindfulness research in clinical settings for children and adolescents; this is particularly true for the *Mindful Schools* curriculum, as it was created for use in a public-school setting. Therefore, to address aforementioned gaps in present research and to advance the literature on MBIs for youth with ASD, an adaptation of the *Mindful Schools* Adolescent (Middle – High School) Curriculum (Mindful Schools, 2015), referred to as "Mindful Moments for Teens: Living with Stress in a Hectic World" (see Appendix A) was used. While there are a number of existing programs designed to teach mindfulness skills, the *Mindful Schools* curriculum was chosen given its specific focus on adolescents. Additionally, the *Mindful Schools* curriculum is more easily accessible than other MBIs, with curriculum training available online. While the adapted intervention largely followed the outlined curriculum, small modifications were made in order to allow for

increased participant engagement and opportunity for feedback.

Given the limited evidence currently available in this area, this study was primarily conducted as a feasibility study (Bowen et al., 2009), examining participation, implementation, and acceptability. Pre- and postintervention data analyses were also conducted to explore the effects of the *Mindful Schools* adaptation on anxiety, rigidity, and mindfulness practice. The rationale for each proposed feasibility focus area (Bowen et al., 2009) is described below:

- Participation: It was unknown whether there was a demand for this type of intervention in the present setting with the designated population. Participation was assessed through examination of participant enrollment and retention rate.
- Implementation: It was unknown whether the current adaptation of the curriculum could be delivered as proposed within the current setting with the specified population. Implementation was assessed using a treatment integrity checklist.
- Acceptability: It was unknown whether participants would respond favorably to the adapted *Mindful Schools* curriculum. Acceptability was assessed through participant satisfaction questionnaires.

In light of the current study's findings, future research should aim to examine efficacy, not simply feasibility, on a larger scale.

Research Questions

For the purposes of this study, research questions were divided into two separate categories: (1) intervention feasibility and (2) intervention effectiveness.

Intervention Feasibility

The following research questions were intended to address the aforementioned feasibility focus areas.

1. Did participants regularly attend and remain in the "Mindful Moments for Teens" group throughout the intervention?

   This question was answered using weekly attendance records (see Appendix B for a sample attendance log). Those who attended a minimum of seven group sessions were considered group completers.

2. Did the "Mindful Moments for Teens" group leader adhere to the treatment protocol, and were all of the lessons conducted as planned?

   This question was answered using data from treatment integrity checklists (see Appendix C; adapted from Haygeman, 2015). Notes and comments were made during treatment integrity observations if the treatment protocol was not followed at any time during group sessions. This information was used as qualitative data for determining any factors that impacted planned implementation.

3. Was the present adaptation of the *Mindful Schools* curriculum acceptable to the participants?

   This question was answered using the Children's Intervention Rating Profile (CIRP; Witt & Elliott, 1985; see Appendix D) and the Behavior Intervention Rating Scale (BIRS; Elliott & Von Brock Treuting, 1991; see Appendix E). The CIRP was administered to adolescents at postintervention, and the BIRS was administered to parents at

postintervention.

Intervention Effectiveness

The following research questions were intended to examine potential changes from pre- to posttreatment, above and beyond that of the previous feasibility focus areas.

4. Did participants show evidence of decreased anxiety over the course of the intervention?

    This question was answered using several self-report measures: the Anxiety Scale for Children – Autism Spectrum Disorder – Child Version (ASC-ASD; Rodgers et al., 2015; see http://research.ncl.ac.uk/cargo-ne/ASC.html for reference and free download), a study-developed daily anxiety scale (see Appendix F), and, finally, a study-developed weekly anxiety rating scale (see Appendix G; adapted from Haygeman, 2015). The ASC-ASD was administered to participants at both pre- and postintervention phases. Participants completed the daily anxiety rating scale on a nightly basis at both pre-and postintervention, while the weekly anxiety rating scale was administered weekly at the beginning of each intervention session. Parents completed the Anxiety Scale for Children – Autism Spectrum Disorder – Parent Version (ASC-ASD-P; Rodgers et al., 2015; see http://research.ncl.ac.uk/cargo-ne/ASC.html for reference and free download) at both pre- and postintervention.

5. Did participants show evidence of decreased rigidity over the course of the intervention?

    This question was answered using study-developed rigidity rating scales (self- and parent-report). The adolescent participants and their parents both completed the rigidity rating scale at pre- and postintervention phases (see Appendices H and I). Items for both the self- and parent-report rigidity rating scales were drawn from *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association, 2013), as well as other autism rating scales such as the Social Responsiveness Scale (2nd ed.; SRS-2; Constantino & Gruber, 2012; see a full description in supplemental dependent variables section).

6. Did participants show evidence of an increase in self-reported mindfulness over the course of the intervention?

    The Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer, & Smith, 2011; see Appendix J) was administered to participants at both pre- and postintervention phases. Daily mindfulness practice logs were also collected from adolescent participants, including date and minutes of mindfulness practiced. Parents were asked to corroborate all practice logs, verifying data regarding their child's daily practice.

CHAPTER 2

METHODS

Participant Recruitment

The current dissertation study was approved by the University of Utah Institutional Review Board (IRB) on 02/28/2016 (IRB#00089613). Following IRB approval, participants were recruited from the Intermountain West. Flyers with information about the study and the 9-week group, titled "Mindful Moments for Teens: Living with Stress in a Hectic World" (see Appendix A), were first posted at identified university outpatient clinics that served children and adolescents with disabilities, including ASD. In addition to advertising through outpatient university clinics, flyers were also posted at local, relevant agencies, such as parent support and advocacy centers and local schools for youth with autism. Information was additionally sent through a professional psychology email listserve, encouraging professionals to share group information. Families that expressed interest in the study and responded to the inquiry were contacted by telephone and asked to complete a screening interview designed to determine if the adolescent met screening criteria (see Appendix K for screening script; adapted from Haygeman, 2015).

Inclusion Criteria

In order to be included in the study, participants had to meet the following criteria: 1) be between the ages of 11 years, 6 months and 17 years of age by the start of the study; 2) have a documented diagnosis of autism (i.e., *DSM-5* diagnosis of ASD; or DSM-IV diagnosis of Asperger's Syndrome, Autistic Disorder, or Pervasive Developmental Disorder – Not Otherwise Specified [PDD-NOS]; or ICD-9 or -10 diagnosis of Autistic Disorder); and 3) have no evidence of intellectual disability (ID), as per parent report (i.e., the child did not have any previous diagnosis of ID and no special education services were being provided under this or any other educational classification that denoted significant ID). Further, potential participants were excluded from the study if they had previously participated in, or were currently participating in, a mindfulness-based group intervention.

Participant Demographics

In total, 29 parents and caregivers responded to the flyer. Of the 29 potential participants, 23 met inclusion criteria; however, only 14 parent and adolescent dyads consented to participation in the study. After the start of the intervention, four participants withdrew from the study, resulting in a total of 10 active study participants. For the purposes of this study, participants were referred to as Participants 1 through 10. Pertinent participant demographics were obtained from parents at the start of the study by means of the Demographic and Background Questionnaire (see Appendix L; adapted from Haygeman, 2015). Participant specifics, regarding age, sex, race, and diagnoses, are presented in Table 1.

Table 1

Participant Demographics

	Age	Sex	Race	Diagnoses
1	14-1	M	White	Asperger's Syndrome, ADHD, Anxiety
2	16-2	M	White	PDD-NOS, ADHD, OCD, Anxiety
3	14-1	M	Multi-Racial (Hispanic/Arab)	Asperger's Syndrome
4	16-3	M	White	ASD, ADHD, Anxiety, Mood Disorder-NOS, RAD, FAE, ODD
5	15-10	F	White	ASD, Anxiety
6	11-9	M	Multi-Racial (White/Asian American)	Asperger's Syndrome
7	14-3	M	Multi-Racial (White/Hispanic)	ASD, ADHD
8	14-8	M	White	ASD, Anxiety
9	16-11	M	White	ASD, ADHD, Mood Disorder-NOS
10	14-10	M	White	ASD, ADHD, Anxiety

Note. ADHD = Attention-Deficit/Hyperactivity Disorder, PDD-NOS = Pervasive Developmental Disorder – Not Otherwise Specified, OCD = Obsessive Compulsive Disorder, ASD = Autism Spectrum Disorder, RAD = Reactive Attachment Disorder, FAE = Fetal Alcohol Effects, ODD = Oppositional Defiant Disorder.

Participants were randomly assigned to groups as follows: group one (Participants 1-4), group two (Participants 5 and 6), and group three (Participants 7-10). Notably, group two was comprised of the 1) youngest child and 2) the only female participant. Descriptive analyses indicate that the average participant age was 14 years, 10 months (M = 14.875, SD = 17.84). The sample was largely homogenous in terms of sex, with 9 out of 10 of participants identifying as male. Seven participants were White and three

participants were multiracial. All parents reported that their adolescent had an autism diagnosis, including ASD, Asperger's Syndrome, and PDD-NOS. Eight out of 10 of the participants also had at least one comorbid diagnosis, the most common being Attention-Deficit/Hyperactivity Disorder (ADHD). None of the participants were diagnosed with ID. At the time of the study, 7 out of 10 of the participants were enrolled in additional services, including individual therapy, behavioral therapy, mentoring, and social skills programs, and were also taking prescribed medication. Based on parent report, all adolescents were treatment-naïve to mindfulness techniques. Five parents similarly reported having no prior knowledge of mindfulness practice and techniques, while the remaining five parents reported being somewhat familiar to familiar with mindfulness practice themselves. Parents indicated that they learned about mindfulness in various ways, including news articles, television, counselors/therapists, mindfulness groups, yoga, friends, and work in-services.

Setting

The study was conducted at a university outpatient clinic in the Intermountain West that serves children, adolescents, adults, and families affected by autism. Services offered at the clinic include the following: ASD assessments; social skills groups; individual and family therapy; school and psychiatric consultations; behavior management; and early intervention services. The clinic also conducts ongoing research to better understand ASD and corresponding evidence-based treatments and practices.

Procedures

At preintervention meetings, documents outlining parent information (Appendix M; adapted from Haygeman, 2015) and participant expectations (Appendix N; adapted from Haygeman, 2015) were disseminated and reviewed by the principal investigator (PI), allowing time for questions and discussion. Following the review, parental consent and adolescent assent for group participation in the research study were obtained. Additionally, parents were asked to complete the Anxiety Scale for Children – Autism Spectrum Disorder – Parent Version (ASC-ASD-P; Rodgers et al., 2015) and the study-developed Rigidity Rating Scale (see Appendix I). While parents completed questionnaires, adolescents were asked to complete the Anxiety Scale for Children – Autism Spectrum Disorder – Child Version (ASC-ASD; Rodgers et al., 2015), the Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer, & Smith, 2011; see Appendix J), and the study-developed Rigidity Rating Scale (see Appendix H). The same measures were administered to both parents and adolescents following the treatment phase. A research assistant was available at all time points to assist with reading measures and answering questions.

Baseline data were collected from adolescent participants regarding daily anxiety levels (see Appendix F) and daily amount of mindfulness practice. Participants continued to complete these daily ratings/logs throughout the intervention phase. Parents corroborated all practice log data and provided the data to the PI either through text, email, or paper logs. A weekly anxiety rating scale (see Appendix G; adapted from Haygeman, 2015) was also administered to participants at the beginning of each group session. Attendance was taken weekly to examine group participation and retention.

Finally, the Children's Intervention Rating Profile (CIRP; Witt & Elliott, 1985; see Appendix D) and the Behavior Intervention Rating Scale (BIRS; Elliott & Von Brock Treuting, 1991; see Appendix E) were administered to adolescent participants and parents after the final group to gather information regarding treatment acceptability. All group sessions were video recorded and reviewed for treatment integrity. Figures 1 and 2 illustrate data collection procedures.

Nine-Week Adapted *Mindful Schools* Intervention

The present intervention program was derived from the *Mindful Schools* Adolescent (or Middle – High School) Curriculum (Mindful Schools, 2015). The Adolescent Curriculum was adapted, with permission from *Mindful Schools*, for implementation over a 9-week period in an outpatient clinical setting. The original *Mindful Schools* Adolescent Curriculum (Mindful Schools, 2015) consists of 18 short, 15-minute lessons designed for weekly use in a school setting. The present adaptation incorporated two lessons from the original program into each week's after-school, 1½-hour lesson at an outpatient clinic. The *Mindful Schools* curriculum includes the following components: (a) didactic material related to mindfulness practice, (b) experiential practice of mindfulness practices, and finally, (c) journaling and group discussion about the practice. The present adaptation is outlined in Table 2, with key topics of each *Mindful Schools* lesson described.

In addition to the longer 1½-hour format and combination of two lessons per group, the following adaptions/additions were also made: (1) a beginning check-in, during which participants completed weekly anxiety scales and had a chance to

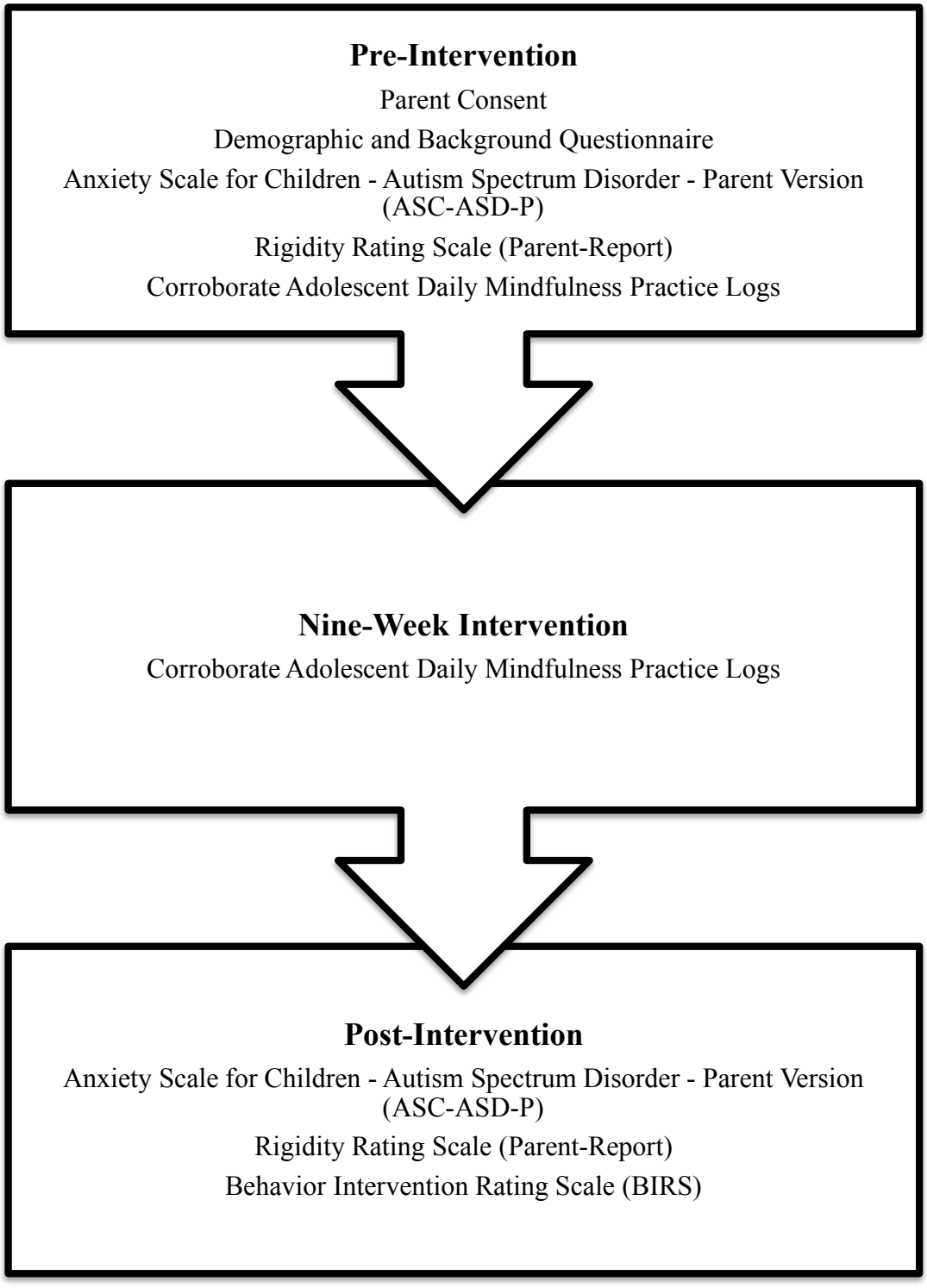

Figure 1. Parent-Report Data Collection Timeline

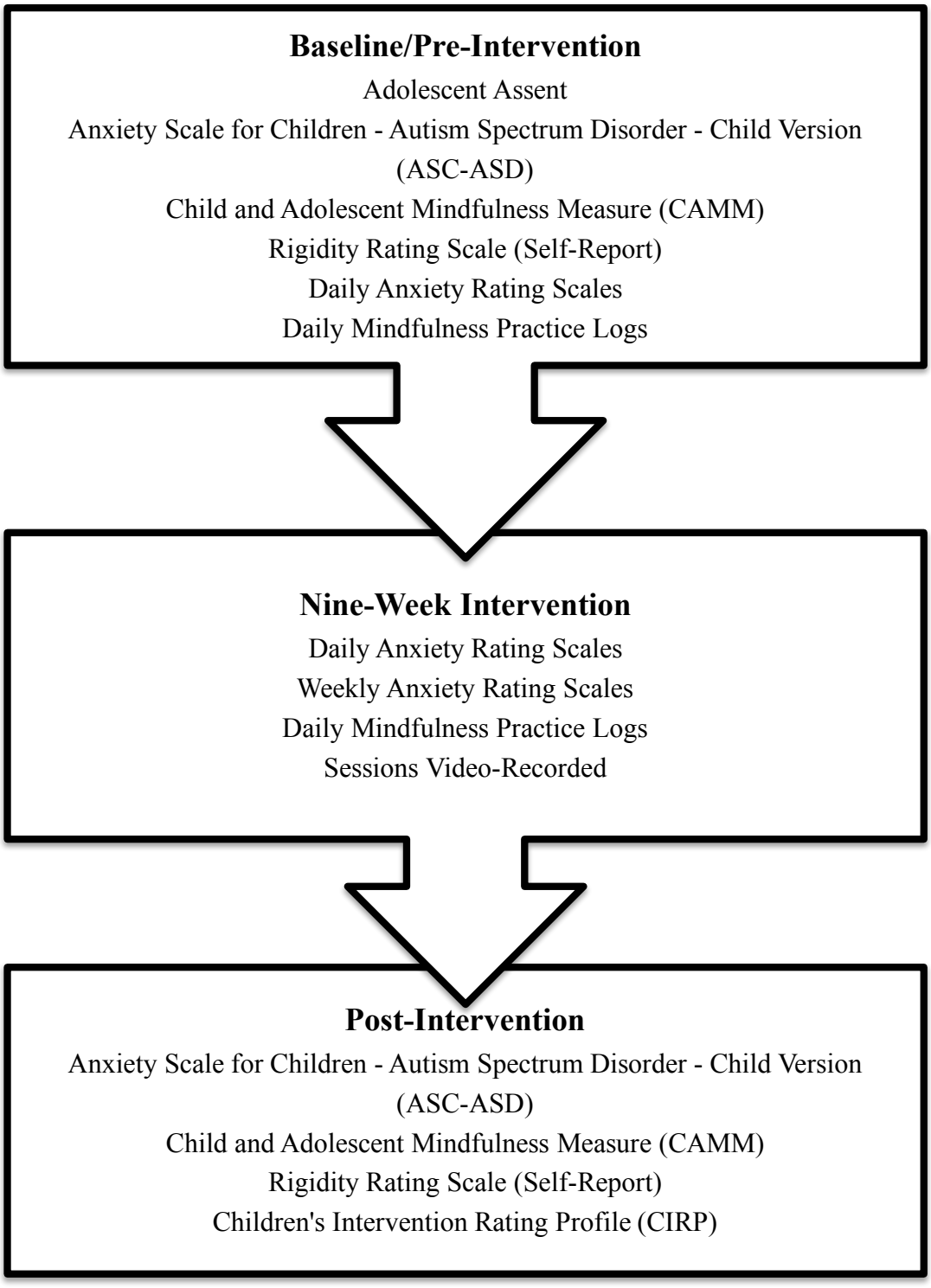

Figure 2. Adolescent-Report Data Collection Timeline

Table 2

Overview of the "Mindful Moments for Teens" Class

Session	Key Topics	Corresponding *Mindful Schools* Lesson
Week 1	• Introduction to mindfulness, techniques, and posture • Discussion about experiencing feelings and emotions • Practice focused awareness on sound • Discussion of reacting and responding • Practice awareness of breath	Introduction/ Lesson 1 Lesson 2
Week 2	• Develop rationale and motivation for mindfulness practice • Practice heartfulness • Thought labeling practice	Lesson 3 Lesson 4
Week 3	• Become familiar with our emotions through mindfulness • Awareness of breath practice with counting • Imagine how you would feel and react in different situations • More thought labeling practice	Lesson 5 Lesson 6
Week 4	• Mindful eating practice • Discussion of our connection to others around us • Practice heartfulness	Lesson 7 Lesson 8
Week 5	• Labeling thoughts practice with time reference • Guided meditation • ABC Technique (Levitt, 2015)	Lesson 9 Lesson 10
Week 6	• Welcoming all emotions • Body scan practice • Heartfulness practice in everyday life	Lesson 11 Lesson 12
Week 7	• Discussion about judgment and acknowledgement • Body awareness practice • Mindful walking	Lesson 13 Lesson 14

Table 2 continued

Session	Key Topics	Corresponding *Mindful Schools* Lesson
Week 8	• Heartfulness practice for oneself • Discussion of life moments • Practice mindfulness of emotions	Lesson 15 Lesson 16
Week 9	• Being mindful in conversation • Gratitude and appreciation • Closing thoughts and questions/suggestions for maintaining a mindfulness practice	Lesson 17 Lesson 18

share a brief highlight of their week, (2) a review of the previous week's lessons to encourage maintenance of techniques, (3) a 10-min break and snack time in between the two group lessons to allow for socialization amongst group participants, and (4) a wrap-up discussion, including review of the day's lessons and homework expectations. During the last group session, all curriculum techniques were reviewed and participants were encouraged to note these techniques on an available review sheet.

The PI further incorporated the "ABC Technique," developed by Dr. Olin Levitt (2015), during week 5. This technique combines mindful breathing, mindful movement, and a cognitive approach (Levitt, 2015; see Appendix O). The ABC Technique (Levitt, 2015) was integrated into the week 5 curriculum to build on discussion of mindful breathing and present-moment awareness. The technique, designed by Dr. Levitt (2015) to be used in times of worry or stress, consists of the following three components. First, "A" represents "a mindful breath," encouraging the participant to direct their attention to one full breath. Second, "B" represents "both words and tapping," or a centering technique during which a participant grounds his or her thumbs on his or her legs or another surface, leaving the other four fingers free. As a participant "taps" his or her four free fingers, a positive four-syllable phrase, such as "I can be here," is silently recited. Third and finally, "C" represents "choose wisely," encouraging a participant to make a wise choice that benefits not only oneself, but others (Levitt, 2015). The addition of this technique allowed for a concrete, readily available technique for adolescents to use in times of stress or worry, ultimately encouraging active focusing of attention and present-moment awareness.

Participants were further encouraged to commit to 10 min of daily mindfulness

practice at home as homework. Participants were reinforced for taking the time to complete homework and practice mindfulness. Each week during group, one ticket was placed into a drawing for every 10 min of mindfulness that a participant practiced. Participants did not earn a drawing ticket unless parents agreed with their report. The drawing, including tickets from all group participants, was completed at the beginning of each weekly session. Prizes for the drawing were small and included such things as candy, soda, *Red Box* promo codes, and *Magic the Gathering* cards. During three out of the nine randomly selected sessions per group, all participants earned reinforcement regardless of minutes practiced.

Participants were also reinforced for group attendance. Specifically, participants were given one ticket per each week that they attended the group (i.e., a maximum of nine tickets per participant). The attendance drawing took place at the end of each group. The prize was a $50 Visa gift card to be used at a place of the winning participant's choosing. In total, three randomly-selected participants (one from each group) received a $50 Visa gift card as a reward for participation following the attendance ticket drawing.

Group Leader Training

The PI of this study served as the group leader for the "Mindful Moments for Teens" group. As suggested by the *Mindful Schools* training staff and others in the field (Kabat-Zinn, 2003), the PI had training in mindfulness and also personally practiced mindfulness on a regular basis. At the time of the study, the PI was a school psychology, doctoral-level student with 10 months of experience as a school psychology intern in a public school for children with severe cognitive, behavioral, developmental, and/or

physical disabilities. The PI also completed both the *Mindful Schools* fundamentals course and curriculum training, and further received permission to conduct the current research from the *Mindful Schools* organization. A graduate student research assistant (RA) assisted with data collection, and, with parent and adolescent permission, observed sessions in group three.

Dependent Variables

Feasibility Dependent Variables

Participant Enrollment and Retention

Initially, the PI tracked recruitment responses on a secure, encrypted spreadsheet. After obtaining of consent and assent, participant enrollment and attendance were continuously tracked on a study-developed spreadsheet (see Appendix B for an example) and kept in a separate, secure location by the PI. For the purposes of this study, group completion was defined as completing a minimum of seven of the nine group sessions.

Treatment Integrity

All of the "Mindful Moments for Teens" groups were video-recorded to allow for coding of treatment integrity. Video recordings were kept in an encrypted, secure location. A treatment integrity checklist (see Appendix C; adapted from Haygeman, 2015) was used in order to determine if all components of the intervention were implemented. The PI and a trained graduate student RA observed 33% of the video recordings (i.e., three out of nine for each group) and completed the checklist. Interobserver agreement was calculated based on the completed checklists. Agreement

needed to be at or above 85% to be deemed acceptable. Further, qualitative data (i.e., notes and comments from treatment integrity checklists) were analyzed to determine specific factors that interfered with the planned treatment.

RA training took place prior to treatment integrity observations. Specifically, the PI walked through the curriculum with the RA and discussed program components. The PI and RA both viewed *Mindful Schools* course implementation videos (during curriculum trainings) in order to ensure that curriculum components and lesson structure were clearly understood.

Adolescent Participant and Parent Satisfaction

The Children's Intervention Rating Profile (CIRP; Witt & Elliott, 1985; see Appendix D) was used in order to assess adolescent participant satisfaction with the "Mindful Moments for Teens" intervention. The CIRP is an instrument that assesses children's perceptions of treatment fairness and effectiveness. The scale is written at a fifth-grade reading level and consists of seven separate Likert-scale items ranging from "I do not agree" (1) to "I agree" (6), including three reverse-scored items (i.e., items 2, 3, and 4). Higher scores indicate greater acceptability. Internal consistency coefficients for the CIRP range from .75 to .89, and validity evidence suggests that the CIRP accurately discriminates between interventions (Finn & Sladeczek, 2001).

The Behavior Intervention Rating Scale (BIRS; Elliott & Von Brock Treuting, 1991; see Appendix E) was administered to parents to assess satisfaction with the "Mindful Moments for Teens" intervention. The BIRS was derived from the Intervention Rating Profile (IRP-15) and consists of 24 items rated on a six-point Likert scale that

ranges from “strongly disagree” (1) to “strongly agree” (6). Higher scores are indicative of greater treatment acceptability. The measure has excellent internal consistency (coefficient α = .97; Finn & Saldeczek, 2001).

Supplemental Dependent Variables

Anxiety Symptomatology

Anxiety was examined using both self- and parent-report versions of the Anxiety Scale for Children – Autism Spectrum Disorder (ASC-ASD; Rodgers et al., 2015; see http://research.ncl.ac.uk/cargo-ne/ASC.html for free download and reference). The ASC-ASD is a multirater measure that assesses anxiety symptoms in youth, ages 8-16, diagnosed with ASD. The ASC-ASD was derived from the Revised Children’s Anxiety and Depression Scale (RCADS; Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000), which is a well-validated measure of anxiety used with typically developing children. Both self- and parent-report versions of the ASC-ASD consist of 24 items, and include the following scales: separation anxiety (SA), performance anxiety (PA), uncertainty (U), and anxious arousal (AA). Items are rated on a four-point Likert scale ranging from “never” (0) to “always (3). Responses result in a subscale score for each of the above-listed scales as well as a total score. The highest possible scores across scales are as follows: performance anxiety (15), anxious arousal (18), separation anxiety (15), uncertainty (24), and total score (72). Higher scores are indicative of greater anxiety symptomatology; however, indicative clinical cut-off scores have yet to be established (Rodgers et al., 2016). Preliminary evidence of scale development indicates good internal consistency (Cronbach’s α = .94 for both parent and child versions) and test-retest

reliability (parent: $r = .84$; child: $r = .82$). The ASC-ASD also strongly correlated with the Screen for Child Anxiety Related Disorders (SCARED; parent: $rs = .91$, $p = .000$; child: $rs = .88$, $p = .000$), suggesting that the ASC-ASD is in fact a valid measure of anxious affect (Rodgers et al., 2016). Again, the ASC-ASD scales (Rodgers et al., 2015) are available for download for free at: http://research.ncl.ac.uk/cargo-ne/ASC.html.

Anxiety was further examined using a study-developed weekly anxiety rating scale (see Appendix G; adapted from Haygeman, 2015). The weekly anxiety rating scale required participants to rate the severity of their anxiety on a 0 to 10 scale for overall anxiety during the previous week. The scale addressed peer interactions, as well as situations that took place in school, at home, and in the community.

Additionally, on a nightly basis, participants were asked to complete the study-developed daily anxiety rating scale (see Appendix F). A specific time for nightly data collection was not set. Data regarding daily anxiety severity level were collected at baseline and throughout the intervention phase. Similar to the weekly rating scale, the daily anxiety rating scale required participants to rate the severity of their anxiety for that day only, on a scale of 0 to 10. Parents of participants made this information available to the PI in the most convenient way for them; for example, through text and email.

Rigidity

Rigidity was measured using a study-developed, multirater Rigidity Rating Scale (see Appendices H and I). Both self- and parent-report versions consisted of 10 Likert-scale items ranging from “strongly disagree” (1) to “strongly agree” (7). The parent version also included an optional section in which parents could list specific observed

behaviors and rate them on a severity scale ranging from "not severe" (1) to "very severe" (7). The 10 scale items for each version were drawn from the *DSM-5 (*American Psychiatric Association, 2013) Autism Spectrum Disorder diagnostic criteria; the Social Responsiveness Scale (2nd ed.; SRS-2) School-Age Form (Constantino & Gruber, 2012); the Repetitive Behavior Questionnaire – Second Edition (RBQ-2; Leekam et al., 2007); and the Behavior Rating Inventory of Executive Functions (BRIEF; Gioia & Isquith, 2013; Blijd-Hoogewys, Bezemer, & van Geert, 2014). Items were adapted from the *DSM-5* criteria and the listed rating scales to assess behaviors that are often observed when adolescents with ASD are anxious, such as an increase in inflexible thinking, distress over small changes, and difficulty with transitions and newness (American Psychiatric Association, 2013; Lang et al., 2015; Wingham et al., 2015). The Rigidity Rating Scale was developed to provide information from both parents and adolescents about inflexible or rigid behaviors. Higher scores were associated with greater magnitude of rigidity.

Mindfulness

Mindfulness of participants was examined using the Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer, & Smith, 2011; see Appendix J). The CAMM is a measure of mindfulness that examines the degree to which respondents observe internal experiences, act with awareness, and accept experiences without judgment. The CAMM was primarily developed to address the dearth of mindfulness measures available for children and adolescents. The CAMM has a single factor structure and includes 10 items that are reverse-scored (higher scores correspond to higher levels

of mindfulness). The CAMM has adequate internal consistency (Cronbach's $\alpha = .80$). Validity analyses indicate that scores on the CAMM are positively correlated with favorable outcomes, such as academic competence and quality of life, and negatively correlated with adverse outcomes, such as internalizing and externalizing symptoms (Greco, Baer, & Smith, 2011).

Participants were also required to practice mindfulness for a minimum of 10 min daily as homework. Baseline data were collected regarding practice time prior to intervention. During intervention, participants provided practice data through daily mindfulness practice logs or by means of parent text or email. Parents were asked to corroborate all participant data regarding minutes of mindfulness practiced.

Design and Data Analyses

A single-subject, multiple-baseline design across three groups was used in this study to assess the feasibility and effectiveness of the "Mindful Moments for Teens" intervention. Each group was introduced to the intervention in a temporal sequence (i.e., 2 weeks apart).

Feasibility Data Analysis

Descriptive statistics were first utilized to examine participant retention and group completion. Next, session integrity percentages were calculated for 33% of all intervention sessions (i.e., three out of nine randomly selected sessions per group) by both the PI and RA, utilizing the treatment integrity checklist (see Appendix C; adapted from Haygeman, 2015). Percent of interobserver agreement was then calculated by taking

the number of rater agreements and dividing by the total number of rater agreements plus disagreements. Cohen's Kappa was further calculated, which corrects for chance agreement. The formula for Cohen's Kappa is as follows: $k = (Po - Pc) / (1 - Pc)$, where Po = the percent of agreement, and Pc = chance agreement (Watkins & Pacheco, 2000). Third, in order to examine treatment acceptability, descriptive statistics and one-way analysis of variance (ANOVA) tests were calculated based on results from the adolescent-completed CIRP (Witt & Elliott, 1985; see Appendix D) and the parent-completed BIRS (Elliott & Von Brock Treuting, 1991; see Appendix E).

Supplemental Data Analysis

Descriptive statistics and change scores were calculated for the overall composites and subscales on the ASC-ASD (self- and parent-report; Rodgers et al., 2015), Rigidity Rating Scale (self- and parent-report; see Appendices H and I), and the CAMM (Greco, Baer, & Smith, 2011; see Appendix J). Visual analyses, including level, trend, and variability, and Tau-U were calculated to examine data from daily anxiety reports (see Appendix F). Specifically, Tau-U (Parker, Vannest, Davis, & Sauber, 2011) is a nonoverlap technique that controls and adjusts for phase trend, making it a modest predictor of effect size. Tau-U may be calculated by hand or by means of the free, online calculator available at www.singlecaseresearch.org. Finally, weekly anxiety scale reports (see Appendix G; adapted from Haygeman, 2015) and time spent practicing mindfulness were analyzed using descriptive statistics.

CHAPTER 3

RESULTS

The following results are described in terms of intervention feasibility, including participant retention and group completion, treatment integrity, and treatment acceptability, as well as effectiveness of the intervention on adolescent anxiety, rigidity, and mindfulness. Specifically, questions one through three will address intervention feasibility, while questions four through six will address intervention effectiveness.

Intervention Feasibility

Results of Research Question #1

- Did participants regularly attend and remain in the "Mindful Moments for Teens" group throughout the intervention?

In total, 14 adolescents and their parents consented to participation in the study. Nine of the 14 participants (64.3%) regularly attended (i.e., attended seven or more sessions) and completed the "Mindful Moments for Teens" group. More specifically, five attended all nine sessions (35.7%), three attended eight sessions (21.4%), and one attended seven sessions (7.1%). One participant (7.1%) completed a total of six sessions, missing three group sessions, including the last session, due to extracurricular school activities. Still, pre- and posttreatment data were obtained for this participant. Four

participants (28.6%) stopped attending and/or withdrew from the study for the following reasons: (1) one participant consented to group participation, but failed to attend sessions or respond to future group correspondence, (2) a second participant attended the first group session, but failed to attend future sessions or respond to group correspondence, (3) a third participant attended a total of three sessions, ultimately withdrawing from the study due to high levels of anxiety in group settings and the desire to pursue individual treatment, and (4) a final participant attended three total sessions before withdrawing due to expressed lack of interest and limited participation during group sessions. Despite participant attrition, the majority of participants regularly attended and completed the mindfulness group.

Results of Research Question #2

- Did the "Mindful Moments for Teens" group leader adhere to the treatment protocol, and were all of the lessons conducted as planned?

The PI and a trained RA observed 33% of the video recordings (nine total videos; three videos from each group) and independently completed the treatment integrity checklist (see Appendix C; adapted from Haygeman, 2015). One hundred percent treatment adherence was expected, given that lessons were manualized and clearly described. Ratings from the PI and RA indicated an average of 97.62% (*SD* = 1.12) treatment adherence across sessions (see Table 3 for treatment integrity percentages by observed session).

Specifically, the PI concluded that the nine randomly selected sessions were implemented with 96.82% integrity, as the review of homework expectations was

Table 3

Treatment Integrity by Session and Interobserver Agreement

Session	PI	RA	*IOA*
1	100.00	100.00	100.00
2	100.00	100.00	100.00
3	100.00	100.00	100.00
4	100.00	100.00	100.00
5	100.00	100.00	100.00
6	85.71	100.00	85.71
7	100.00	100.00	100.00
8	85.71	85.71	100.00
9	100.00	100.00	100.00

Note. PI = principal investigator, RA = research assistant, IOA = interobserver agreement

missing across two out of the nine sessions (i.e., sessions six and eight). In comparison, the RA found that the homework review was neglected only during session eight, resulting in an overall treatment integrity percentage of 98.41%. Independent observations between the PI and RA resulted in an overall interobserver agreement (IOA) of 98.41%, suggesting 'substantial' agreement (k = .65).

Qualitative comments across both observers indicated that one lesson activity had to be modified due to an adolescent's unwillingness to participate. Specifically, during the mindful conversation activity (week 9/lesson 17), one participant pretended to fall asleep. The participant expressed to the PI that he did not want to speak with someone in pairs (as outlined in the curriculum). As such, the PI modified the activity to have one

participant speak to the group at a time, followed by each participant making a mindful comment about what the speaker had said. This continued until everyone had a chance to speak. Both observers agreed that all other observed curriculum components were implemented without modification.

Results of Research Question #3

- Was the present adaptation of the *Mindful Schools* curriculum acceptable to the participants?

Adolescent Participant Satisfaction

After the final treatment session, all 10 adolescent participants completed the CIRP (Witt & Elliott, 1985; see Appendix D). Overall, adolescents rated the group as being highly favorable ($M = 5.11$, $SD = 1.32$). Table 4 shows mean responses to the CIRP, by item. Participant responses to item four on the CIRP differed significantly across the three groups (F (2, 7) = 12.40, $p = .005$). Specifically, participants in group two reported strong levels of agreement with item four ($M = 5.50$, $SD = 0.71$), indicating that these two participants believed that there might be a better method available to handle stress and anxiety. No other statistically significant differences were found among the remaining questions.

All participant responses to item two (across groups) were the same ($M = 1.00$, $SD = 0.00$), highlighting overall satisfaction with the group leader. Moreover, participants reported high levels of agreement with items six ($M = 5.20$, $SD = 1.32$) and seven ($M = 5.20$, $SD = 1.23$), suggesting that, in general, participants liked the

Table 4

Means and Standard Deviations of CIRP Items by Group and Across All Participants

Item	Group 1[a]	Group 2[b]	Group 3[c]	N = 10
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
1. The method used to deal with my stress and anxiety was fair.	4.50 (1.29)	3.00 (0.00)	5.00 (1.41)	4.40 (1.35)
2. The teacher was too harsh on me.	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)
3. The method used to deal with my stress and anxiety may cause problems with my friends.	1.50 (1.00)	1.00 (0.00)	1.75 (0.50)	1.50 (0.71)
4. There are better ways to handle stress and anxiety than the one used.	2.25 (1.26)	5.50 (0.71)	1.50 (0.58)	2.60 (1.78)
5. The method used by this teacher would be a good one to use with other children.	4.00 (2.16)	5.50 (0.71)	6.00 (0.00)	5.10 (1.56)
6. I like the method used to deal with my stress and anxiety.	5.25 (0.96)	4.00 (2.83)	5.75 (0.50)	5.20 (1.32)
7. I think the method for stress and anxiety will help me do better in school.	5.00 (1.41)	5.50 (0.71)	5.25 (1.50)	5.20 (1.23)

Note. Scale of 1-6 (1 = I do not agree; 6 = I agree). Items 2, 3, and 4 are reversed scored. [a]Group 1 (n = 4). [b]Group 2 (n = 2). [c]Group 3 (n = 4)

mindfulness intervention and believed that skills learned would help them do better in school.

Adolescent participants were also given the option to write additional comments regarding the intervention group and methods used. A total of 6 out of 10 (60%) participants left qualitative remarks on the CIRP (see Table 5 for a complete list). Overall, remarks on the adolescent-completed CIRP were positive and, most notably, suggested that future use of skills and concepts learned was likely for some.

Table 5

Social Validity Results From the Adolescent-Completed CIRP

Participant Written Responses
"I will yous [use] my methods to come [calm] down and make friends."
"I liked the class overall. There was very useful information."
"I like the group because we get to share things with each other that other people don't want to hear."
"Best teacher!!!"
"It was very useful and I'll still use the thing[s] I learned from the group."
"Thank you for all your help these past few weeks. Your information is very valuable."

No negative comments regarding the group were made by adolescent participants.

Parent Satisfaction

In addition to adolescent completion of the CIRP, parents completed the BIRS (Elliott & Von Brock Treuting, 1991; see Appendix E). Overall, parents rated the intervention as being slightly less favorable ($M = 4.66$, $SD = 1.25$) than adolescent participants, largely based on home observations and perception of adolescent response to treatment. Table 6 shows mean responses to the BIRS, by item.

Parent responses to item six ("most parents would find mindfulness suitable in targeting coping skills") differed significantly across the three groups (F (2, 7) = 6.30, p = .027). Specifically, parents of adolescents in group two reported strong levels of agreement with this statement ($M = 6.00$, $SD = 0.00$). Parents of adolescents in the remaining two groups responded with significantly lower levels of agreement ($M = 4.50$,

Table 6

Means and Standard Deviations of BIRS Item by Group and Across All Participants

Item	Group 1[a] Mean (SD)	Group 2[b] Mean (SD)	Group 3[c] Mean (SD)	N = 10 Mean (SD)
1. Mindfulness is an acceptable intervention to improve coping skills.	5.25 (0.50)	6.00 (0.00)	5.25 (0.96)	5.40 (.70)
2. Most parents would find this intervention appropriate for poor coping skills.	4.75 (1.26)	5.50 (0.71)	4.75 (0.50)	4.90 (0.88)
3. Mindfulness has proven effective in improving my child's coping skills.	4.25 (0.96)	3.00 (1.41)	5.50 (0.50)	5.30 (1.03)
4. I would suggest the use of this intervention to other parents.	4.75 (0.96)	6.00 (0.00)	5.50 (0.58)	5.30 (0.82)
5. Poor coping skills in my child are severe enough to warrant use of mindfulness.	5.50 (0.58)	5.50 (0.71)	5.00 (1.16)	5.30 (0.82)
6. Most parents would find mindfulness suitable in targeting coping skills.	4.50 (0.58)	6.00 (0.00)	4.50 (0.58)	4.80 (0.79)
7. I would be willing to use mindfulness in my home.	5.75 (0.50)	6.00 (0.00)	5.25 (1.50)	5.60 (0.97)
8. Mindfulness has not resulted in negative side effects for my child.	5.75 (0.50)	6.00 (0.00)	6.00 (0.00)	5.90 (0.32)
9. Mindfulness is an appropriate intervention for a variety of children.	5.50 (0.58)	6.00 (0.00)	5.75 (0.50)	5.70 (0.48)
10. Mindfulness is consistent with other coping skills programs I have used at home.	4.50 (0.58)	3.50 (0.71)	4.75 (0.96)	4.40 (0.84)
11. Mindfulness is a fair way to teach coping skills.	5.25 (0.96)	4.50 (0.71)	5.35 (0.96)	5.10 (0.88)
12. Mindfulness is reasonable for difficulties that arise from poor coping skills.	4.50 (1.29)	5.50 (0.71)	5.25 (0.96)	5.50 (1.05)
13. I like the procedures used in mindfulness.	5.75 (0.50)	5.50 (0.71)	5.25 (0.96)	5.50 (0.71)

Table 6 continued

Item	Group 1[a] Mean (SD)	Group 2[b] Mean (SD)	Group 3[c] Mean (SD)	N = 10 Mean (SD)
14. Mindfulness is a good way to handle coping skills at home.	5.00 (0.00)	6.00 (0.00)	5.00 (1.16)	5.20 (0.79)
15. Overall, mindfulness has been beneficial for my child.	5.50 (0.58)	4.50 (0.71)	5.25 (0.96)	5.20 (0.79)
16. Mindfulness quickly improves a child's behavior.	3.25 (1.71)	3.00 (1.41)	3.50 (1.29)	3.30 (1.34)
17. Mindfulness should produce a lasting improvement in a child's behavior.	4.25 (0.50)	2.50 (2.12)	5.25 (0.96)	4.30 (1.42)
18. Mindfulness improves a child's behavior to the point that it does not noticeably deviate from the other peer's behavior.	3.25 (1.50)	2.00 (1.41)	4.50 (1.00)	3.50 (1.51)
19. Soon after using mindfulness, parents noticed a positive change in coping skills.	4.00 (1.16)	2.50 (0.71)	4.00 (0.82)	3.70 (1.06)
20. The child's behavior will remain at an improved level even after the mindfulness group is discontinued.	3.75 (2.22)	3.50 (0.71)	4.75 (0.96)	4.10 (1.52)
21. Using mindfulness has not only improved the child's behavior in the home, but also in other settings (e.g. classrooms, playground, community).	3.75 (1.50)	5.50 (0.71)	4.75 (0.50)	4.50 (1.18)
22. When comparing a participant with a non-participant peer before and after the use of the mindfulness group, the participant's and the peer's behavior are more alike after using mindfulness.	3.25 (1.50)	3.50 (0.71)	4.25 (0.98)	3.70 (1.16)
23. Mindfulness has produced enough improvement in coping skills so the behavior no longer is a problem.	2.50 (1.29)	2.00 (0.00)	3.50 (1.29)	2.80 (1.23)
24. Other behaviors related to coping skills have improved by mindfulness.	4.25 (0.50)	4.00 (0.00)	4.75 (0.96)	4.40 (0.70)

Note. Scale of 1-6 (1 = strongly disagree, 6 = strongly agree). [a]Group 1 (n = 4). [b]Group 2 (n = 2). [c]Group 3 (n = 4).

SD = 0.58 for both groups one and three). Nevertheless, the level of agreement with item six was still moderate for groups one and three. Differences between groups on item seventeen ("mindfulness should produce a lasting improvement in a child's behavior") approached statistical significance (F (2, 7) = 4.42, p = .057). Notably, parents from group two reported lower levels of agreement with this statement (M = 2.50, SD = 2.12). Group two responses to item 17 suggest that lasting change was not expected following group completion. No other statistically significant differences were found among the remaining questions.

Parents reported the lowest level of agreement with item 23: mindfulness has produced enough improvement in coping skills so the behavior no longer is a problem (M = 2.80, SD = 1.23), suggesting that mindfulness had limited impact on adolescents' ability to cope with anxiety and rigidity. The highest-rated questions across groups were as follows: (8) mindfulness has not resulted in negative side effects for my child (M = 5.90, SD = 0.32); (9) mindfulness is an appropriate intervention for a variety of children (M = 5.70, SD = 0.48); and (7) I would be willing to use mindfulness in my home (M = 5.60, SD = 0.97). In general, these responses suggest that there were very limited to no negative side effects as a result of the intervention, and further highlight parents' willingness to implement mindfulness at home, as well as the potential utility of mindfulness across a variety of youth populations.

Parents were also given the option to write additional comments regarding the intervention group and methods used. A total of 8 out of 10 (80%) parents left qualitative remarks on the BIRS (see Table 7 for a complete list). Several parents expressed the desire for an increased number of adolescent participants in each group, written

Table 7

Social Validity Results From the Parent-Completed BIRS

Parent Written Responses
“Mindfulness has helped my child to deal with their anxiety at home and at school.”
“My child is already unwilling to use the skill when asked, unless there's a reward. They will not do it [mindfulness] at all when upset.”
"I think a more structured outline for parents on the lessons would help us reinforce skills that they learned at the sessions."
"I think it was a great group. I wished it [the group] had more kids. My child did not rate their anxiety as high as I think it was."
"Thank you - I can see improvements in my child. I would like to suggest that you make the parents participate with their child so we can practice together at home. If I had been in the classroom, I could have supported him more."
“This has been a positive experience. The group leader has been very easy to work with."
"Skills taught in the class reinforced methods I had been attempting to use previously."
"It would be helpful to have more info for parents of techniques used, maybe even written (so we don't forget and can remind kids)."

handouts/outlines of group sessions, and the opportunity to participate in the group alongside their child. More specifically, in final group sessions, parents suggested these adaptations in order to promote generalization and use of coping skills across settings. In written feedback, one parent noted specific concerns about sustained use of mindfulness techniques over time, highlighting that an extrinsic reward still appears to be needed for skill use for this participant.

Intervention Effectiveness

Results of Research Question #4

- Did participants show evidence of decreased anxiety over the course of the intervention?

Daily Anxiety Ratings

Individual participant daily anxiety ratings were averaged by group across phases (see Figure 3). Tau-U calculations for group averages suggest that group two evidenced the greatest average change in daily anxiety (Tau-U = -.26) from pre- to post-intervention, followed by group one (Tau-U = .25) and group three (Tau-U = -.13). Visual analyses of group graphs further suggest a lower level of anxiety after intervention for group one (*M1* = 3.42, *M2* = 3.11), group two (*M1* = 3.30, *M2* = 2.22), and group three (*M1* = 3.14, *M2* = 2.85). A decreasing trend or slope from baseline to intervention was also observed for all groups. Variability analyses indicated that group two ratings, on average, were the most variable during both baseline (*SD* = 2.37) and intervention (*SD* = 1.66), while group one exhibited the least variable responses, on average, across both baseline (*SD* = .76) and intervention (*SD* = .64).

Daily anxiety ratings from each individual participant are shown in Figures 4 to 13. Tau-U calculations (listed in Table 8) suggest limited to no overall intervention effect (Tau-U = -.09) on daily anxiety across all participants. More specifically, six of nine participants experienced a small decrease in daily anxiety symptomatology (with Tau-U calculations ranging from -.27 to -.39), while three experienced limited to no intervention effect on daily anxiety. Results for Participant 10 alone indicate a large positive effect

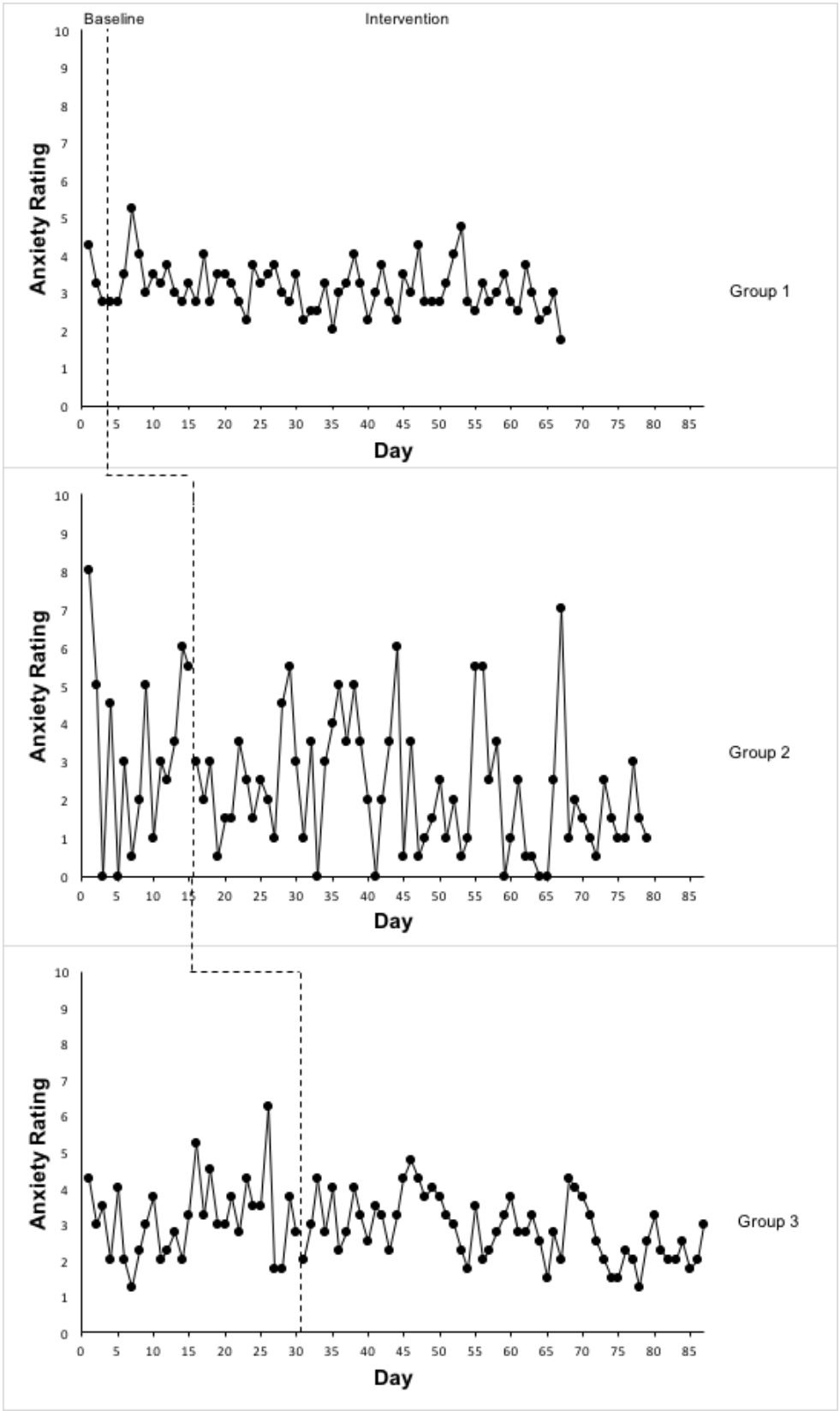

Figure 3. Group Average Daily Anxiety Ratings by Session and Across Phases

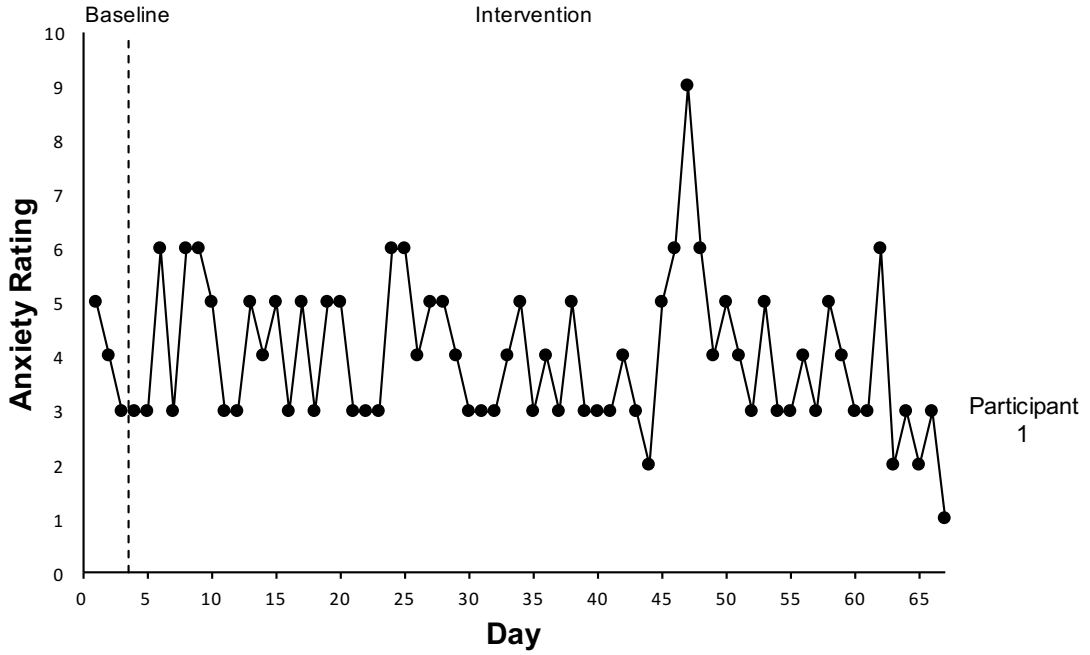

Figure 4. Daily Anxiety Ratings for Participant 1

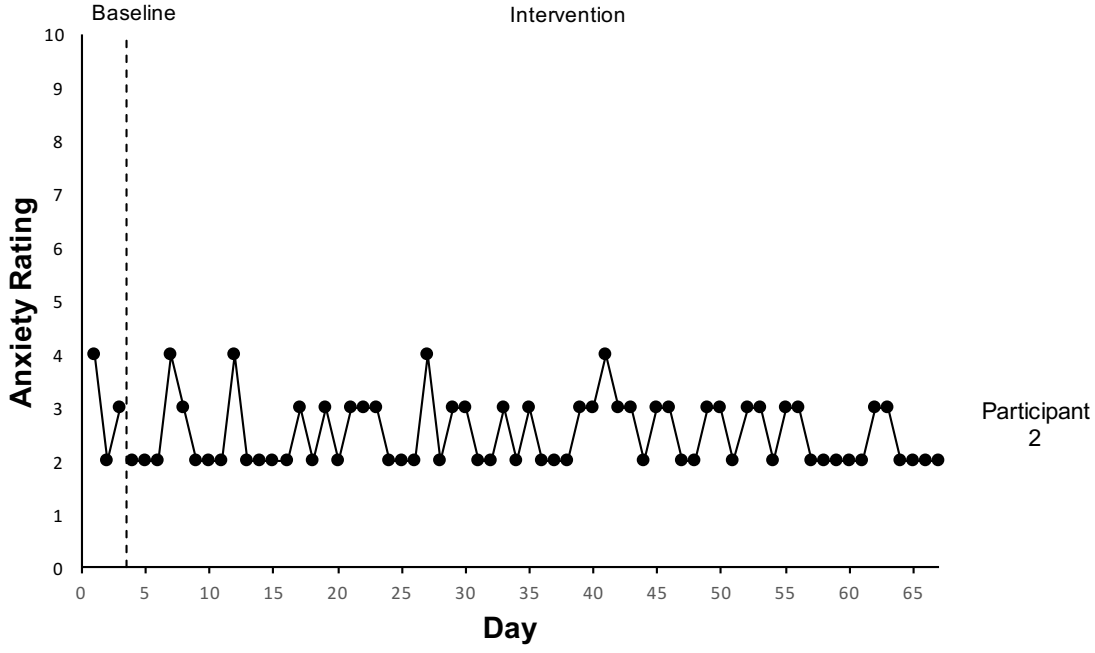

Figure 5. Daily Anxiety Ratings for Participant 2

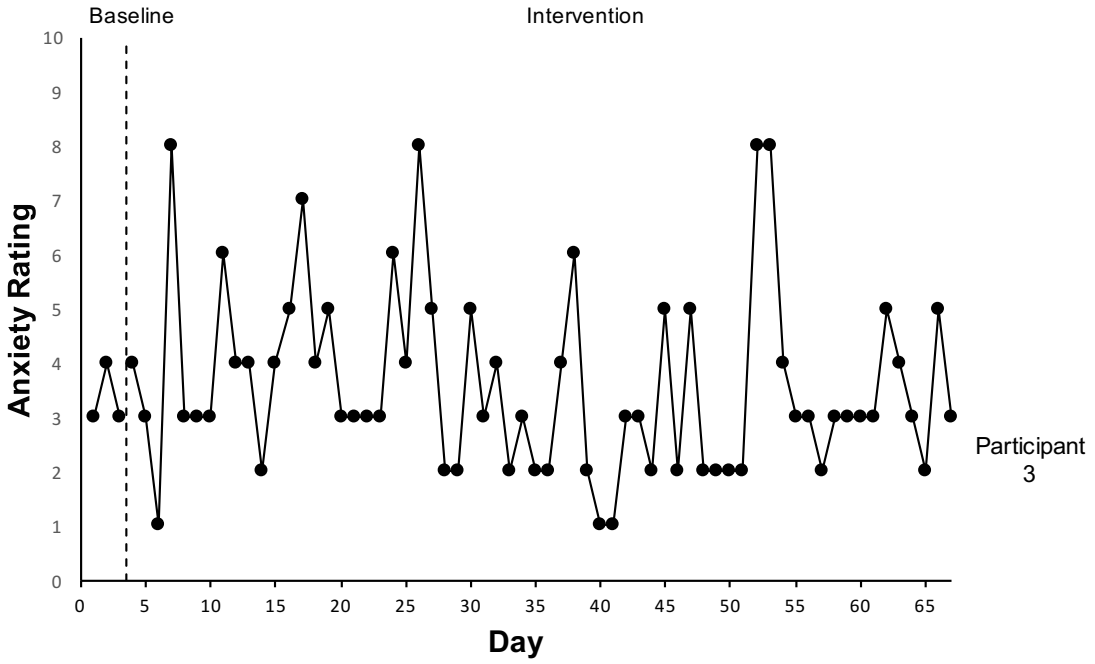

Figure 6. Daily Anxiety Ratings for Participant 3

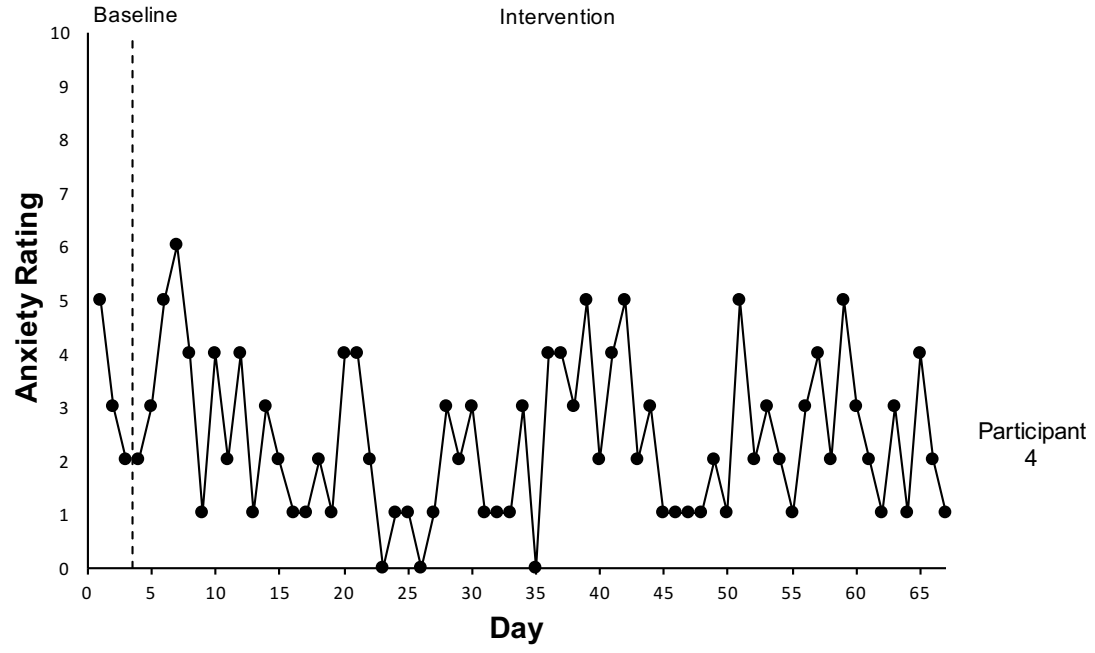

Figure 7. Daily Anxiety Ratings for Participant 4

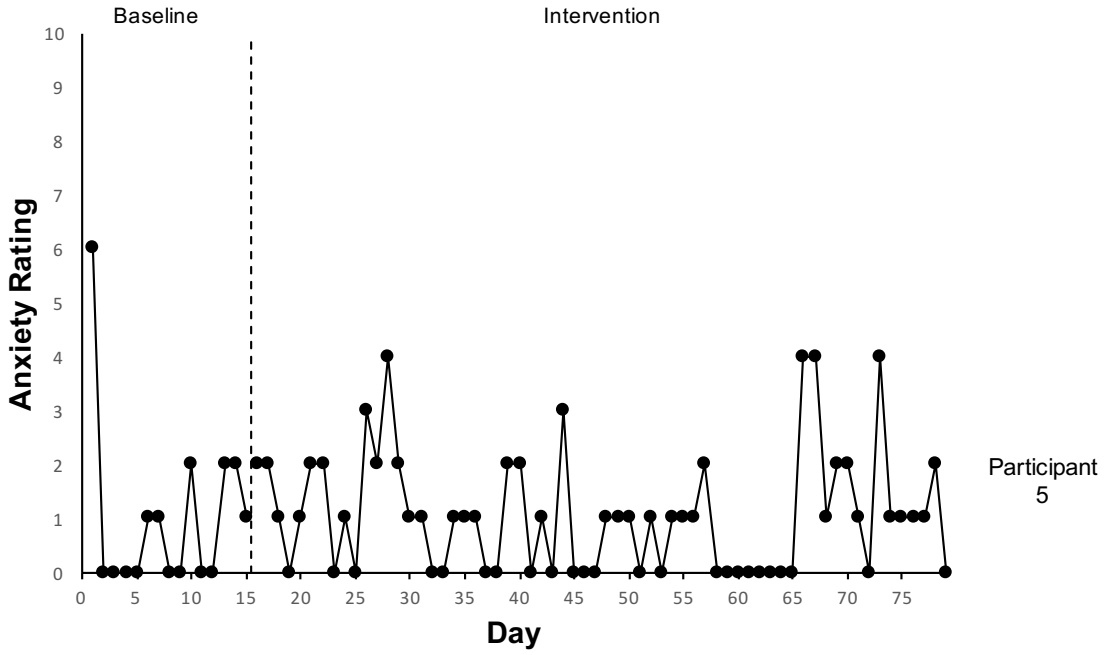

Figure 8. Daily Anxiety Ratings for Participant 5

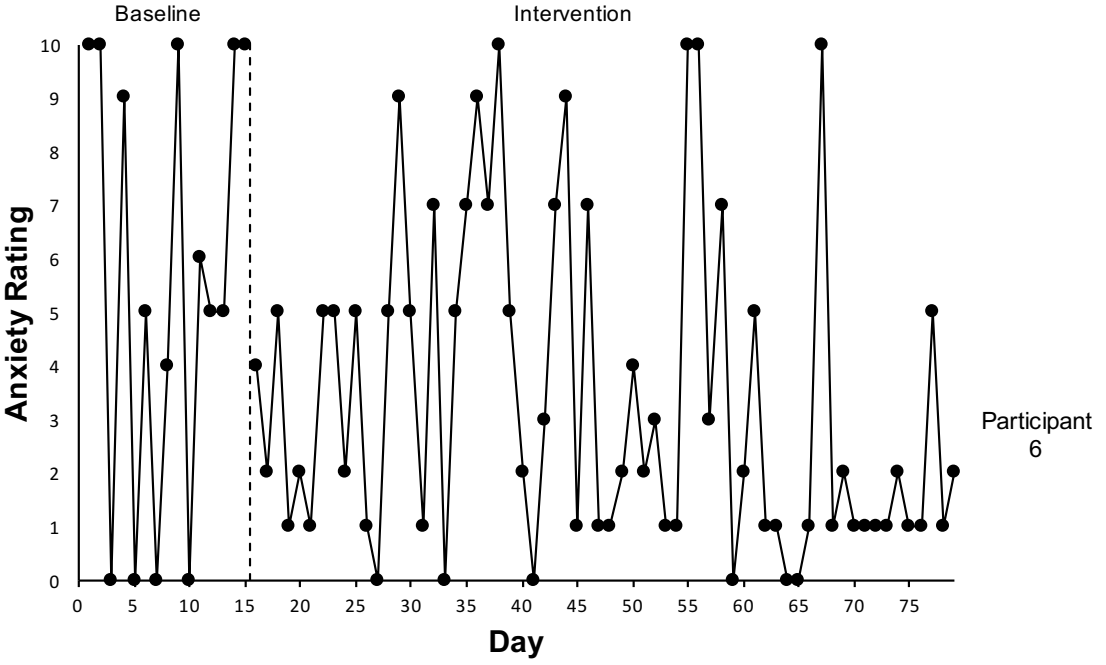

Figure 9. Daily Anxiety Ratings for Participant 6

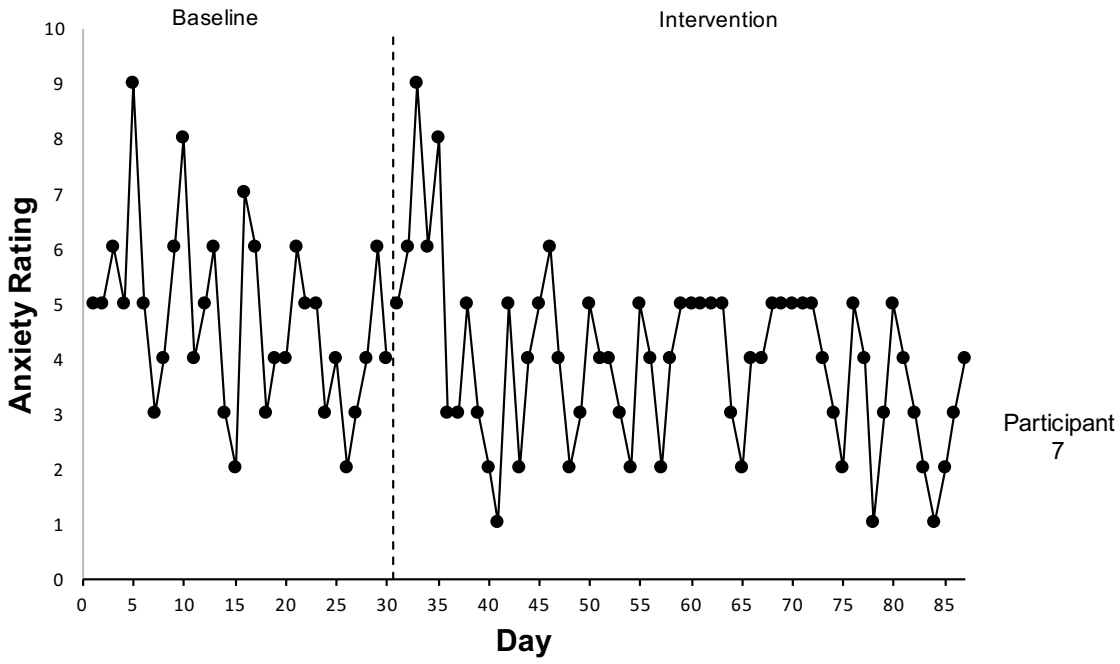

Figure 10. Daily Anxiety Ratings for Participant 7

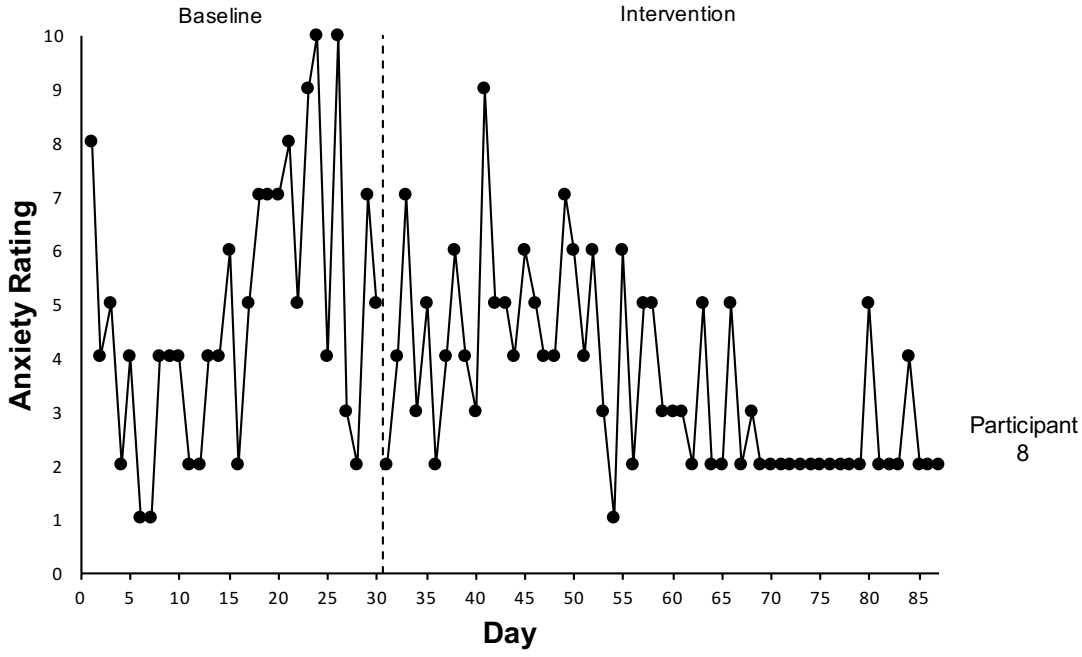

Figure 11. Daily Anxiety Ratings for Participant 8

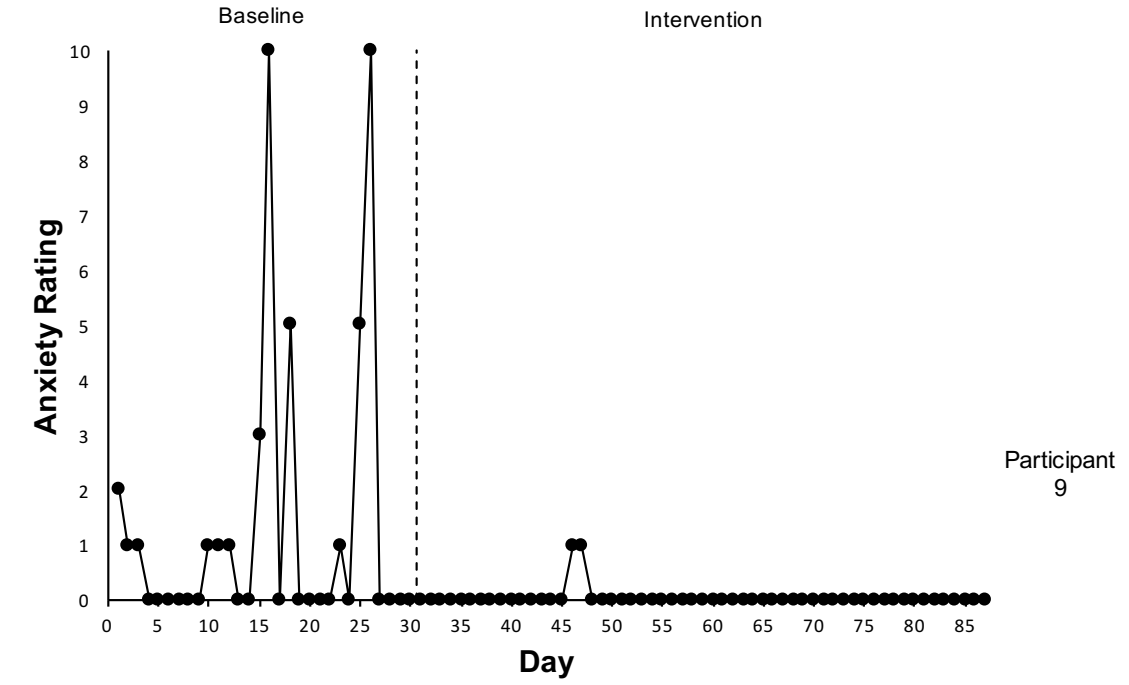

Figure 12. Daily Anxiety Ratings for Participant 9

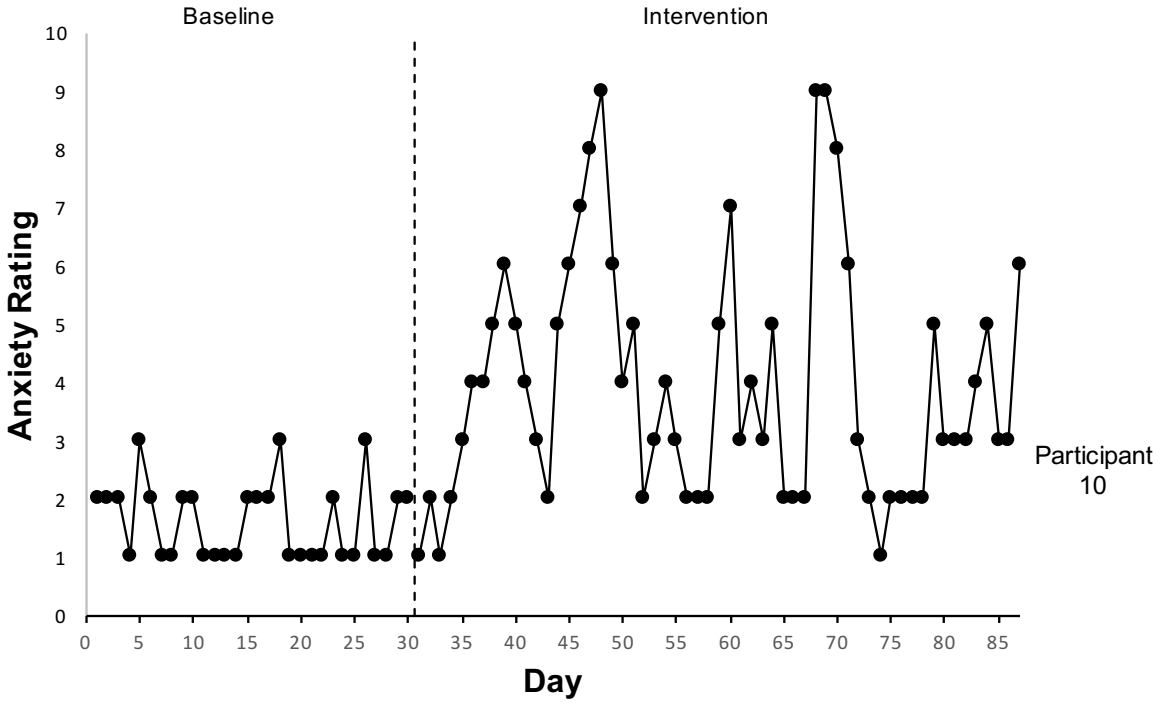

Figure 13. Daily Anxiety Ratings for Participant 10

Table 8

Daily Anxiety Rating Effect Sizes Across All Participants

Participant	Tau-U	Classification
1	-0.06	Limited to no change
2	-0.33	Small change
3	-0.03	Limited to no change
4	-0.39	Small change
5	+0.12	Limited to no change
6	-0.27	Small change
7	-0.27	Small change
8	-0.30	Small change
9	-0.37	Small change
10	+0.74	Large change

Note. .20 = small change, .60 = moderate change, .80 = large change, and >.80 = very large change (Vannest & Ninci, 2015)

(Tau-U = +.74), signifying that this participant experienced a significant increase in perceived anxiety from baseline to intervention.

Visual analyses across phases suggest a lower level of anxiety after intervention for seven participants, including Participants 1 (-.02), 2 (-.50), 4 (-.95), 6 (-2.22), 7 (-.80), 8 (-1.36), and 9 (-1.33). Level analysis for Participants 3 (+.27), 5 (+.06), and 10 (+2.33) indicated a higher level of anxiety after intervention in comparison to baseline. A decreasing trend or slope from baseline to intervention was observed for the majority of participants (i.e., Participants 1, 2, 3, 4, 6, 7, 8, and 9). An increasing trend was noted for Participant 10, suggesting heightened anxiety following intervention. Trends in data for Participant 5 were observed to be largely consistent (*M1* = 1.00, *M2* = 1.06). Variability analyses indicated that participant data were highly variable, with the greatest variability

(*SD* = 3.03) observed for Participant 6 during intervention. Participant 9 had the least variable data (*SD* = 0.19), particularly during the intervention phase.

Weekly Anxiety Ratings

Weekly anxiety was examined using a study-developed weekly anxiety rating scale (see Appendix G; adapted from Haygeman, 2015). Ratings by participant are shown in Figures 14 to 23. Missing data points are reflective of participant absences, as the weekly anxiety rating scale was completed at the start of each group session.

Participant 10 reported the highest average level of anxiety across both school (M = 5.00, *SD* = 3.81) and family categories (*M* = 5.56, *SD* = 1.51). Responses from Participant 3 and Participant 10 resulted in equal mean levels of peer anxiety (*M* = 4.56),

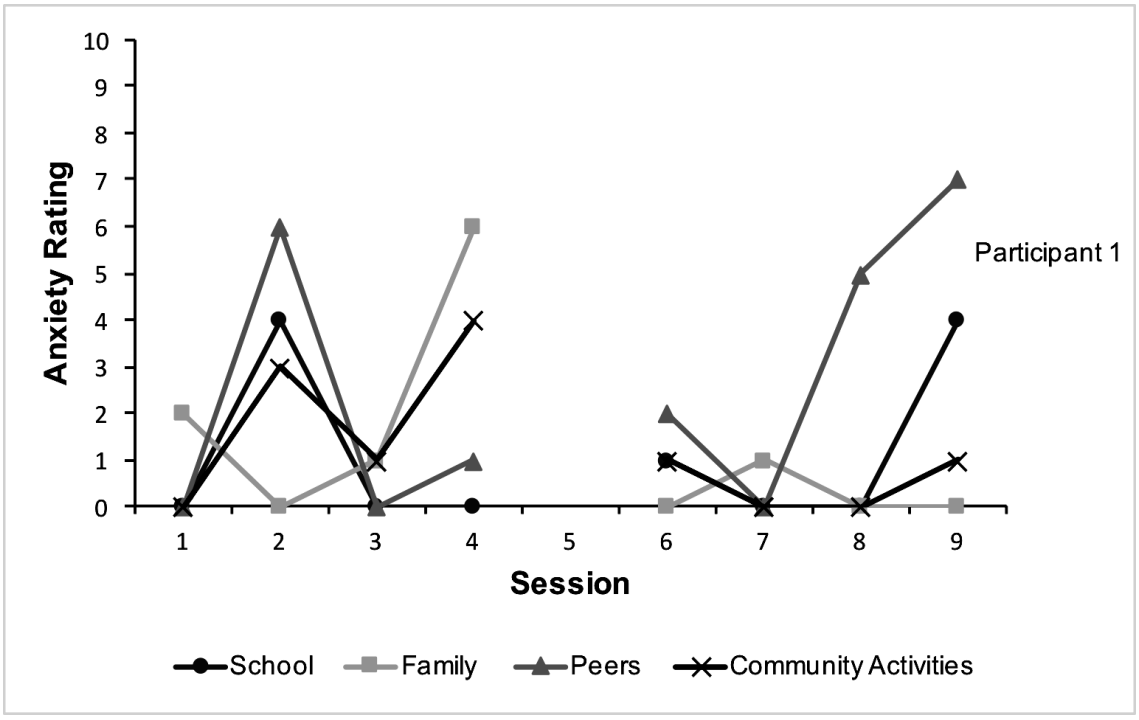

Figure 14. Weekly Anxiety Ratings for Participant 1

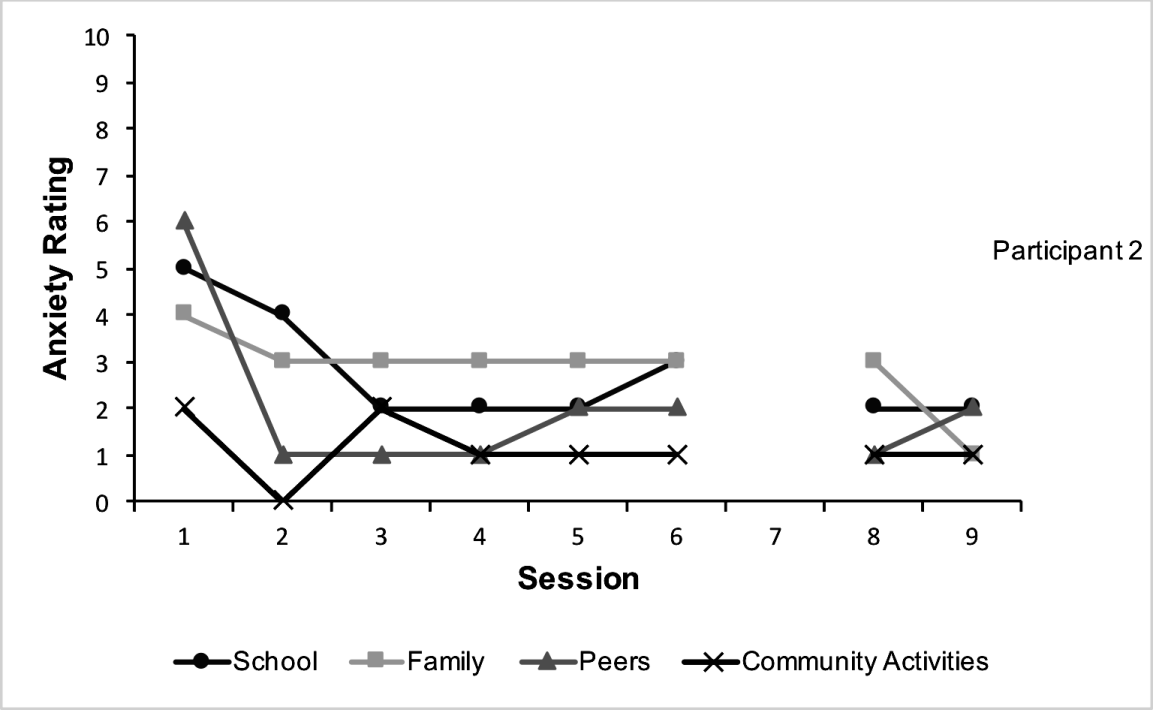

Figure 15. Weekly Anxiety Ratings for Participant 2

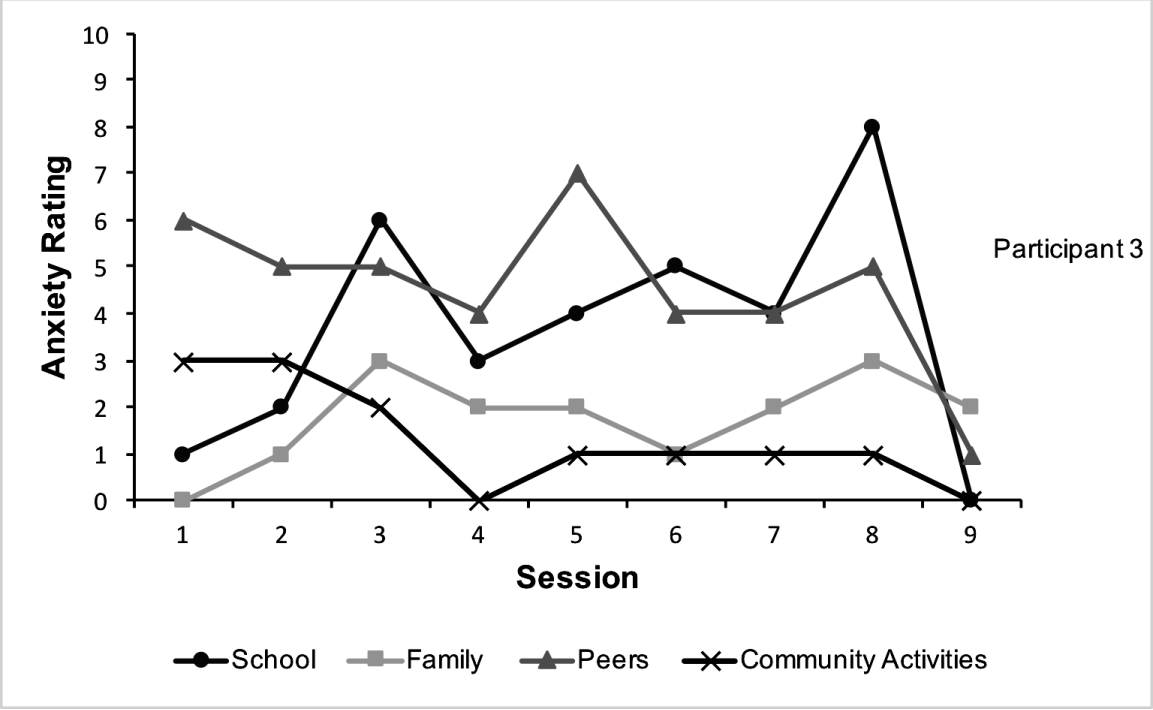

Figure 16. Weekly Anxiety Ratings for Participant 3

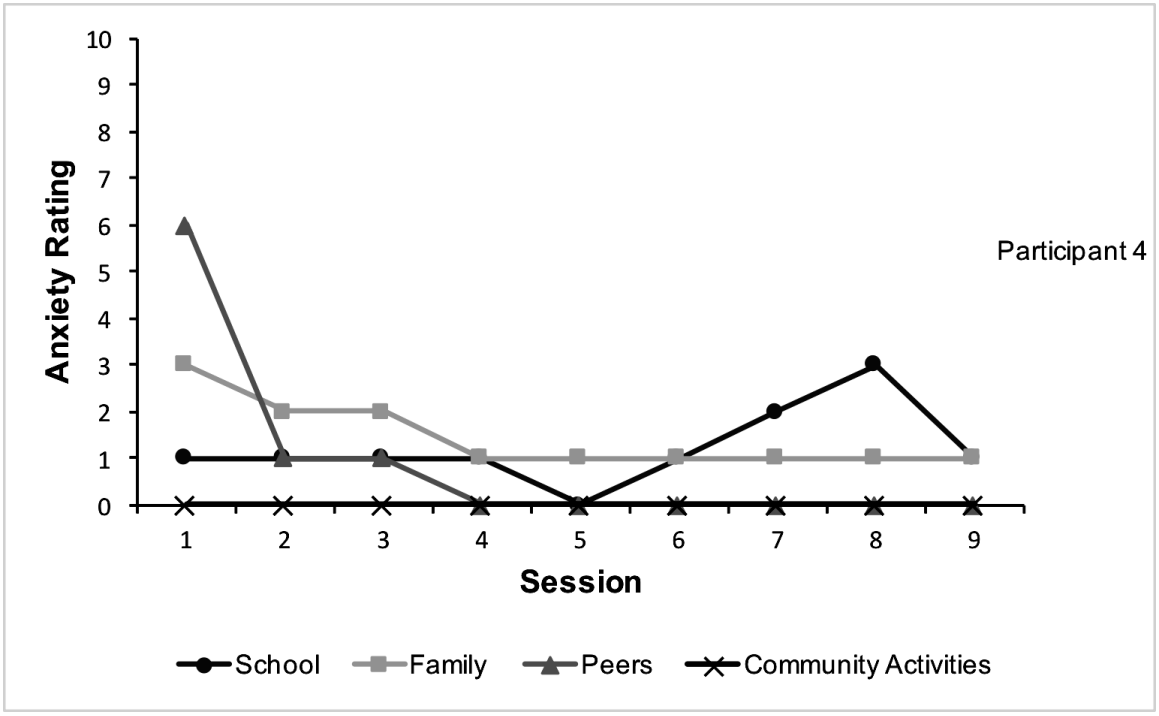

Figure 17. Weekly Anxiety Ratings for Participant 4

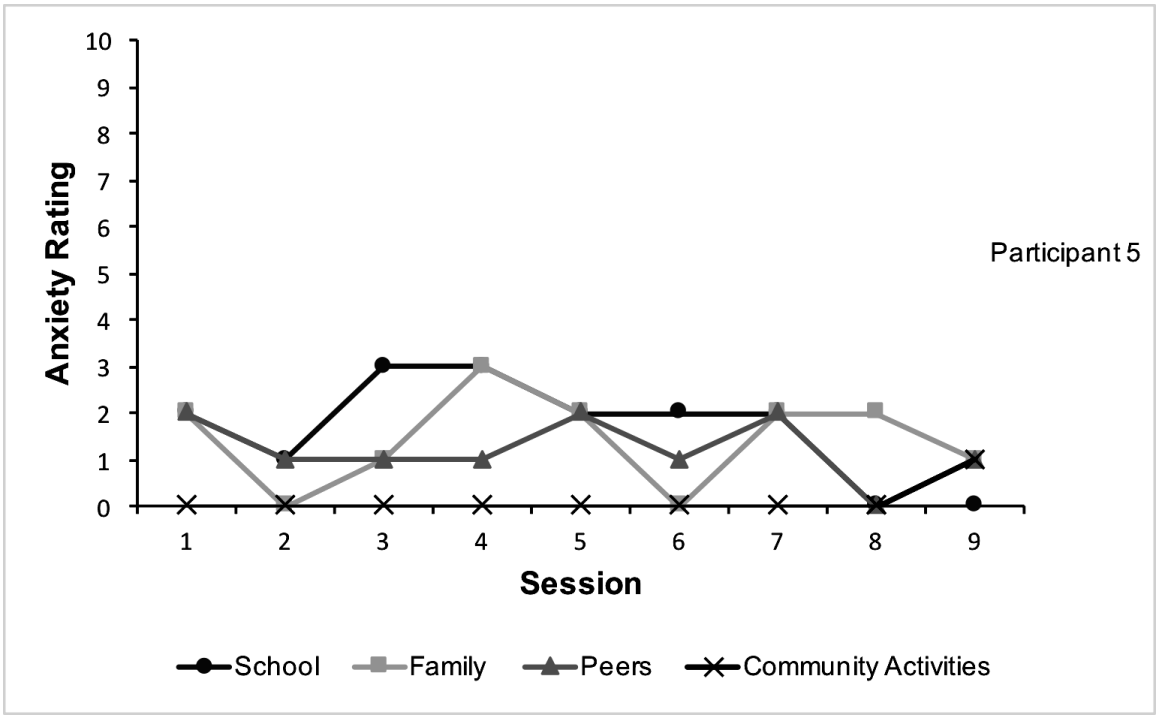

Figure 18. Weekly Anxiety Ratings for Participant 5

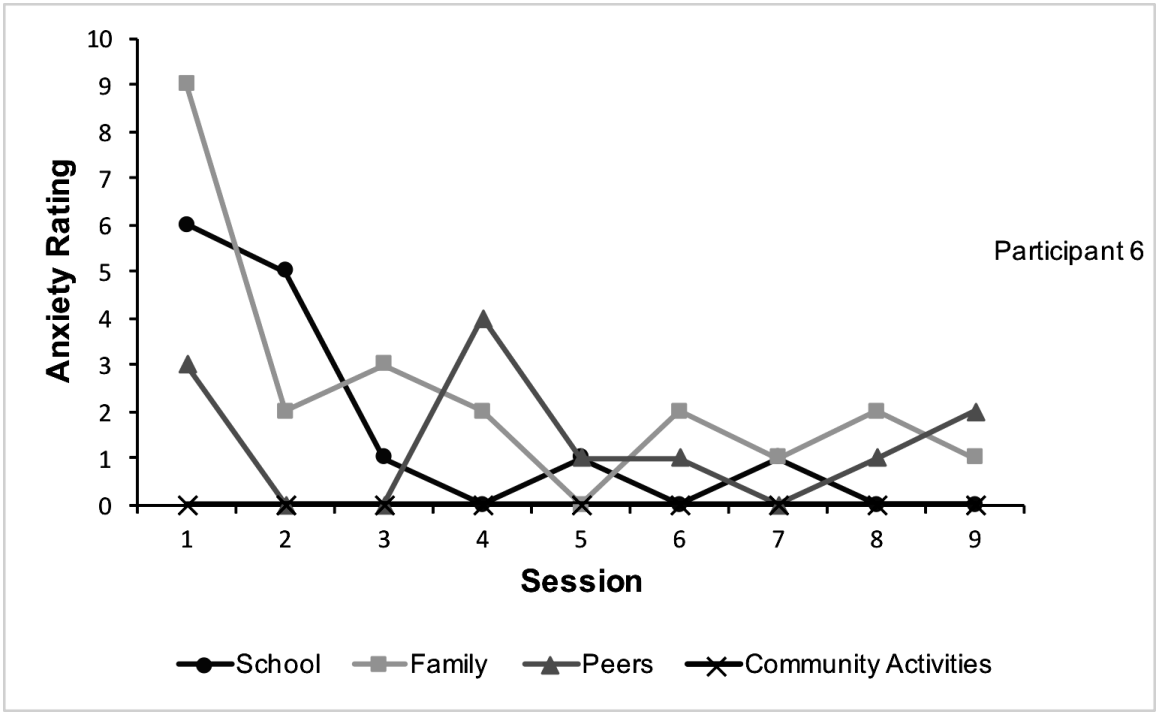

Figure 19. Weekly Anxiety Ratings for Participant 6

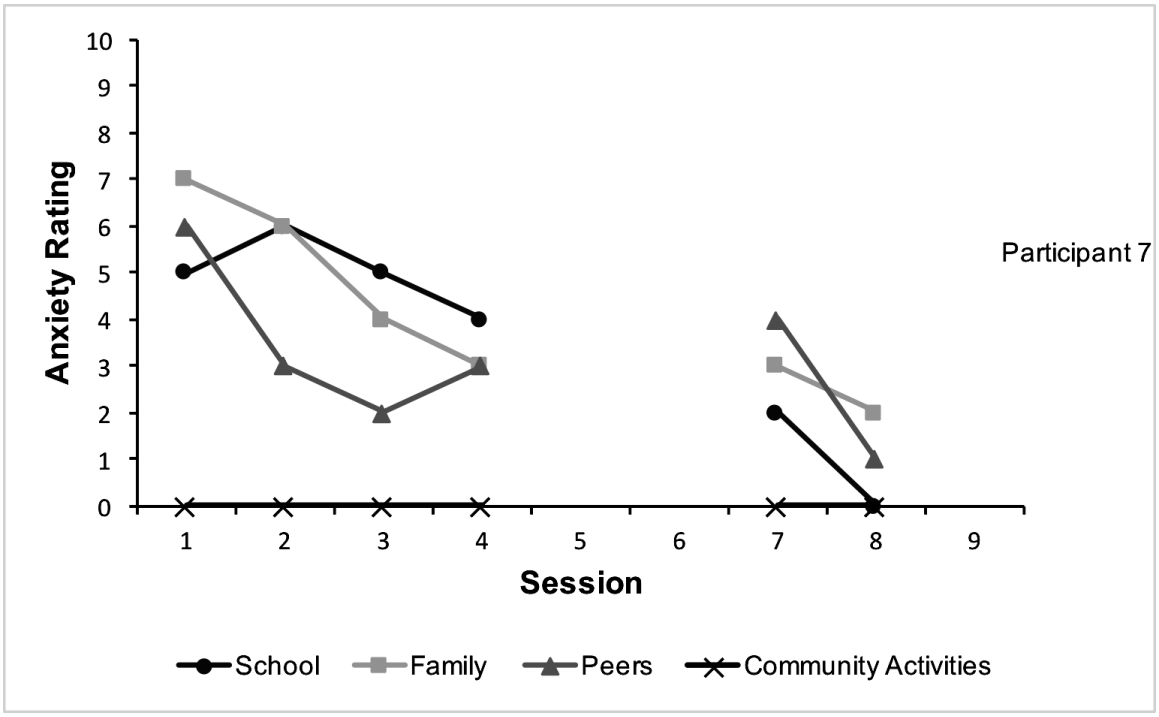

Figure 20. Weekly Anxiety Ratings for Participant 7

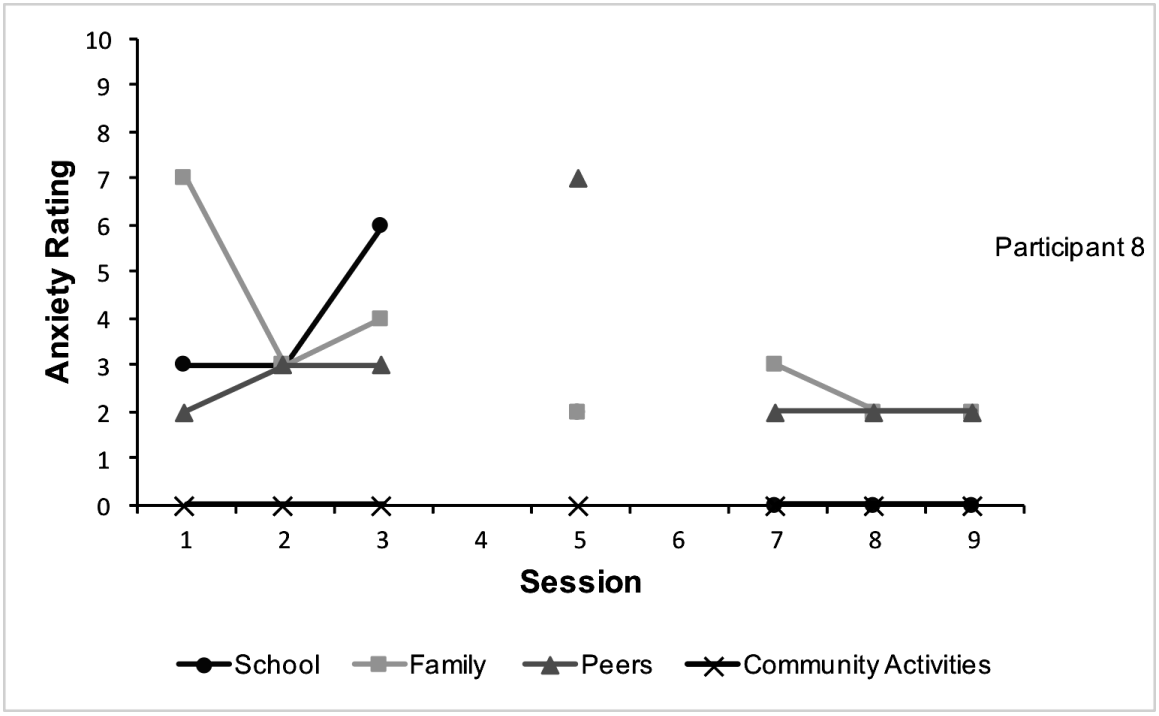

Figure 21. Weekly Anxiety Ratings for Participant 8

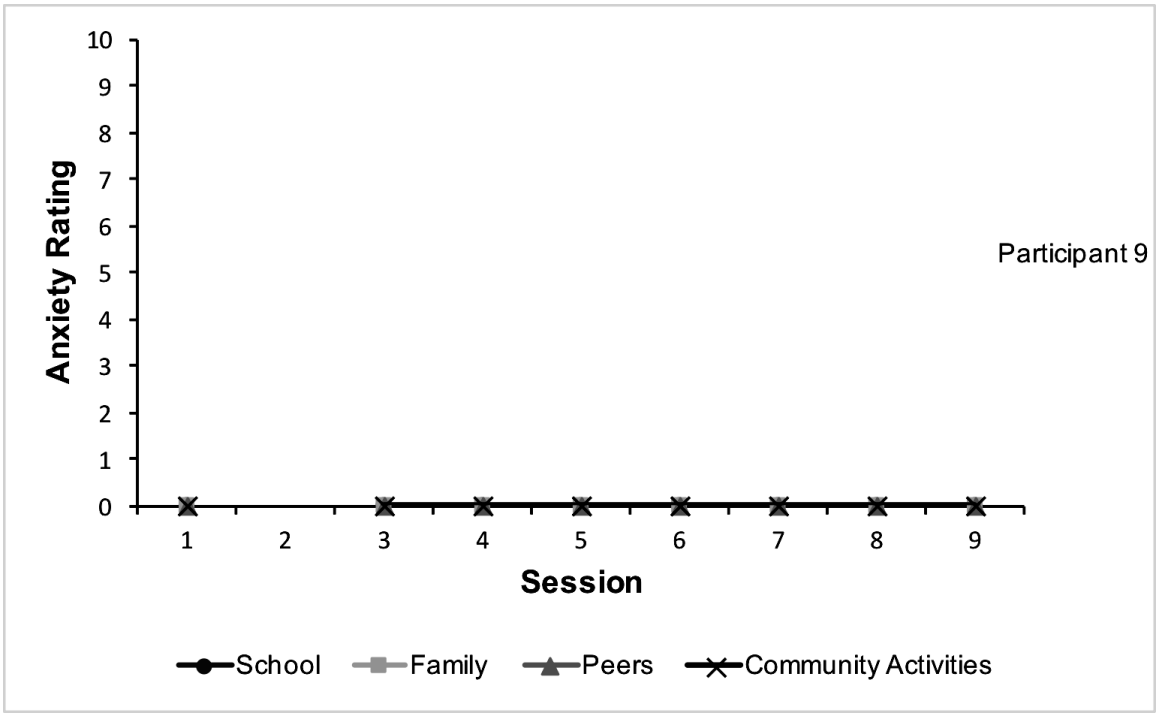

Figure 22. Weekly Anxiety Ratings for Participant 9

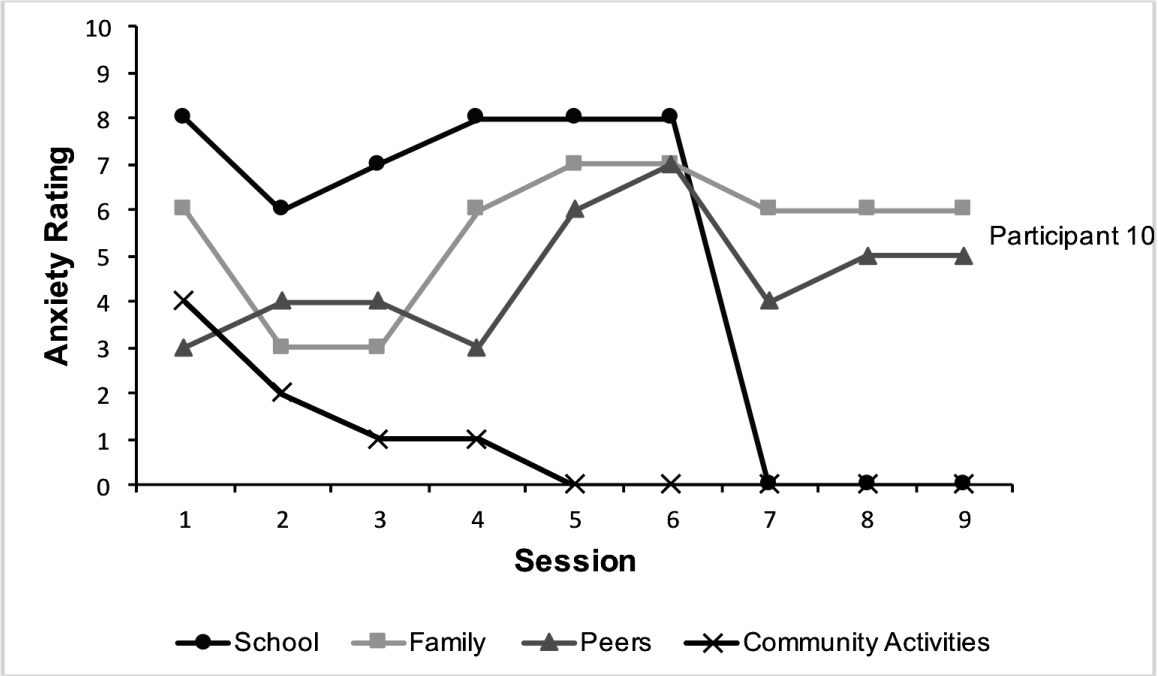

Figure 23. Weekly Anxiety Ratings for Participant 10

with Participant 3 also reporting the highest level of community anxiety (M = 1.33, SD = 1.12). Participant 9 had the lowest reported level of anxiety across all weekly sessions (M = 0.00, SD = 0.00). Table 9 shows participant mean responses to the weekly anxiety scale, by scale category. On average, participants experienced the most anxiety from family relations and situations (M = 2.42, SD = 1.61), followed by peers (M = 2.33, SD = 1.53), then school (M = 2.27, SD = 1.49), and, finally, community activities (M = 0.47, SD = 0.60).

Table 9

Means and Standard Deviations of Weekly Anxiety Ratings by Participant

	Peers	School	Family	Community
Participant	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
1[b]	2.63 (2.92)	1.13 (1.81)	1.25 (2.05)	1.25 (1.49)
2[b]	2.00 (1.69)	2.75 (1.16)	2.88 (0.83)	1.13 (0.64)
3[a]	4.56 (1.67)	3.67 (2.50)	1.78 (0.97)	1.33 (1.12)
4[a]	0.89 (1.96)	1.22 (0.83)	1.44 (0.73)	0.00 (0.00)
5[a]	1.22 (0.67)	1.67 (1.12)	1.44 (1.01)	0.11 (0.33)
6[a]	1.33 (1.41)	1.56 (2.30)	2.44 (2.60)	0.00 (0.00)
7[d]	3.17 (1.72)	3.67 (2.25)	4.17 (1.94)	0.00 (0.00)
8[c]	3.00 (1.83)	2.00 (2.24)	3.29 (1.80)	0.00 (0.00)
9[b]	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
10[a]	4.56 (1.33)	5.00 (3.81)	5.56 (1.51)	0.89 (1.36)
Overall	2.33 (1.53)	2.27 (1.49)	2.42 (1.61)	0.47 (0.60)

Note. Scale 0-10 (0 = no anxiety, 10 = extreme anxiety). Averaged across: [a]9 weeks, [b]8 weeks, [c]7 weeks, [d]6 weeks.

Pre- and Posttreatment Anxiety

Self-Report Ratings

Adolescent anxiety symptomatology was also examined using the Anxiety Scale for Children – Autism Spectrum Disorder (ASC-ASD; Rodgers et al., 2015). Table 10 shows pre- and posttreatment as well as change scores by participant across each ASC-ASD scale. Participants 4 (-13.00) and 8 (-11.00) evidenced the greatest change from pre- to posttreatment, with all subscale scores decreasing by one or more points. Subscale decreases also resulted in a total scale score decrease of two or more points for five participants. Responses from Participants 9 (+2.00) and 10 (+11.00) resulted in an increase in total scale scores. Overall, the greatest subscale decreases from pre- to posttreatment were observed on the uncertainty scale (M = -2.00, SD = 3.74).

Parent-Report Ratings

Parents further reported on pre- and posttreatment adolescent anxiety symptomatology by completing the ASC-ASD-P (Rodgers et al., 2015). Table 11 shows pre- and posttreatment as well as change scores by parent across each ASC-ASD-P scale. Responses from parents seven (-26.00), eight (-14.00), and two (-10.00) evidenced the greatest change from pre- to posttreatment, with three or more subscale scores decreasing by at least two points. Subscale decreases also resulted in a total scale score decrease of three or more points for four parents. Responses from parents one (+9.00), four (+13.00), and five (+1.00) resulted in an increase in total scale scores. Overall, the greatest subscale decreases from pre- to posttreatment were observed on the uncertainty scale (M = -1.70, SD = 4.72).

Table 10

Pre- and Posttreatment Scores on the Self-Report ASC-ASD

	Pre	Post	Change	Pre	Post	Change
	Participant 1			Participant 2		
PA	5	4	-1	10	11	+1
AA	2	1	-1	1	2	+1
SA	3	2	-1	11	9	-2
U	7	8	+1	13	13	0
Total	17	15	-2	35	35	0
	Participant 3			Participant 4		
PA	10	9	-1	6	5	-1
AA	3	2	-1	5	1	-4
SA	2	3	+1	4	3	-1
U	8	6	-2	11	4	-7
Total	23	20	-3	26	13	-13
	Participant 5			Participant 6		
PA	5	7	+2	6	7	+1
AA	4	2	-2	0	2	+2
SA	5	5	0	7	1	-6
U	17	12	-5	12	6	-6
Total	31	26	-5	25	16	-9
	Participant 7			Participant 8		
PA	6	4	-2	4	1	-3
AA	0	0	0	5	3	-2
SA	3	4	+1	7	5	-2
U	6	3	-3	4	0	-4
Total	15	11	-4	20	9	-11
	Participant 9			Participant 10		
PA	0	1	+1	8	8	0
AA	0	0	0	3	5	+2
SA	2	2	0	6	10	+4
U	1	2	+1	12	17	+5
Total	3	5	+2	29	40	+11

Note. Highest possible scores: PA = performance anxiety (15), AA = anxious arousal (18), SA = separation anxiety (15), U = uncertainty (24), Total (72). No indicative clinical cut-off scores exist. The complete ASC-ASD scale by Rodgers and colleagues (2015) is available for download at http://research.ncl.ac.uk/cargo-ne/ASC.html.

Table 11

Pre- and Posttreatment Scores on the Parent-Report ASC-ASD-P

	Pre	Post	Change	Pre	Post	Change
	Parent 1			Parent 2		
PA	3	6	+3	7	4	-3
AA	0	0	0	1	1	0
SA	0	1	+1	7	5	-2
U	7	12	+5	14	9	-5
Total	10	19	+9	29	19	-10
	Parent 3			Parent 4		
PA	9	7	-2	2	3	+1
AA	3	3	0	1	3	+2
SA	3	0	-3	2	7	+5
U	10	9	-1	12	17	+5
Total	25	19	-6	17	30	+13
	Parent 5			Parent 6		
PA	1	2	+1	8	4	-4
AA	1	1	0	1	2	+1
SA	5	3	-2	1	2	+1
U	12	14	+2	17	12	-5
Total	19	20	+1	27	20	-7
	Parent 7			Parent 8		
PA	11	8	-3	3	4	+1
AA	8	3	-5	11	7	-4
SA	14	6	-8	14	9	-5
U	20	10	-10	14	8	-6
Total	53	27	-26	42	28	-14
	Parent 9			Parent 10		
PA	4	4	0	9	7	-2
AA	1	1	0	3	2	-1
SA	3	3	0	4	2	-2
U	6	3	-3	18	19	+1
Total	14	11	-3	34	30	-4

Note. Highest possible scores: PA = performance anxiety (15), AA = anxious arousal (18), SA = separation anxiety (15), U = uncertainty (24), Total (72). No indicative clinical cut-off scores exist. The complete ASC-ASD-P scale by Rodgers and colleagues (2015) is available for download at http://research.ncl.ac.uk/cargo-ne/ASC.html.

Results of Research Question #5

- Did participants show evidence of decreased rigidity over the course of the intervention?

Pre- and posttreatment rigidity was examined using a study-developed, multirater Rigidity Rating Scale (see Appendices H and I). Table 12 shows pre- and posttreatment as well as change scores by participant. Notably, in all cases, parent report scores were higher than adolescent report scores, suggesting that parents observed a higher level of rigidity in their child at both pre- and posttreatment. Results indicated that the majority of adolescents and parents observed at least a one point decrease in rigidity following intervention (M = -4.70, SD = 8.34 [adolescent]; M = -2.10, SD = 5.55 [parent]), although responses were highly variable both within and across groups. More specifically, change scores indicate that 6 out of 10 adolescents and parents observed a decrease of one or more points in adolescent rigidity following intervention, with adolescent three reporting the greatest change (-20.00). In contrast, three adolescents and parents reported an increase in rigid behaviors following intervention, with positive change scores ranging from +1.00 to +8.00.

Examination of specific item ratings on the Rigidity Rating Scale (see Appendices H and I) indicates that, at baseline, both adolescents and parents similarly had the highest level of agreement (M = 5.90, SD = 1.70 [adolescent]; M = 6.20, SD = 1.03 [parent]) with item 10 (“I [my child] like[s] when things are predictable”). Following intervention, adolescents continued to report the highest level of agreement (M = 4.90, SD = 1.85) with item 10. In comparison, at postintervention, parents reported the highest level of agreement (M = 5.70, SD = 1.57) with item six (“my child views situations or problems

Table 12

Pre- and Posttreatment Total Scores on the Rigidity Rating Scale

	Adolescent			Parent		
Participant	Pre	Post	Change	Pre	Post	Change
1	34	24	-10	49	57	+8
2	36	26	-10	48	45	-3
3	54	34	-20	64	56	-8
4	45	45	0	56	58	+2
5	61	64	+3	62	57	-5
6	31	25	-6	62	62	0
7	39	32	-7	44	45	+1
8	33	24	-9	56	44	-12
9	11	17	+6	38	35	-3
10	49	55	+6	61	60	-1

Note. Scale 1-7 (1 = strongly disagree, 7 = strongly agree). Highest possible score = 70.

as black and white"). Notably, parents level agreement with item 10 was second highest (M = 5.60; SD = 1.65).

At baseline, adolescents reported the lowest level of agreement (M = 2.90, SD = 1.97) with item six ("I view situations or problems as black and white"). Following intervention, adolescents reported the lowest level of agreement (M = 2.40, SD = 1.43) with item three ("I try the same approach to a problem again and again"). Item six was rated higher by both groups two and three at post-intervention. At both pre- and postintervention, parents reported the lowest level of agreement (M = 4.20, SD = 1.55 [pre]; M = 4.10, SD = 1.20 [post]) with item eight ("my child likes things to stay in the same place").

The parent-report rigidity questionnaire (see Appendix I) further included an optional section in which parents could list specific observed behaviors and rate them on a corresponding severity scale ranging from “not severe” (1) to “very severe” (7). Table 13 includes behaviors that parents listed as either being severe or very severe. These specific comments describe a range of problem behaviors, and many highlight the challenges that adolescents with ASD face when dealing with uncertainty, inflexible thinking, and changes/newness, both across the day and in social interactions.

Table 13

Additional Rigid Behaviors Parents Reported as Severe or Very Severe

Parent Written Responses
Difficulty self-calming when experiencing unmet expectations
Being away from Mom, Dad, and home
Pacing back and forth when upset
Not knowing how to tell people when to leave him/her alone
Difficulty starting conversations with teenagers
Becoming frustrated when he/she does not understand something in school
Only talking about animals and nature facts with peers
Tendency to clam-up when it's a topic that he/she feels uncomfortable about
Strong sense of justice
Unable to let past events go
Dislike of showers and baths

Results of Research Question #6

- Did participants show evidence of an increase in self-reported mindfulness over the course of the intervention?

Pre- and Posttreatment Mindfulness

Adolescent participants completed the CAMM (Greco, Baer, & Smith, 2011; see Appendix J) at both pre- and postintervention. In general, change scores (presented in Table 14) suggest that the majority of participants (6 out of 10) observed a decrease in mindfulness skills following the intervention (*M* = -1.10, *SD* = *-6.51)*; however, many decreases were marginal. If results from Participant 1 are eliminated as an outlier, overall mean pre-and posttest scores are almost identical (i.e., *M* = 23.89, *SD* = 6.58 [pre] and *M* = 24.22, *SD* = 8.57 [post]), suggesting, on average, little change in personal mindfulness as a result of the 9-week intervention.

Mindfulness Practice

Participants were asked to practice mindfulness for a minimum of 10 min per day during group intervention. Data regarding minutes of mindfulness practiced are listed in Table 15. Prior to intervention, all participants practiced 0 min of mindfulness (*M* = 0.00, *SD* = 0.00), regardless of group order or start date. During intervention, 7 out of 10 participants practiced greater than 5 min per day, on average, which is an improvement from baseline. The highest number of minutes of mindfulness practiced was 640, which resulted in an average daily total of 10 min (*SD* = 2.52). The lowest number of minutes of mindfulness practiced was 111 min, resulting in a daily practice average of 1.73 min (*SD*

Table 14

Pre- and Posttreatment Scores on the CAMM

Participant	Pre	Post	Change
1	27	13	-14
2	18	19	+1
3	15	14	-1
4	32	31	-1
5	23	18	-5
6	20	28	+8
7	28	21	-7
8	28	32	+4
9	33	39	+6
10	18	16	-2

Note. Scale of 0-4 (0 = never true, 4 = always true). Highest possible score = 40.

Table 15

Adolescent Minutes of Mindfulness Practiced Prior to and During Intervention

	Baseline		*Intervention*		
Participant	Daily Minutes Mean (SD)	Total Minutes	Daily Minutes Mean (SD)	Total Minutes	Parent Level of Agreement
1	0.00 (0.00)	0	2.67 (6.94)	171	91%
2	0.00 (0.00)	0	9.72 (1.36)	622	100%
3	0.00 (0.00)	0	10.00 (2.52)	640	100%
4	0.00 (0.00)	0	5.77 (4.34)	370	100%
5	0.00 (0.00)	0	8.28 (3.80)	530	100%
6	0.00 (0.00)	0	1.73 (2.82)	111	89%
7	0.00 (0.00)	0	8.00 (3.40)	456	100%
8	0.00 (0.00)	0	4.96 (6.20)	283	100%
9	0.00 (0.00)	0	5.11 (4.22)	291	100%
10	0.00 (0.00)	0	3.86 (5.26)	220	100%

Note. Daily range: 0-20 min.

= 2.82). Parents of two adolescent participants indicated some level of disagreement with adolescent-reported data. Interestingly, parent disagreements were reported for the two participants who practiced the least, suggesting that these participants may have practiced even fewer minutes.

CHAPTER 4

DISCUSSION

This study evaluated the feasibility of implementing an adaptation of the *Mindful Schools* curriculum offered in a group format to adolescents with ASD in an outpatient clinical setting. Feasibility focus areas included the following: participation and group completion; treatment integrity; and treatment acceptability. Additionally, the effects of the intervention on adolescent anxiety, rigidity, and mindfulness were examined utilizing both self- and parent-report measures.

Prior Research

Research to date has shown positive effects of MBIs for adult populations with diverse psychological, physical, and medical conditions (Ruff & Mackenzie, 2009; Ludwig & Kabat-Zinn, 2008). Given these far-reaching positive effects for adults, more recent research has examined the effects of MBIs with children and adolescents, with similar positive effects observed (Biegel et al., 2009; Zoogman et al., 2014); however, there is a significant lack of research examining use of MBIs with individuals with ASD to decrease internalizing symptoms. This is particularly concerning, given that almost half of all individuals with ASD experience some form of anxiety (van Steensel et al., 2011). Researchers (Zoogman et al., 2014) have further identified the need for increased

research regarding use of MBIs in outpatient clinical settings with children and adolescents, given that much of the current research has been performed with captive populations in schools and other residential facilities or day programs.

Presently, there is significant support for well-known MBIs, such as MBSR and MBCT; however, less is known about the effectiveness of other increasingly popular and widespread interventions, such as the *Mindful Schools* curricula. *Mindful Schools* offers two curricula, including a Kindergarten – 5th grade curriculum (Mindful Schools, 2014) and the Adolescent (or Middle – High School) curriculum (Mindful Schools, 2015). Training in the *Mindful Schools* curricula is easily accessible and available online, making it an attractive intervention for professionals in settings where time and resources are often limited. Preliminary evidence has shown positive effects of utilizing the *Mindful Schools* curricula to decrease youth symptoms of depression and stress and to improve well-being, personal mindfulness, response to chronic headache pain, and school classroom functioning (Black & Fernando, 2014; Haygeman, 2016; Hesse et al., 2015; Leihr & Diaz, 2010), although evidence remains largely limited.

Given the dearth of evidence in the area of MBI research including adolescents with ASD and comorbid internalizing symptoms, as well as the limited peer-reviewed research regarding the effectiveness of the *Mindful Schools* curriculum, the present study was primarily conducted as a feasibility study. Specifically, this study sought to fill in above-mentioned gaps by examining implementation feasibility of the adapted "Mindful Moments for Teens" program. The curriculum was first adapted by combining two of the *Mindful Schools* Adolescent Curriculum (Mindful Schools, 2015) lessons per week. Additional adaptations included the following: a longer class time (1½ hours); a

beginning check-in at the start of each group; a review of the previous week's lesson; a 10-min break and snack time; an end-of-session wrap-up discussion, reviewing practice expectations; the addition of the ABC Technique (Levitt, 2015); and a daily homework assignment (i.e., 10 min of mindfulness practice). The current study is the first, to our knowledge, to examine feasibility and preliminary effectiveness of the *Mindful Schools* curriculum on the mental health of adolescents with ASD in an outpatient clinical setting.

Main Findings

Intervention Feasibility

Results of the first three research questions affirmed the feasibility of implementing the adapted *Mindful Schools* curriculum with the specified population.

Participant Enrollment and Retention

Participant enrollment and retention was examined utilizing group attendance logs. Descriptive statistics indicated that a total of 64.3% of participants completed the "Mindful Moments for Teens" group, attending at least 7 out of the 9 group sessions. Factors impacting group completion for remaining participants included the following: lack of parent investment in the treatment program, limited adolescent interest in group content, high levels of adolescent participant anxiety in group settings, and adolescent involvement in extracurricular school activities.

Despite participant attrition, a majority of participants regularly attended and completed the "Mindful Moments for Teens" group. The high rate of group completion is arguably due, at least in part, to the use of positive reinforcement, which is the most

widely applied principle of behavior analysis (Cooper, Heron, & Heward, 2007). Group completers appeared motivated by the attendance drawing, often describing what they would spend the gift card money on during the ticket dispersal at the start of each group. This study demonstrates further support for the use of positive reinforcement to increase therapeutic group attendance rates for adolescents with ASD. Still, the generalizability of attendance data is limited, particularly given that there were only nine sessions.

Treatment Integrity

Treatment integrity was evaluated in order to determine if the group leader could implement the adapted program as intended to all groups throughout the treatment phase. Percent agreement calculations, based on independent treatment integrity ratings from the PI and a trained RA, indicated an average of 97.62% (SD = 1.12) treatment adherence. In addition to group leader familiarity with mindfulness techniques, manualization of the program may also have contributed to high levels of intervention fidelity. Both observers highlighted that only one lesson activity had to be modified based on participant response. The group leader easily modified this activity by having participants share stories in a group format, as opposed to in pairs. All other curriculum components were implemented without modification.

Given that intervention modifications are common when using cognitive behavior therapy with individuals with ASD (Wood et al., 2015), it is not surprising that at least one modification had to be made to the *Mindful Schools* curriculum. Limited modifications to the *Mindful Schools* lessons show promise for the use of the curricula with adolescents with ASD. Future development of a validated treatment integrity scale

specific to the *Mindful Schools* curriculum would add value to expected feasibility research in this area.

Participant Satisfaction

Participant satisfaction was examined utilizing both the CIRP (Witt & Elliott, 1985) and the BIRS (Elliott & Von Brock Treuting, 1991). The adolescent participants' responses to the CIRP were mostly favorable ($M = 5.11$, $SD = 1.32$), indicating satisfaction with the program. Question four responses from participants in group two suggested that there may be a better method to handle stress and anxiety for some adolescents with ASD and comorbid anxiety, although these responses appeared to be outliers based on other questionnaire responses. Nevertheless, all participants indicated liking the mindfulness program and reported high levels of satisfaction with the group leader. Participant responses also suggested belief that skills learned may improve aspects of school performance. Qualitative comments were similar to quantitative results, indicating that participants valued group lessons and found techniques useful. Most notably, comments suggested that future use of mindfulness skills and techniques was likely for some.

Parent responses to the BIRS were positive overall ($M = 4.66$, $SD = 1.25$), yet indicated slightly less satisfaction with the program than adolescent participants. More specifically, items that focused on the intervention program itself were rated positively. This indicates that although anxious and rigid behaviors were not significantly reduced, parents liked the intervention program and mindfulness skills taught. Qualitative remarks indicated parent desire for a larger number of adolescent participants in each group,

detailed handouts of group lessons and activities, and the opportunity to practice alongside the teens. One parent expressed to the PI that, each week, her son would stand by the front door and shout at her to hurry up so that he would not miss the group. This parent highlighted that this was the first group, out of many social skills groups, that her son appeared to enjoy and was also motivated to attend. Both quantitative and qualitative remarks, however, highlighted general parent skepticism of adolescent sustained use of mindfulness techniques over time, particularly when the weekly reward for practicing mindfulness outside of session was removed.

Intervention Effectiveness

Although participants attended the group and reported liking the intervention program, pre- and posttreatment measures demonstrated that the adapted intervention had a limited impact on adolescent anxiety, rigidity, and mindfulness following the 9-week intervention.

Anxiety Symptomatology

Anxiety symptomatology was first examined by means of participant daily anxiety ratings. These ratings were collected prior to intervention and throughout participant enrollment in the "Mindful Moments for Teens" group. Tau-U calculations suggest limited to no overall intervention effect (Tau-U = -.09) on daily anxiety when averaged across all participants; however, intervention effects were clearly mixed. Six of nine participants reported experiencing a small decrease in daily anxiety symptomatology (with Tau-U calculations ranging from -.27 to -.39), while three experienced limited to no

intervention effect on daily anxiety. In contrast, Tau-U calculations (Tau-U = +.74) for Participant 10 indicated a large increase in anxiety following the intervention. This may be due in part to an increasing number of self-reported psychosocial stressors as well as heightened awareness of anxiety following group participation. More specifically, following training during the "Mindful Moments for Teens" group, Participant 10 may have recognized previously limited awareness of anxiety, ultimately resulting in heighted scores at postintervention. Still, intervention effects on participant daily anxiety were limited overall.

Similar to Tau-U results, visual analyses of graphs indicated that participant data were highly variable, highlighting concerns regarding self-report subjective units of distress (SUDs) ratings for adolescents with ASD. Variable daily participant responses are unsurprising, given that individuals with autism often have a difficult time personally identifying and accurately describing internal emotional states (South & Rodgers, 2017). Additionally, a specific time for nightly data collection was not set. It is possible that participants completed ratings after a variety of tasks, some of which may have been nonpreferred or anxiety-provoking. Future research should incorporate other measures of daily anxiety apart from daily SUDs ratings.

Next, anxiety symptomatology was evaluated utilizing data from participant weekly anxiety ratings. These ratings were obtained at the start of each weekly group session. Descriptive analyses indicated that, on average, participants experienced the most anxiety from family relations and situations (M = 2.42, SD = 1.61), followed by peers (M = 2.33, SD = 1.53), then school (M = 2.27, SD = 1.49), and, finally, community activities (M = 0.47, SD = 0.60). In general, many of the group participants indicated

limited community involvement, which may explain self-rated low community anxiety levels. Overall, results from the weekly anxiety ratings highlight that adolescents with ASD may experience the most anxiety from social relations and/or interaction, which coincides with diagnostic criteria (American Psychiatric Association, 2013) and previous descriptions of atypical anxiety presentations in youth with ASD (i.e., social fearfulness; Kerns et al., 2014).

Finally, anxiety symptomatology was examined utilizing data from both self- and parent-report versions of the ASC-ASD (Rodgers et al., 2015). Responses from two adolescent participants (4 and 8) resulted in a decrease of 11 or more total scale points, with all subscale scores decreasing by one or more points. Similarly, three parents reported total scale decreases of 10 or more points for three adolescents (two, seven, and eight). Both self- and parent-report measures of adolescent anxiety symptomatology evidenced the greatest decrease from pre- to posttreatment in the area of uncertainty (M = -2.00, SD = 3.74; M = -1.70, SD = 4.72). This is particularly encouraging given that youth with ASD experience higher rates of intolerance to uncertainty than typically developing comparisons (South & Rodgers, 2017); however, while results of ASC-ASD responses appear positive, interpretation is difficult, given the lack of clinical cutoff scores. Future research should aim to establish clinical cutoffs, particularly given the likelihood of continued use of the measure in anxiety research for adolescents with ASD.

Previously, Zoogman and colleagues (2014) conducted a meta-analytic review and found small overall effects of mindfulness-based treatments for youth populations (del = 0.23). Tau-U effect sizes for six of 10 individual participants from the present study are comparable to the above-listed results; however, the remaining participants'

responses indicated limited to no effect of the adapted intervention on anxiety. Moreover, one participant noted a large increase in anxiety. Overall, these results suggest that more research is needed to examine the effects of MBIs on the internalizing symptoms of adolescents with ASD, particularly given the varied and limited effects of the adapted intervention on adolescent-reported anxiety.

Rigidity

Adolescent rigidity was examined by means of the study-developed Rigidity Rating Scale, which was administered to adolescents and parents at both pre- and postintervention. This scale was created and administered because individuals with ASD and anxiety often show an increase in RRBs to exert control and make situations more predictable in times of uncertainty and stress (Wingham et al., 2015). Notably, in all cases, parent-report scores were higher than adolescent-report scores, suggesting that parents observed a higher level of rigidity in their child at both pre- and posttreatment. Parents further described unique problem behaviors in the optional section of the Rigidity Rating Scale, highlighting increased adolescent rigidity and inflexible thinking in order to cope with certain uncomfortable or anxiety-provoking situations. Overall, responses on the Rigidity Rating Scale were variable both within and across groups. While reported effects were difficult to interpret given the lack of established, clinical cut-off scores, decreases appear to be marginal. Development of a psychometrically-sound measure of adolescent RRBs is desperately needed, given that the majority of measures are presently intended for early childhood populations.

Mindfulness

Adolescent mindfulness was examined utilizing the CAMM (Greco, Baer, & Smith, 2011; see Appendix J). Results of the adolescent-completed CAMM suggest that the majority of participants observed a slight decrease in mindfulness following the "Mindful Moments for Teens" group intervention. This is evidenced by the negative overall mean change score (M = -1.10, SD = 6.17); however, when results from Participant 1 are eliminated as an outlier, overall mean pre- and posttest scores were found to only differ by .33 points (M = 23.89, SD = 6.58 [pre] and M = 24.22, SD = 8.57 [post]). Regardless, present results suggest a limited to slight decrease in adolescent mindfulness following intervention.

These results are similar to previous research. As de Bruin and colleagues (2014) describe, prior to intervention, adolescents in the present study might have rated themselves overly high, having no idea what mindfulness was. Following training during the "Mindful Moments for Teens" group, adolescents' perspectives may have shifted. Specifically, adolescents may have realized a more limited knowledge of mindfulness than initially reported, ultimately resulting in lower scores at postintervention (de Bruin et al., 2014). Greco and colleagues (2011) further highlight the need for additional research to determine if the CAMM is sensitive enough, or appropriate, to detect treatment effects for youth involved in MBIs. Results from the present study echo this call, given the limited to small decreasing effects of mindfulness that were found by means of the CAMM.

Additionally, as a part of the intervention, participants were encouraged to practice a minimum of 10 min of mindfulness per day as homework. Participants were

reinforced for completion of homework by means of a weekly ticket drawing. Participants appeared motivated by the drawing, pointing out desired items from the prize box and discussing plans with peers to meditate at home more often to increase chances of winning. Prior to the intervention, all participants practiced 0 min of mindfulness, regardless of group order or start date. During intervention, 7 out of 10 participants practiced an average of greater than 5 min of mindfulness per day. Participant 3 practiced a total of 640 min, resulting in an average practice total of 10 min per day. While this participant reported weekly benefits of at-home meditation practice during weekly check-ins, this shows rigid adherence to group leader instructions. This rigidity is consistent with diagnostic characteristics of ASD (American Psychiatric Assocation, 2013) and further demonstrates the effects of reward systems (Wood et al., 2015).

Again, parents indicated skepticism about sustained use of mindfulness over time. Specifically, during the final group meeting, one parent expressed that their adolescent "is now unwilling to use the skill, unless there's a reward." This not only shows behavioral rigidity, but also highlights that adolescents may have been more extrinsically motivated, as opposed to intrinsically motivated, to participate in mindfulness. Largely, adolescents in the present group appear to have experienced a mindful state when at group sessions, but appear to have not developed trait mindfulness (Bluth & Blanton, 2014). As Shapiro and colleagues (2006) describe, mindfulness "works" only when an individual truly embodies intention, attention, and attitude. As such, marginal effects on anxiety, rigidity, and mindfulness are not surprising.

Limitations and Future Research

While the current study contributes to the limited, yet growing field of mindfulness research with children and adolescents, the results need to be viewed in light of study limitations. The current study's findings are limited by a small overall sample size, as well as the attrition of four participants. Loss of these participants resulted in a particularly small number of adolescents in group two and further represent a loss of data. Small sample sizes both within and across the three groups calls into question the generalizability of these results to other participants or age groups.

Another limitation of this study is that there were fewer than five data points in the daily anxiety baseline phase for participants in group one. Future studies should evaluate the effectiveness of the *Mindful Schools* program on daily anxiety with at least five data points per phase to strengthen the research design. Additionally, there were no follow-up sessions conducted during the current study, and, as a result, it is unknown whether or not participants continued to practice mindfulness following intervention. Reinforcement fading for mindfulness practice may be of particular interest in future research. Moreover, the long-term impact of the mindfulness-based intervention on anxiety, rigidity, and mindfulness for adolescents with ASD is unclear. Future studies should incorporate follow-up sessions in order to determine the impact of MBIs on adolescent psychopathology over time.

Additionally, this study lacked a control group, making it difficult to conclude whether the observed changes are due to natural change over time, external therapies, or participation in the "Mindful Moments for Teens" group. The few marginal, yet positive, observed decreases in anxiety may have resulted from students going on summer break

towards the end of the intervention, allowing more time for preferred activities and less school-related stress. Ultimately, without an active control group to compare to the present intervention group, it is impossible to draw firm conclusions regarding observed effects. Future research should also include a supportive psychotherapy comparison group. This addition would help determine whether the mindfulness practices themselves impact target behaviors above and beyond the effects provided by group treatment.

Finally, the *Mindful Schools* curriculum was adapted for the current study. Specifically, two lessons were implemented per session, and additional, recommended treatment components were added, such as weekly review, breaks, and positive reinforcement. Although this study adds to the limited research on the *Mindful Schools* curricula, results should be interpreted with caution, given the present adaptation. Future research regarding the *Mindful Schools* curricula should implement lessons as intended with the identified population in both school and other unique treatment settings.

Future studies should also examine the impact of increased parental involvement in treatment. Specifically, parent participation in a co-occurring mindful parenting group that reinforces adolescent-learned skills and techniques may be considered. A three-condition design examining the effects of mindfulness training for adolescents and parents separately, as well as a combination of the two, is of particular interest. Moreover, examination of teacher involvement is warranted, particularly given that numerous adolescents in the present study reported that involvement in the group may help them do better in school. Finally, future studies should continue to examine the effects of MBIs on the anxiety, rigidity, and mindfulness of adolescents with ASD, with particular emphasis given to the identification of sensitive and specific self-report

measures.

Implications for Practice

Results of the current study suggest that it is feasible to implement a 9-week, mindfulness-based program in an outpatient clinical setting with adolescents with ASD. In particular, the adapted *Mindful Schools* program was found to be socially valid and rated favorably by parent and child participants. Adolescent attendance rates were also high, likely due to the use of positive reinforcement. Few modifications were made to *Mindful Schools* lessons, demonstrating preliminary support for use of the *Mindful Schools* curricula in future groups with adolescents with ASD.

Despite present findings suggesting that implementation is feasible, effects of the intervention on anxiety, rigidity, and mindfulness were limited. The apparent gap between intervention acceptability and intervention effectiveness can likely be explained as a cognitive dissonance reduction. Still, at the present time, use of MBIs to treat internalizing symptomatology in adolescents with ASD has limited support. The cost-benefit ratio of MBI implementation with this population also warrants further consideration, particularly given the minimal impacts on target behaviors. Future research is desperately needed to help bridge the gap between the limited empirical evidence and the potential promises of mindfulness training for children and adolescents, particularly for those with ASD and internalizing symptoms.

APPENDIX A

SAMPLE GROUP FLYER

MINDFUL MOMENTS FOR TEENS

LIVING WITH STRESS IN A HECTIC WORLD

TUESDAYS AND THURSDAYS 5:00PM TO 6:30PM

A 9-WEEK SOCIAL SKILLS GROUP DESIGNED FOR MIDDLE AND HIGH SCHOOL STUDENTS, AGES 12-17, DIAGNOSED WITH AN AUTISM SPECTRUM DISORDER. THE CLASS TEACHES ESSENTIAL MINDFULNESS SKILLS THAT CAN LEAD TO IMPROVED COPING WITH STRESS, ANXIETY, AND DIFFICULT SITUATIONS.

Effectiveness of this group will be examined as part of a research study sponsored by the University of Utah.

APPENDIX B

SAMPLE ATTENDANCE LOG

Participant Name	Contact Information	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
Jane Doe		X		X	X	X	X		X	X

APPENDIX C

TREATMENT INTEGRITY CHECKLIST

Treatment Integrity Checklist

Facilitator: _____ Date: _____

Group 1 Group 2 Group 3 Session Number: _____

Instructions: Put a ✓ next to each completed component.

Observations and Comments

Component	
Check-in with Group/Review	
Lesson 1 • Teaching • Practice • Discussion &/or Journaling	
Lesson 2 • Teaching • Practice • Discussion &/or Journaling	
Wrap up discussion/ Review of homework expectations	
Related activities to lesson	
Encouraged group discussion	
Encouraged participation from all group members	
Total Number of Checks	/7
Session Integrity %	

Adapted from Haygeman, E. (2015). *An adaptation of the Mindful Schools curriculum for adolescents: Feasibility and preliminary effectiveness on stress and mindfulness of adolescents in a public school setting* (Doctoral dissertation proposal).

APPENDIX D

CHILDREN'S INTERVENTION RATING PROFILE (CIRP)

Children's Intervention Rating Profile (CIRP)

Name _____ Date_____

1. **The method used to deal with my stress and anxiety was fair.**

   1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6

   I do not agree I agree

2. **The teacher was too harsh on me.**

   1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6

   I do not agree I agree

3. **The method used to deal with my stress and anxiety may cause problems with my friends.**

   1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6

   I do not agree I agree

4. **There are better ways to handle stress and anxiety than the one used.**

   1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6

   I do not agree I agree

5. **The method used by this teacher would be a good one to use with other children.**

   1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6

   I do not agree I agree

6. **I like the method used to deal with stress and anxiety.**

   1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6

   I do not agree I agree

7. **I think the method used for stress and anxiety will help me do better in school.**

   1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6

   I do not agree I agree

Additional Comments: _____

_____

_____

Adapted from Witt, J. C. & Elliott, S. N. (1985). Acceptability of classroom intervention strategies. In T. R. Kratochwill (Ed.) *Advances in school psychology* (4th ed.). Mahwah, NJ: Erlbaum.

APPENDIX E

BEHAVIOR INTERVENTION RATING SCALE (BIRS)

Behavior Intervention Rating Scale (BIRS)

Name_____ Date_____

1. Mindfulness is an acceptable intervention to improve coping skills.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

2. Most parents would find this intervention appropriate for poor coping skills.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

3. Mindfulness has proven effective in improving my child's coping skills.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

4. I would suggest the use of this intervention to other parents.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

5. Poor coping skills in my child are severe enough to warrant use of mindfulness.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

6. Most parents would find mindfulness suitable in targeting coping skills.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

7. I would be willing to use mindfulness in my home.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

8. Mindfulness has not resulted in negative side-effects for my child.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

9. Mindfulness is an appropriate intervention for a variety of children.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

10. Mindfulness is consistent with other coping skills programs I have used at home.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

11. Mindfulness is a fair way to teach coping skills.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

12. Mindfulness is reasonable for difficulties that arise from poor coping skills.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

13. I like the procedures used in mindfulness.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

14. Mindfulness is a good way to handle coping skills at home.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

15. Overall, mindfulness has been beneficial for my child.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

16. Mindfulness quickly improves a child's behavior.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

17. Mindfulness should produce a lasting improvement in a child's behavior.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

18. Mindfulness improves a child's behavior to the point that it does not noticeably deviate from other peer's behavior.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

19. Soon after using mindfulness, parents noticed a positive change in coping skills.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

20. The child's behavior will remain at an improved level even after the mindfulness group is discontinued.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

21. Using mindfulness has not only improved the child's behavior in the home, but also in other settings (e.g. classrooms, playground, community).

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

22. When comparing a participant with a non-participant peer before and after the use of the mindfulness group, the participant's and the peer's behavior are more alike after using mindfulness.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

23. Mindfulness has produced enough improvement in coping skills so the behavior no longer is a problem.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

24. Other behaviors related to coping skills have been improved by mindfulness.

1----------2----------3----------4----------5----------6

Strongly Disagree Strongly Agree

Additional Comments: _____

_____

_____

_____

_____

_____

Adapted from Elliott, S. N. & Von Brock Treuting, M. (1991). The behavior intervention rating scale: Developmental and validation of a pretreatment acceptability and effectiveness measure. *Journal of School Psychology, 29*, 43-51.

APPENDIX F

DAILY ANXIETY RATING SCALE

Please provide a rating of your anxiety level **for today only**, with (0) being *No Anxiety* and (10) being *Extreme Anxiety*.

0---------1---------2---------3---------4---------5---------6---------7---------8---------9---------10
(No Anxiety) (Extreme Anxiety)

APPENDIX G

WEEKLY ANXIETY RATING SCALE

Name:_____ Date: _____

Please provide a rating of your anxiety level in the following areas over the ***past week***, with (0) being *No Anxiety* and (10) being *Extreme Anxiety*.

Anxiety about *school:*

0---------1---------2---------3---------4---------5---------6---------7---------8---------9---------10

(No Anxiety) (Extreme Anxiety)

Anxiety about *family:*

0---------1---------2---------3---------4---------5---------6---------7---------8---------9---------10

(No Anxiety) (Extreme Anxiety)

Anxiety about *peers (friends/classmates):*

0---------1---------2---------3---------4---------5---------6---------7---------8---------9---------10

(No Anxiety) (Extreme Anxiety)

Anxiety about *community activities (Girl Scouts/Boy Scouts, 4-H, Church, etc.):*

0---------1---------2---------3---------4---------5---------6---------7---------8---------9---------10

(No Anxiety) (Extreme Anxiety)

Anxiety about *work (if you work):*

0---------1---------2---------3---------4---------5---------6---------7---------8---------9---------10

(No Anxiety) (Extreme Anxiety)

Adapted from Haygeman, E. (2015). *An adaptation of the Mindful Schools curriculum for adolescents: Feasibility and preliminary effectiveness on stress and mindfulness of adolescents in a public school setting* (Doctoral dissertation proposal).

APPENDIX H

RIGIDITY RATING SCALE (SELF REPORT)

Name: _____ Date:_____

1. I have a strong preference for routine.
1----------2----------3----------4----------5----------6----------7
Strongly Disagree Strongly Agree

2. I have a difficult time transitioning from one thing to another.
1----------2----------3----------4----------5----------6----------7
Strongly Disagree Strongly Agree

3. I try the same approach to a problem again and again even if it is not working.
1----------2----------3----------4----------5----------6----------7
Strongly Disagree Strongly Agree

4. I do things in a certain way or until they are right.
1----------2----------3----------4----------5----------6----------7
Strongly Disagree Strongly Agree

5. I become upset about minor changes.
1----------2----------3----------4----------5----------6----------7
Strongly Disagree Strongly Agree

6. I often view situations or problems as black and white.
1----------2----------3----------4----------5----------6----------7
Strongly Disagree Strongly Agree

7. I have a strong need for sameness.
1----------2----------3----------4----------5----------6----------7
Strongly Disagree Strongly Agree

8. I like things to stay in the same place.
1----------2----------3----------4----------5----------6----------7
Strongly Disagree Strongly Agree

9. I have trouble adapting to new places, situations, or people.
1----------2----------3----------4----------5----------6----------7
Strongly Disagree Strongly Agree

10. I like when things are predictable.
1----------2----------3----------4----------5----------6----------7
Strongly Disagree Strongly Agree

APPENDIX I

RIGIDITY RATING SCALE (PARENT REPORT)

Name: _____ Date:_____

1. **My child has a strong preference for routine.**
   1----------2----------3----------4----------5----------6----------7
   Strongly Disagree Strongly Agree

2. **My child has a difficult time transitioning from one thing to another.**
   1----------2----------3----------4----------5----------6----------7
   Strongly Disagree Strongly Agree

3. **My child tries the same approach to a problem again and again even if it is not working.**
   1----------2----------3----------4----------5----------6----------7
   Strongly Disagree Strongly Agree

4. **My child does things in a certain way or until they are right.**
   1----------2----------3----------4----------5----------6----------7
   Strongly Disagree Strongly Agree

5. **My child becomes upset about minor changes.**
   1----------2----------3----------4----------5----------6----------7
   Strongly Disagree Strongly Agree

6. **My child often views situations or problems as black and white.**
   1----------2----------3----------4----------5----------6----------7
   Strongly Disagree Strongly Agree

7. **My child has a strong need for sameness.**
   1----------2----------3----------4----------5----------6----------7
   Strongly Disagree Strongly Agree

8. **My child likes things to stay in the same place.**
   1----------2----------3----------4----------5----------6----------7
   Strongly Disagree Strongly Agree

9. **My child has trouble adapting to new places, situations, or people.**
   1----------2----------3----------4----------5----------6----------7
   Strongly Disagree Strongly Agree

10. **My child likes when things are predictable.**
    1----------2----------3----------4----------5----------6----------7
    Strongly Disagree Strongly Agree

On the back, please feel free to include other behaviors that you have observed your child engaging in, and rate those behaviors on a similar scale.

11. Other:

1----------2----------3----------4----------5----------6----------7

Not Severe Very Severe

12. Other:

1----------2----------3----------4----------5----------6----------7

Not Severe Very Severe

13. Other:

1----------2----------3----------4----------5----------6----------7

Not Severe Very Severe

14. Other:

1----------2----------3----------4----------5----------6----------7

Not Severe Very Severe

15. Other:

1----------2----------3----------4----------5----------6----------7

Not Severe Very Severe

APPENDIX J

CHILD AND ADOLESCENT MINDFULNESS MEASURE (CAMM)

Child and Adolescent Mindfulness Measure (CAMM)

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 is true for you.**

	Never True	Rarely True	Some-times True	Often True	Always True
1. I get upset with myself for having feelings that don't make sense.	0	1	2	3	4
2. At school, I walk from class to class without noticing what I'm doing.	0	1	2	3	4
3. I keep myself busy so I don't notice my thoughts or feelings.	0	1	2	3	4
4. I tell myself that I shouldn't feel the way I'm feeling.	0	1	2	3	4
5. I push away thoughts that I don't like.	0	1	2	3	4
6. It's hard for me to pay attention to only one thing at a time.	0	1	2	3	4
7. I get upset with myself for having certain thoughts.	0	1	2	3	4
8. I think about things that have happened in the past instead of thinking about things that are happening right now.	0	1	2	3	4
9. I think that some of my feelings are bad and that I shouldn't have them.	0	1	2	3	4
10. I stop myself from having feelings that I don't like.	0	1	2	3	4

Greco, Baer, & Smith (2011)

APPENDIX K

INFORMATION AND SCREENING SCRIPT

Information and Screening Script (for parents)

Adapted from Haygeman, E. (2015). *An adaptation of the Mindful Schools curriculum for adolescents: Feasibility and preliminary effectiveness on stress and mindfulness of adolescents in a public school setting* (Doctoral dissertation proposal).

"Thank you for your interest in the *Mindful Moments for Teens: Living with Stress in a Hectic World* group. I am going to ask you questions, tell you a little bit about the group, and then we will have time to address any questions you may have.

To begin, please answer the following questions:
Is your adolescent between the ages of 11 years, 6 months and 17 years old?

- If YES, continue.
- If NO, inform that they do not meet criteria for the group and offer waitlist option.

Does your child have a documented autism diagnosis, such as ASD, Asperger's Syndrome, Autistic Disorder, or PDD-NOS?

- If YES, continue.
- If NO, inform that they do not meet criteria for the group and offer waitlist option.

Has your child ever been diagnosed with an intellectual disability or received special education services under an educational classification that denotes intellectual disability?

- If YES, inform them that they do not meet criteria for the group and offer waitlist option.
- If NO, continue.

Has your adolescent ever participated in a group-administered mindfulness intervention in the past?

- If NO, continue.
- If YES, ask if they would like to be put on the wait list for future groups that are not a part of the current research study.

This group is offered to adolescents with autism. The group is designed to teach mindfulness techniques that have been shown in the research to decrease stress and anxiety and improve emotional well-being. Mindfulness is often described as moment-to-moment, non-judgmental awareness. It allows us to be more present and alert. The mindfulness techniques we will practice during the group include activities such as seated meditation, walking meditation, and heartfulness, which encourages gratitude. We will also practice mindfulness in everyday activities such as eating or having a conversation, and will have discussions about mindfulness and how it can have an effect in our lives.

Because this is a research study, we will need to collect some information from you and your teen before, during, and after group participation. The intervention group will meet for 9 weeks total, with additional meetings both before and after the intervention in order to collect data. So, you will be expected to come to the Autism Spectrum Disorder Clinic a total of 11 times. The class will meet once a week for 1.5 hours. The first of the eleven meetings will involve an orientation and an opportunity to fill out questionnaires.

Are you able to make the commitment to attend the 9 group meetings and the two additional data meetings at the Autism Spectrum Disorder Clinic?

- If YES, place their name on the list.
    - "Thank you for your interest in having your teen participate. We will be calling you soon to set up a time for you to come in to go over the details of the study and have you complete necessary screening measures and questionnaires. Do you have any questions about the study right now?"
- If NO, ask about barriers to group meeting. Ask if they would like to be put on the wait list for future groups.

APPENDIX L

DEMOGRAPHIC AND BACKGROUND QUESTIONNAIRE

Demographic and Background Questionnaire

Adapted from Haygeman, E. (2015). *An adaptation of the Mindful Schools curriculum for adolescents: Feasibility and preliminary effectiveness on stress and mindfulness of adolescents in a public school setting* (Doctoral dissertation proposal).

Person completing this form:

( ) Mother ( ) Father ( ) Other _____

Parent Relationship Status:

( ) Single parent ( ) Married, living together ( ) Married, separated

( ) Divorced, single ( ) Divorced, remarried ( ) Living together, unmarried

In terms of race/ethnicity, which of the following do you most identify with?

( ) White/Caucasian
( ) African American
( ) Hispanic/Latino
( ) Native American
( ) Asian American
( ) Other: _____

In terms of race/ethnicity, which of the following do you most identify for your teen?

( ) White/Caucasian
( ) African American
( ) Hispanic/Latino
( ) Native American
( ) Asian American
( ) Other: _____

How many years of formal education have you completed?

( ) Less than high school ( ) High school/GED ( ) Some college or trade school

( ) Graduated college Please list all degrees earned:
_____

How familiar are you with the practice of "mindfulness"?
( ) Not familiar at all/ No knowledge of the practice
( ) Somewhat familiar/ Have some knowledge of the practice

( ) Familiar/ Have knowledge of the practice
( ) Very familiar/ Have in-depth knowledge of the practice

If you marked "Somewhat familiar," "Familiar," or "Very familiar," on the above question, please answer the following questions:

How did you learn about mindfulness?
( ) News article or television
( ) Counselor or therapist
( ) As a participant in a mindfulness group
( ) Through a friend or family member
( ) Other _____

How often do you practice mindfulness yourself?
( ) Never
( ) Occasionally (At least once a month)
( ) Often (At least once a week)
( ) Almost every day
( ) Other _____

How did you hear about our group?
( ) Flyer/advertisement
( ) Website/social media
( ) Utah Parent Center
( ) Local autism organization
( ) Counselor, teacher or, staff at my student's school
( ) Other _____

Have you or your spouse been diagnosed with any psychiatric diagnoses (ADHD, Anxiety, Mood Disorder, Bipolar Disorder, Depressive Disorder, Autism, etc.)?
( ) Yes
( ) No

If (Yes), Please list the diagnosis/diagnoses:

_____

_____

_____

_____

Participating Teen Information

Name: _____ Nickname/Goes by:_____

Date of birth: _____ Sex: M or F Grade in school: _____

1. **Has your teen learned mindfulness before?**
   ( ) Yes
   ( ) No

   If (Yes), Please describe the activity:

   _____

   _____

   _____

   _____

2. **Has your teen been diagnosed with any psychiatric diagnoses (Autism, ADHD, Anxiety, Mood Disorder, Bipolar Disorder, Depressive Disorder, etc.)?**
   ( ) Yes
   ( ) No

   If (Yes), Please list the diagnosis/diagnoses:

   _____

   _____

   _____

   _____

3. ***In the past*, has your teen participated in counseling or therapy?**
   ( ) Yes
   ( ) No

   If (Yes), Please describe the type of therapy and duration of therapy:

   _____

   _____

   _____

   _____

4. ***Currently*, does your teen participate in counseling or therapy?**
   ( ) Yes
   ( ) No

   If (Yes), Please describe the type of therapy and duration of therapy:

   _____

   _____

5. ***In the past*, has your teen taken any medications for psychological symptoms (such as depression or anxiety)?**
   ( ) Yes
   ( ) No
   If (Yes), Please describe below:

   _____

   _____

   _____

   _____

6. ***Currently*, is your teen taking any medications for psychological symptoms (such as depression or anxiety)?**
   ( ) Yes
   ( ) No

   If (Yes), Please describe below:

   _____

   _____

   _____

   _____

7. **During a few of the lessons, we will practice easy "mindful movement" practices that are similar to simple yoga. Does your teen have any physical disabilities of which we should be aware?**
   ( ) Yes
   ( ) No

   If (Yes), Please describe below:

   _____

   _____

   _____

   _____

8. **We will be giving out snacks towards the end of each group session. Please note any diet restrictions your teen may have:**

   _____

   _____

APPENDIX M

PARENT INFORMATION

Mindful Moments for Teens: Living with Stress in a Hectic World
Parent Information Sheet

Adapted from Haygeman, E. (2015). *An adaptation of the Mindful Schools curriculum for adolescents: Feasibility and preliminary effectiveness on stress and mindfulness of adolescents in a public school setting* (Doctoral dissertation proposal).

Rationale for the Group:
Research has shown that adolescence is a time of increased stress. The most recent edition of the Stress in America Survey™, conducted by the American Psychological Association (APA, 2014), found that teens are experiencing levels of stress that meet or exceed that of adults. Stress increases the likelihood of experiencing anxiety symptoms, particularly for those with autism. Additionally, most teens have less solidified coping skills as compared with adults and report needing help managing their stress and anxiety.

Research in the area of mindfulness interventions has been promising. Researchers have found that a mindfulness practice can decrease stress, anxiety and depression, enhance immune function, decrease need for medication, increase motivation to make changes, and improve sleep quality. In addition, research with children and teens has reported improvements in working memory, attention, academic skills, social skills, emotional regulation, and self-esteem, as well as improvements in self-reported mood.

What is Mindfulness?
The following definition and description of mindfulness is borrowed, with permission, from www.mindfulnessutah.com.

"Often described as moment-to-moment, non-judgmental awareness, mindfulness offers us a lens through which to experience our lives in a more present, alert, and gentle way. One might say it is a way of life that cultivates our capacity for sharpening the mind and opening the heart.

In his book *Wherever You Go There You Are*, Jon Kabat-Zinn wrote: 'This kind of attention nurtures greater awareness, clarity, and acceptance of present-moment reality. It wakes us up to the fact that our lives unfold only in moments. If we are not fully present for many of those moments, we may not only miss what is most valuable in our lives but also fail to realize the richness and the depth of our possibilities for growth and transformation.'

The busy pace of our lives holds us captive from ourselves and others in our lives. Even the beauty of a sunset or our child's laughter can be lost on us. When was the last time you were able to give a thoughtful, honest answer to the question "How are you doing?" Running from one place to the next, working down the "to do" list, we keep up the pace until we feel exhausted, overwhelmed, out of balance, and out of touch.

Mindfulness practice offers us a way to relate directly to what we are feeling in our bodies, hearts, and minds with gentleness, curiosity, and compassionate awareness. All that we encounter in our lives – the stress, the pain, the pressures of daily life – can be experienced through this lens of mindfulness. As a result, we may feel many positive

benefits and a general sense of wellbeing and balance."

What to Expect from this Class:
This class uses a curriculum called *Mindful Schools*, which was developed in Oakland, CA. The curriculum consists of 15-min lessons originally designed to be delivered over 18 weeks. This class at the Autism Spectrum Disorder Clinic will build on those lessons in a small group-based format delivered for 1.5 hours a week over 9 weeks. More information about *Mindful Schools™* can be found here: http://www.mindfulschools.org.

In this class, your teen will work with mindfulness practices that have been shown to decrease stress and anxiety and improve emotional well-being. Each week they will learn a new technique, practice in a supportive group environment, and discuss stress and coping skills.

With regular mindfulness practice, your teen may choose to engage in some introspection or quiet times during the next nine weeks. Please allow them to do so. Looking inward can, at times, cause one to reflect on one's emotions and experiences. Depending on the particular emotion or experience, this can be a pleasant or unpleasant experience. Please allow your teen the freedom to be "in the moment" with whatever they are feeling. Of course, if there are changes or concerns that arise during the group or as a result of the group, please let us know (contact information below).

How You Can Help:
We will be asking participants to commit to a daily practice of the techniques learned during group. You can offer support in these areas:

- *Finding an appropriate place and time for the practices.* This is most effective if they choose a safe, calm place where they can get some peace and quiet (encourage other family members and siblings to give them space during this time). They can set up a cushion, blanket or chair where they feel comfortable. They may also choose to make the space "their own" by adding a candle or something special to them.
- *Gently reminding and/or checking in with them, rather than forcing them to do the practices/homework.* We have found that it is most helpful to be gently supportive in your reminders to do the homework. If your teen chooses to do the homework, great. If not, and you choose to remind them, gently remind them once. If they choose to not do it, it is not your job to force them to. We will talk about barriers to practice during the group itself.
- *Practicing yourself* ☺ The best way to support your teen in this practice is to model some mindful practices yourself. This can simply mean a commitment to being "more present" in your conversations with your teen. It can also mean practicing some mindfulness techniques yourself. Below are some suggestions for building your own practice. Feel free to email us for more information!

Resources for Mindfulness Practice:

- Building a mindfulness practice for yourself can be a great way to support your teen during the next nine weeks. Here are some helpful resources for adults:

- http://marc.ucla.edu/body.cfm?id=22 -- This website through the University of California Los Angeles (UCLA) offers free guided meditations for home practice.
- http://mindfulnessutah.com/~mindful/community-resources/ -- This website offers a good description of what we mean when we say "mindfulness" in this group. It lists local classes and offers resources about mindfulness.

Weekly Class Schedule:

- Check-in with group (stress level, mindfulness practice)
- Centering with bell
- Review of the previous week's lessons
- Lesson 1
  - Includes Teaching, Practice, and Discussion/Journaling
- Break and Snacks
- Centering with bell
- Lesson 2
  - Includes Teaching, Practice, and Discussion/Journaling
- Wrap up discussion/ Review of homework expectations

What to Bring:

Snacks will be provided each week. Please encourage your teen to bring the following to class each week:

- Water bottle
- Cushion or pillow to sit on
- Journal (additional paper will be provided as needed)

Any questions or concerns during the week? Please contact us.
Email: xxxxx@xxxxx.xxx

APPENDIX N

GROUP PARTICIPANT EXPECTATIONS

Mindful Moments for Teens: Living with Stress in a Hectic World

What to Expect from this Class:

In this class, we will work with mindfulness practices that have been shown to decrease stress and anxiety and improve emotional well-being. Each week we will learn a new technique, practice together, and have discussions. At first the techniques may not seem easy, but stick with it and see how it goes for you!

Expectations:

- Our goal is to create a safe atmosphere in this group. In order to do so, here are our expectations:
  - What is said in group stays in group
  - Listen to others, do not interrupt
  - Stay positive, no putdowns
  - Keep cell phone silenced and put away
  - There will be a small amount of homework. Homework is to do 10 minutes daily of mindfulness practice on your own.

Weekly Class Schedule:

- Check-in with group (stress level, mindfulness practice)
- Centering with bell
- Review the previous week's lessons
- Lesson 1
  - Includes Teaching, Practice, and Discussion/Journaling
- Break and Snacks
- Centering with bell
- Lesson 2
  - Includes Teaching, Practice, and Discussion/Journaling
- Wrap up discussion/ Review of homework expectations

What to Bring:

Snacks will be provided each week. Please bring the following to class with you:

- Water bottle
- Cushion or pillow to sit on
- Journal or notebook for reflection (paper will be provided as necessary)

Any questions or concerns during the week? Please contact us.
Email: xxxxx@xxxxx.xxx

Adapted from Haygeman, E. (2015). *An adaptation of the Mindful Schools curriculum for adolescents: Feasibility and preliminary effectiveness on stress and mindfulness of adolescents in a public school setting* (Doctoral dissertation proposal).

APPENDIX O

OLIN LEVITT'S ABC TECHNIQUE

Mindfulness in the Moment

The ABC Technique

R. Olin Levitt, Ph.D., R.Y.T.

"Between stimulus and response there is a space. In that space is our power to choose our response. In our response lies our growth and our freedom." (Viktor E. Frankl)

This set of integrated tools was inspired by the above quote and is a means by which one may create the "space" in which our "power to choose" exists. The technique has been successfully used in a multitude of settings by a variety of populations from preschoolers to adults. It can be practiced whenever one feels stress/anxiety/worry rising up in the body and mind.

A = **A** Mindful Breath
B = **B**oth Words and Tapping
C = **C**hoose Wisely

A Mindful Breath helps dissipate stress in the body and mind. It could be defined simply as a breath that is paid attention to. No conscious attempt is made to manipulate the breath in any way. One may find, however, that directing attention inward often results in a deeper and longer breath. This technique creates a little space, helps one soften into the stressful experience, and soothes the nervous system in remarkable ways.

Both Words and Tapping is a method of grounding/centering oneself and sets the stage for skilled decision-making (via the prefrontal cortex) by coordinating a positive, four-beat phrase with the tapping of all four fingers on each hand. The finger tapping can be done on the sides or backs of the legs (while standing) or top of the legs (while seated). Prior to the tapping, the thumbs (i.e., "anchors") are brought into contact with the body, leaving the four remaining fingers of each hand slightly off the body and free to move. As the phrase is spoken, mentally, the fingers, beginning with the two index fingers, are brought into contact with the body and are left there to rest. When finished, both hands are flat on the body, which has a warm and soothing effect, similar to a hug. With practice, this technique can be done quickly, subtly, and privately.

Some examples of four-beat phrases:

- "I am here now."
- "I can do this."
- "I am ok."
- "I can be here."

- "I'm a calm lake."
- "I have a choice."
- "I can choose love."

Choose Wisely is a powerful pointer and the final step in the series. It is an internal reminder that a conscious and humane response is available in any stressful situation. A wise choice could be defined as one that benefits both oneself and others. Given this, a wise choice could be said to be a nonviolent, loving choice. It is important to understand that a wise choice may take many forms, including silence.

Frankl, V. E. (1984). Man's search for meaning: An introduction to logotherapy. New York: Simon & Schuster.

The finger tapping technique was inspired by Jennifer Cohen Harper, founder of Little Flower Yoga (http://littlefloweryoga.com).

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