USE OF MODULAR THERAPY TO TREAT ANXIETY FOR SCHOOL AGE STUDENTS WITH AUTISM

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ABSTRACT

Autism spectrum disorder (ASD) is a neurological disorder characterized by challenges with social communication, interpersonal skills, sensory stimulation, and restricted and repetitive behaviors. Because of these challenges, the social demands of school can produce anxiety in some children with ASD. Although practitioners use several evidence-based interventions to treat autism, there are few that address the anxiety symptoms commonly associated with individuals with ASD. This study examines the extent to which perceived anxiety levels decrease for school-age children with autism who also present with anxiety-related concerns. It also examines the extent to which children with ASD rate the usefulness of the intervention, and parent and teacher satisfaction with the intervention. A modified version of the *Modular Approach to Therapy for Children with Anxiety, Depression, Trauma, and Conduct Disorders* (MATCH-ADTC) was adapted to include more visuals, schedules, and social stories. In addition, the researcher measured the effectiveness of the intervention by collecting data on the students' engagement (determined by the practitioner) and feedback on the students' experience (determined by the student).

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By

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In memory of my Grandpa William Glenn.

From a young age, you encouraged me to value my education. In particular, you always asked me to write stories for you to read. You went home before this one was complete, but this is for you. I thank God that you planted that seed and knew I could do it before I did.

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CHAPTER 1: INTRODUCTION & LITERATURE REVIEW

According to Individuals with Disabilities Act (IDEA) of 2004, children who qualify for special education supports and services under the autism category (IDEA, 2004) may exhibit problematic academic, behavioral, and mental health challenges in schools. Specific individualized educational programs address the academic and behavioral components of behavior, but seldom address the mental health behaviors commonly associated with their classification. Internalizing disorders include thoughts and behaviors related to emotional distress, life challenges, and trauma (Wergeland et al., 2021). Unlike externalizing disorders (acting out disorders) which are easier to operationalize and identify because of their behavioral topography, internalizing (acting in) behaviors are not often observable or measurable. The subtle nature of internalizing behaviors can make the classification of disorders a complex and arduous process. Identification of internalizing disorders can be especially difficult in children with autistic traits because some anxiety-related behaviors may present as autism-related behaviors (e.g., flapping, withdrawal, idiosyncratic fears). It is especially important that these students are identified and assisted by experts in autism and mental health services. School psychologists are highly qualified experts who assist general and specialized populations in academic, behavioral, and mental health services. Delivering an anxiety-focused intervention to school age students with ASD may lead to positive outcomes including student satisfaction, decreased reports of anxious feelings, and teacher and caregiver approval. The following literature review will present a rationale for this study and a review of current research in the areas of autism, anxiety, and school mental health intervention.

Advocacy for Mental Health Services for All Students

Growing research supports evidence that mental and psychological well-being positively correlated with academic performance (Agnafors et al., 2021; Halpern-Manners et al., 2016; Hanchon & Fernald, 2013). Therefore, in efforts to support students' overall well-being in schools, several organizations encourage school psychologists to provide comprehensive services which address not only academic and behavioral needs but also the mental and psychological well-being of students in schools. The National Association of School Psychologists (NASP) has a commitment to serving mental health supports to all students regardless of age, race, sex, gender, disability status, and cognitive level (NASP, 2020). Also, per NASP's professional ethics, professionals in school psychology are to promote student wellness (NASP 2010; NASP, 2014). Within the context of fairness and justice, Standard I.3.4 of the NASP (2010) ethics guidelines states that "school psychologists [must] strive to ensure that all children have equal opportunity to participate in and benefit from school programs and that all students and families have access to and can benefit from school psychological services" (p. 6). Court cases, such as *Wyatt v. Stickney* (1971), have also concluded that practitioners were responsible for such treatment (Bailey & Burch, 2016). In recent years, political leaders, activists, and practitioners have made multiple calls to action advocating for an increase of school psychologists to join multidisciplinary school teams and integrate mental health services into the school setting.

Legislative acts (i.e., the *Mental Health Awareness and Improvement Act of 2015*, the *Patient Protection and Affordable Act of 2010*, *Safe Schools Improvement Act of 2021*, and *Strengthening America's School Act of 1994*) have also opened the conversation of school psychologists becoming essential members of school-based mental health (SBMH) teams (Eklund et al., 2017). This team of professionals includes social workers, school counselors, and

school psychologists who collaborate with educators to solve the needs of children and assess how multiple systems (e.g., biological, psychological, and social) interrelate and impact a child's behaviors and well-being. Failure to address these issues, however, can result in poor social, emotional, behavioral, and academic (SEBA) outcomes (Weist et al., 2022). Thus, SBMH practitioners are encouraged to assist multi-tiered systems of support (MTSS) teams in the commitment of screening students in need of additional supports, using diagnostic measurements to determine present skills and deficits, monitoring progress to determine any improvements or gained skills, and ensuring implementation to assess the usefulness and effectiveness of the intervention (Eklund et al., 2017; Weist et al., 2022). MTSS is a preventative method of identifying students at risk of SEBA challenges. Positive behavioral intervention supports (PBIS) are part of the MTSS framework and aim to identify students at risk of emotional and behavioral concerns. Within the context of mental health supports, MTSS teams work together to provide positive behavioral supports to all children at the universal and preventive level (Tier 1). Students who exhibit further mental and behavioral difficulties receive supplemental Tier 2 group support along with other children who present with similar challenges and need of this level of support. If efforts to remediate risk at level 2 are unsuccessful, students are supported in a Tier 3 support, where they receive direct one-on-one therapeutic interventions (Eklund et al., 2017; Weist et al., 2022).

There are many families who may seek mental health supports, but may face challenges to receiving them (i.e., lack of access to transportation, health insurance, affordability, difficulties with work schedules, etc.). Public schools are designated locations where students have access to integrated support including education, mental health services, and transportation, making the school setting the most accessible location for mental health services (Hanchon & Fernald,

2013). According to national data, 13-20% of school-age children are diagnosed with a mental health disorder per year (NASP, 2015), and one in five adolescents display "significant symptoms of emotional distress" (Hanchon & Fernald, 2013). An estimated 70-80% of children who used mental health services received them using school-based mental health services in according to NASP (2015). This suggests that schools are not only a central location to receive supports, but that they are a critical place for the majority of students who have mental health needs. Students with unmet mental health needs are at greater risk of declining mental health (Furtado et al., 2018), developing other mental health issues/diagnoses (Quenneville et al., 2020), dropping out of school (Porche et al., 2011), and increasing suicidal ideation and attempts (Narmandakh et al., 2021). School psychologists must continue delivering mental health support to students to support their emotional well-being and success in school.

Barriers to Providing Mental Health Supports in Schools

NASP proposes a 1:500-700 school psychologist to student ratio; however, studies suggest that many practitioners serve two-to-four times the number of recommended students and that significant differences in the ratio of students-to-school psychologists exist across broad regions of the United States (Affrunti, 2022). Understaffed schools and a shortage of school psychologists contribute to the difficulty of providing comprehensive services to students. Despite advanced skills training, school psychologists have been assigned more primary roles in standardized psychoeducational testing and providing data and evidence to support a multidisciplinary team's decision to appropriately determine a child's educational needs over the past few decades (Eklund et al., 2020; Schroeder et al., 1987). Failed systems-level programs and limited school resources have impeded school psychologists' ability to expand their expertise in the school setting.

Although there are benefits to teachers understanding child behavior, SBMH experts are responsible for supporting teachers by addressing these mental health concerns with students. Teachers, whose primary role is to educate, are sometimes expected to provide mental health supports. As of 2018, there were approximately 30 programs in the United States that train educators on mental health disorders and how to identify and treat symptoms (Anderson et al., 2018). Because there are very few mental health- focused programs available, many teachers may lack the confidence, knowledge, and skills necessary to treat concerning behaviors. In addition, an increase in problem behaviors in the classroom may be a frustration for teachers and may impede the flow, pace, or ease of instruction. Thus, tacking on additional responsibilities and managing their own workload as a result of a mental health need can lead to burnout (Hester et al., 2020).

An interconnected systems framework (ISF) is a model used to promote MTSS and prevent challenging behaviors in schools. As a part of MTSS, schools aim to engage in positive behavior intervention supports (PBIS) at three levels (Weist et al., 2022). At the universal level, Tier one supports are intended to serve all students. The second tier is an additional level of support that addresses supplemental ways to increase emotional, and/or behavioral development. Lastly, the third tier is an intensive level of support for students who may benefit from more frequent services. An increase in the range of school psychological services is possible when MTSS, an integration of response to intervention (RTI) and positive behavioral intervention supports (PBIS), is implemented. RTI is a way to track the effectiveness of SEBA interventions by documenting baseline and intervention data over the course of time. Schools that successfully carry out MTSS with fidelity have been reported to experience less staff turnover, disciplinary referrals, and suspension rates (Weist et al., 2022).

Unfortunately, schools continue to struggle to gather the resources and personnel to identify at-risk students and successfully intervene in academic and behavioral areas at the early stages. The intention of Special Education is to provide specially designed instruction if it is necessary to make adequate progress in academic or behavioral areas; however, for many districts, it appears to be a default placement to meeting the child's needs before prior interventions have been placed or attempted. School psychologists are trained to support early universal, supplemental, or intensive interventions to reduce the number of inappropriate referrals to special education. According to the Individuals with Disabilities Education Improvement Act (IDEA), students should not be considered for special education services due to limited English language proficiency or lack of appropriate instruction (IDEA, 2004). Furthermore, it is suggested that appropriate referrals include a comprehensive assessment to understand the multiple layers of a child's profile (including their response to intervention, attendance, English proficiency, etc.). There is some controversy surrounding the "wait to be sure" method of intervening (i.e., MTSS, RTI), and "sooner the better" (i.e., test and place), but ultimately, researchers suggest that a reconstruction of current systems may be warranted to better conceptualize the needs of students (Park, 2020). This continues to be an issue for school districts who struggle to identify students in a systematic way. Thus, many school psychologists spend much of their time doing special education evaluations (Weist et al., 2022), especially when the student-to-school psychologist ratio is higher than the NASP recommendation (Farmer et al., 2021). With a rise in mental health conditions over the past few decades, there is growing concern that student psychological needs may increase while practitioners spend most of their time in eligibility meetings, testing sessions, and report writing. For this reason, school psychologists and mental health advocates have made multiple calls for action in efforts to

increase the number of school psychologists and their engagement with students' mental and psychological wellness (Hanchon & Fernald, 2013; NASP, 2014).

Anxiety: A Leading Mental Health Issue

Awareness of the interdisciplinary systems (i.e., biological, psychological, and social factors) involved in a child's life helps practitioners engage in data-based decision-making to support the child's mental and behavioral health (NASP, 2020). Anxiety disorders are among school-age children's leading mental health issues (Narmandakh et al., 2021). Anxiety symptoms are typically detected at an early age, but many children are not reported to receive treatment (Narmandakh et al., 2021). Narmandakh and colleagues (2021) suggest that failure to treat anxiety may lead to long-lasting symptoms that carry into adulthood. The NASP *Model for Comprehensive and Integrated School Psychological Services* states that school psychologists must be aware of biological, psychological, and social influences on a child's well-being (Domain IV; NASP, 2020). This biopsychosocial model is a common framework for understanding physical and behavioral health conditions (Borrell-Carrio et al., 2004). In short, this model suggests that there are multiple factors (i.e., biological psychological, and social/cultural) that impact a person's behaviors and actions. This approach contrasts the idea that one specific factor (e.g., family) is solely responsible for child outcomes. Instead, there are various protective factors and risk factors within multiple interdisciplinary systems that may influence a child's development.

Biological Components of Anxiety

Researchers suggest the most significant influence regarding anxiety risk is genetic predisposition (Murray et al., 2009). Genetic factors include neuropsychological, biological, and

hereditary components, which may lead to different physiological responses to a threat or stress (Jacob et al., 2011; Murray et al., 2009).

A large body of research suggests that genetics play a crucial role in anxiety inheritability. Genetic components such as abnormalities in temperament, inheritability, hormones, and gender differences may impact the risk for anxiety. Temperament involves inborn characteristics and mannerisms, which may be passed along and affect emotional responses (Jacob et al., 2011; Narmandakh et al., 2021). A child may naturally exhibit a slow-to-warm-up or shy attitude, which may present as an anxiety-related behavior. Inherited traits may also be passed down to children. Specifically, children with parents with anxiety are more likely to exhibit anxious behaviors (Murray et al., 2009). Hormonal changes also posit some challenges to problem behaviors related to anxiety. Children may experience increased appetite, mood swings, and withdrawal throughout their development which can contribute to the symptomology of an anxiety disorder (Jacob et al., 2011; Narmandakh et al., 2021). Lastly, in terms of gender differences, anxiety is reported to be more prevalent among girls than boys (Narmandakh et al., 2021).

In terms of neuropsychological components, the amygdala, located in the prefrontal cortical region of the brain, is an area that is often associated with behavioral inhibition and reticence (Bertocci et al., 2014; Sesso et al., 2021). Activation in the amygdala, thalamus, hypothalamus, and brainstem may initiate an anxiety-related response (e.g., freeze response). Also, the frontal lobe is associated with behavioral inhibition; specifically, the prefrontal cortex is highly related to emotional responses. Jacob et al., (2011) noted that vagal tone impacts emotional regulation. The vagal tone balances the sympathetic with the parasympathetic nervous system. Thus, people born with lower vagal tones tend to act out more emotionally than people

born with average vagal tones. Overall, chemical imbalances within the nervous system may impact the intensity and severity of anxiety symptoms.

Psychological Components of Anxiety

Some psychological factors may also affect a child's mental health. (Mooney-Doyle & Lindley, 2020). Physical health is another component of anxiety. Researchers found that family relations and coping skills were among the common psychological components of anxiety. Parental relationships can impact anxiety (Shepherd et al., 2018). On the one hand, parents who prohibit emotional expression may forge an internalized response. On the other hand, parents who display a supportive role in their child's emotional behaviors may encourage a more positive response. Additionally, parents who model non-anxious behaviors are reported to have less impact on a child's anxiety. Lack of coping skills can also impact a child's ability to recover from setbacks such as unexpected changes in a schedule (Helverschou et al., 2019).

Social Components of Anxiety

Social factors of anxiety include the environmental influences on a child's life (Murray et al., 2009). Many life events or circumstances can trigger a child's anxiety response. The COVID-19 pandemic is a recent and ongoing event that has induced widespread anxiety responses in many school-age children. For example, young students have experienced the death of loved ones, transitioned to multiple delivery modes of instruction, and were isolated from their peers (Brophy-Herb et al., 2022). The adverse effects of the pandemic continue to impact school-age children as they face the multifaceted challenges of their educational pursuit, social immersion, and acquisition/reintroduction of social etiquette after nearly three years. Other stressful life events may include socioeconomic status (SES), physical and sexual abuse, and other traumas, which may have long-lasting psychological and neurochemical-altering agents (Narmandakh et

al., 2021). Negative childhood experiences such as child maltreatment can cause psychological problems (Quenneville et al., 2020).

Evidence-based Anxiety Treatment

To prevent agonizing and dysfunctional long-term outcomes, researchers advocate for early interventions to address mental health needs (Narmandakh et al., 2021). Cognitive Behavioral Therapy (CBT), Coordinated Anxiety Learning and Management (CALM), Acceptance and Commitment Therapy (ACT), and the Modular Approach to Therapy for Children with Anxiety, Depression, Trauma, and Conduct disorders (MATCH-ADTC) are several evidence-based interventions aimed at treating anxiety or anxiety-related symptoms on (Lucassen et al., 2015; Roy-Byrne et al., 2010; Wampold et al., 2011). Although there are valid treatments for childhood anxiety, for certain subgroups of children it may be more difficult to detect and treat anxiety. Children with autism are one such group.

Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a neurodevelopmental disorder distinguished by poor social communication and interpersonal skills, hyper-focused interests, sensory stimulation, and restrictive and repetitive behaviors (Preece & Howley, 2018).

Clinical Diagnosis

According to the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition Text Revision (DSM-5-TR), criteria for ASD may be met if individuals exhibit the following characteristics:

> "deficits in social communication and social interaction (i.e., deficits in social-emotional reciprocity, nonverbal communicative behaviors, and developing, maintaining, and understanding relationships), and restrictive and repetitive patterns of behavior, interests,

and activities (i.e., stereotyped or repetitive motor movement, use of objects or speech; insistence of sameness or adherence to routines; highly restricted, fixated interests which are abnormal in intensity or focus; and hyper-or hypo-reactivity to sensory input or unusual interests). These behaviors must be present from a younger developmental age (e.g., prior to three years of age), and must cause a clinically significant impairment in social, occupational, or other important areas of current functioning. In addition, the behaviors cannot be better explained by intellectual developmental disorder [i.e., intellectual disability] or global developmental delay" (American Psychiatric Association, 2022).

A qualified professional may complete an evaluation and use the DSM-5 as a manual for diagnostic classification of ASD; however, public schools are not obligated by law to recognize an external diagnosis of autism as a disability that requires special services.

School Classification

While most schools are not responsible for providing a diagnosis of ASD, they reserve the right to provide services to students under the category of ASD so long as they meet IDEA's criteria as a student with a disability. Students do not need to have an outside diagnosis of ASD to be recognized as a student with ASD in schools. In order to receive services for a disability in schools, IDEA states that schools must first identify a student as having a disability. IDEA provides the following definition for a child with a disability:

"a child evaluated in accordance with §300.304 through 300.311 as having mental retardation, a hearing impairment (including deafness), a speech or language impairment, a visual impairment (including blindness), a serious emotional disturbance, an orthopedic impairment, *autism*, traumatic brain injury, and other health impairment, a Specific

> Learning Disability, deaf-blindness, or multiple disabilities, and who, by reason thereof, needs special education and related services."

Although ASD is included in this definition, not all students with a diagnosis of ASD are recognized as children with a disability requiring services. According to IDEA (2004), autism is defined as

> "a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, that *adversely affects a child's educational performance*. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences… Autism does not apply if a child's educational performance is adversely affected primarily because the child has an emotional disturbance"

IDEA (2004) places an emphasis on academic impact, which is one of the reasons an outside evaluation and diagnosis does not always guarantee services in schools. There must be an educational impact on children in which an ASD classification allows them to better access the curriculum. In addition to this definition, it must be determined by the school that the social impairment and restrictive/ repetitive behaviors significantly impedes a child's ability to access the curriculum:

> "If it is determined, through an appropriate evaluation under §300.304 through §300.311, that a child has one of the [other IDEA] disabilities, but only needs a related service and not special education, the child is not a child with a disability under this part."

In other words, outside evaluations do not generally guarantee services in schools. Some districts may place more strict criteria, but in most cases, it is not necessary for students to have received

a prior diagnosis of ASD so long as there is an educational impact which necessitates access to specially designed instruction.

In general, ASD involves complexities in the brain, which may impact cognitive levels and ease of learning. ASD symptoms differ from many other disorders in that they exist on a spectrum because the symptoms of autism vary by individual. For example, although one person with ASD may experience poor communication skills, high sensory needs, and multiple restrictive and repetitive behaviors, another person with ASD may struggle with understanding appropriate social boundaries and exhibit few sensory needs. Despite these differences, many individuals with ASD generally tend to experience some level of difficulty in social interactions due to neurological complexities coupled with their attentiveness to details and difficulty with perspective-taking and change (Bauer et al., 2022). Because ASD symptoms may emerge at a young age, need for treatment can be detected as early as two-or-three- years of age (Yi et al., 2020).

ASD Treatment and Services

A few evidence-based treatments have been used by school psychologists, behavior analysts, and behavior therapists to treat some of the most prevalent and outstanding symptoms of ASD. In a key word search in ProQuest, google scholar, and a university library data base search, the key words “autism spectrum disorder AND evidence-based treatments” brought up several treatments used with children with ASD including applied behavior analysis, discrete trial training, social stories, and intensive language/communication skill building (Hungate et al., 2017; Yu et al., 2021; Virués-Ortega, 2010). In addition, organizations such as Autism Speaks, the National Autism Center (NAC) and International Society for Autism Research (ISAR)

provide families and important shareholders with resources that aid in the awareness, identification, and treatment for children with ASD (Hungate et al, 2017).

Depending on the need for services, some ASD services are delivered in public schools for free as a part of a Fair and Appropriate Public Education (FAPE). Children with symptoms of ASD may qualify for specially designed instruction if there is evidence that their symptoms interfere with their ability to access the curriculum. They may receive special education supports and services to target goals in social communication, interpersonal, independent living, and academic skills through an individualized education program (IEP) in a special education classroom. Goals on the IEP are typically changed (e.g., when data suggest little-to-no progress), modified (e.g., when data suggest adequate progress), or removed (e.g., when data suggest achieved goals) based on a child's progress or lack thereof. Some districts also employ behavior analysts to intervene and provide direct one-on-one services to students who require intensive assistance.

The Centers for Disease Control and Prevention (CDC) reported that one in every 54 children are diagnosed with ASD (CDC, 2022). The numbers are expected to increase as communities become more aware of diagnostic characteristics (Maenner et al., 2020). The increase in ASD diagnoses necessitates additional resources and behavioral supports for both families and persons with ASD. Unfortunately, research suggests that many members of the ASD community do not have access to educational, social welfare, and health-related resources due to issues on the systems level. Families may face a lengthy waitlist for services before (i.e., evaluation) and after (i.e., treatment) a diagnosis. Services can be expensive and may not always be covered by insurance. Families have also reported fatigue concerning the process of accessing ASD specialists. Despite the various type of evidence-based interventions, due to the

complexities involved with accessible resources, many families have expressed dissatisfaction with the level of care provided following a diagnosis of ASD (Yi et al., 2020).

It is important to note the need for follow-up regarding progress monitoring of symptoms. Annual pediatrician check-ups are commonplace for families with health insurance, transportation access, and the monetary means to pay for an appointment. However, researchers have found that annual doctor check-ups typically consist of broad screeners specific to developmental milestones and general concerns. Additionally, parents are limited to a particular time frame for their appointment, which may restrict the breadth of conversation and accurate explanation of symptoms. Vague measures, time constraints, and difficulty discerning symptoms may impact health care providers' ability to recommend appropriate service referrals. (Yi et al., 2020).

Anxiety and ASD

Anxiety-related concerns with ASD may be challenging for parents to detect because of the complex nature of ASD. The concerns of parents include problematic recurring symptoms, skill regression, and emerging symptoms. Children born with neurological disorders, such as ASD, may have a specific set of needs that may make problematic behaviors difficult to recognize, manage, and/or treat. Thus, as children develop, behaviors of concern may raise questions about comorbidity or co-existence with other disabilities (e.g., Intellectual Disability [ID], Attention-Deficit/Hyperactivity Disorder [ADHD], Obsessive Compulsive Disorder [OCD], Post-traumatic Stress Disorder [PTSD], Generalized Anxiety Disorder [GAD]; (Lau et al., 2020). Of note is the comorbidity of ASD and anxiety. Researchers found that roughly 40% of children with ASD present with an anxiety disorder (Preece & Howley, 2018). Preece and Howley (2018) added that risk for anxiety among children with ASD is nearly three times the

risk of anxiety for neurotypical children (Preece & Howley, 2018). This study will focus on the overlapping symptoms of ASD and anxiety by teaching coping skills to improve students' emotional well-being and success in school.

The overlap in anxiety and ASD symptoms makes it difficult for researchers to distinguish autism-related anxiety from general symptoms of ASD (Preece & Howley, 2018). Difficulties with social skills and/or communication can present similarly with anxiety. Longitudinal research identified a transactional relationship between symptoms of autism (e.g., social communication) and anxiety. Researchers found that social communication difficulties may present greater risk for social anxiety for children (White et al., 2018). In terms of reinforcement history, it is important to note how certain social behaviors have been maintained amongst children with ASD. For instance, a child with autism may avoid social situations because such situations are not reinforcing, but punishing, decreasing the likelihood of their interactions with others in the future. A child with autism may also avoid social situations because social situations are anxiety-provoking due to a history of negative social experiences or poor development of social skills. In addition, restrictive and repetitive behaviors can also impair a child's ability to cope effectively with a challenging setback. Anxiety triggers, or situations that provoke an anxiety response, may differ between children with and without ASD. Within the community of individuals diagnosed with an anxiety disorder, it may be typical to experience anxiety in social situations (e.g., social anxiety), in test-taking environments (e.g., generalized anxiety), and in fearful situations (e.g., phobia). However, children with ASD may have idiosyncratic fears that are less common (e.g., green food, water sprouting from a shower head; Lau et al., 2020). In addition, Magiati et al., (2016) noted that some children with ASD may have anxiety-related triggers from sensory issues (e.g., bright lights, loud sounds). Unlike typically

developing children with anxiety, anxiety may also result from a change in routine for individuals with ASD. Many children must adhere to a specific schedule.

While there may be many similarities in symptoms of autism and anxiety, there some differences in the way anxiety can be presented for children with ASD. On the one hand, children with ASD may engage in stereotyped behaviors (e.g., flapping hands) because of some anxiety-provoking situations. In contrast, neurotypically-developed children may exhibit harder-to-detect symptoms (e.g., withdrawal, silence) when they experience anxiety. In general, children with ASD are more likely to engage in restricted and repetitive behaviors than neurotypical children. Problems may arise if a child's restricted and repetitive behaviors can impact their safety (e.g., head rocking, self-injurious behaviors). Researchers suggest that children with autism with sensory processing difficulties may be at greater risk for severe anxiety-related responses than children with less sensory-loaded needs (Lau et al., 2020). In addition, individuals with ASD have an estimated 11-85% chance of symptoms worsening over time relative to neurotypical children (Preece & Howley, 2018).

Developmental Model of Understanding Anxiety in ASD

In addition to the biological, psychological, and social factors involved with anxiety mentioned in a previous section, children with ASD may have different mechanisms for their anxiety. White and colleagues (2014) suggested that symptoms of ASD are commonly associated with anxiety because of the overlap with emotional regulation (ER) impairments. Individuals who exhibit ER can manage and control emotions associated with events and situations. In contrast, anxiety is a state of distress; commonly associated with emotional dysregulation (ED). It is not uncommon for children with ASD to display weak ER skills, and thus, trigger a strong physiological or behavioral response.

Physiologically, individuals with ASD are reported to experience elevated levels of arousal. This suggests that the amygdala, thalamus, and parietal lobes are more frequently activated relative to neurotypical children. When the sympathetic nervous system is stimulated, anxiety responses (e.g., flight, freeze) are more likely to ensue. Regarding socio-cognitive components, children with ASD may not correctly identify contextual situations: They may struggle to demonstrate perspective taking, interpret facial expressions, understand subtle cues/sarcasm, express their emotions, and maintain eye contact. Failure to appropriately respond to social contexts can lead to negative reactions, such as withdrawal, a common symptom of ASD. Unlike neurotypical children who may demonstrate an ability to develop emotional recognition, neurodiverse children may have trouble in developing those ER skills which may lead to greater risk of anxiety (White et al., 2014).

Cognitive Behavioral Therapy

Cognitive behavioral therapy (CBT) is a form of treatment that aims to restructure thinking patterns for people who experience maladaptive thoughts. CBT comprises of a cognitive triangle that primarily focuses on the relationship of one's thoughts, feelings, and actions. Within the framework of CBT, clinicians emphasize that situations may provoke certain thoughts, which could bring about specific feelings, which may impact our behaviors. In general, CBT requires a level of advanced thinking. According to Lickel et al. (2012), CBT not only requires the skill of being able to recognize emotions, but also to correctly identify and discriminate between emotions. This typically will require the use of verbal (i.e., expressive and receptive) language skills. Thus, in addition to cognitive components, CBT also involves linguistic prerequisite skills. In order for treatment to be effective, a learner must obtain an understanding of the language used to make meaning of the language used in therapy (receptive skills). Likewise, CBT may

also require a participant to express their understanding as a baseline, and progress monitoring tool to determine advancement of skills and progress towards goals (Bhide & Chakraborty, 2020). This includes the ability to self-reflect, express awareness of their own thoughts and beliefs so that they could acknowledge and challenge some of their unhelpful thinking as a necessary component of CBT.

Research on Therapy for Students with ASD

Researchers have studied the effects of interventions on children with autism for many years. For example, Ben-Itzchak and Zachor (2007) discovered autistic children with high expressive and receptive abilities and high cognitive levels made significant progress in reaching their behavioral goals. A controlled trial study invited fully verbal and vocal autistic children with average IQ scores to participate in CBT treatment. Those students experienced significant decreases in anxiety symptoms when provided with CBT treatment (Chalfant et al., 2012). Findings from a long-term study also followed up on the anxiety symptoms of autistic individuals revealed that students who were able to verbally participate in CBT continued to experience a reduction in anxiety symptoms after one year of treatment (White et al., 2015). Other researchers modified CBT curricula to meet the unique needs of children with autism who presented with anxiety and indicated positive outcomes and a reduction in anxiety symptoms among autistic children who required minimal supports (Reaven et al., 2012).

Modular Therapy and ASD

A modular approach to treatment is a comprehensive method of incorporating various overlapping effective strategies (Bovin et al., 2016). Assessing the intensity of a student's feelings, exposure therapy, and goal setting are some of the elements included in sessions. MATCH-ADTC is a CBT treatment that includes several evidence-based concepts used in CBT

into one modular manual. It incorporates cognitive restructuring by gradually exposing children to fear-inducing situations so that they can more easily overcome their fears. School psychologists are among the qualified professionals to use MATCH-ADTC to treat anxiety, depression, trauma, and conduct disorders for children 7-14 years of age. It is possible that a modular approach may be appropriate for children with ASD who display anxious behaviors because the model incorporates some of the most effective techniques to treat anxiety.

Children with autism may struggle to adhere to changes in routine, and students with autism typically thrive in a more structured setting because it provides a sense of predictability for the child and prepares them for what to expect. The MATCH-ADTC is a structured manual that provides a typical routine for each session. Each session begins with a rating on the fear ladder, a review of what was discussed the last session, a review of homework, and then didactics for the new skill. To further structure each session, the therapist can provide a checklist of what to expect during the session that the student can mark as they progress throughout the session.

Typically, IEPs for students with ASD include academic and behavioral goals which sometimes include mental health goals (e.g., for internalizing problems). This is especially important as mental health goals can support increased access to educational progress. There is evidence to suggest that CBT has not only been used with children with autism (Kalvin, 2021; Scattone & Mong, 2013; Spain & Happe, 2019), but also other forms of CBT (e.g., music therapy) have been found effective for children with ASD (Kern & Humpal, 2013; Ruiz et al., 2023). In addition, techniques commonly used in CBT sessions (e.g., breathing techniques, mindfulness) have been helpful for children with disabilities to improve their quality of life

(Drüsedau, 2021; Ridderinkhof, 2021) and decrease negative feelings and rumination (de Bruin, 2015; Ridderinkhof, 2021).

Given the effective nature of modular therapy and the research to support the success of CBT with autistic youth, there should be more inclusive efforts to provide modular treatments for the ASD community. In doing so, it is important to consider appropriate modifications (i.e., more visuals, visual schedules, explanations, and social stories) to ensure understanding of treatment. There are also no known successfully implemented anxiety interventions involving children with ASD that have a moderate, severe, or profound diagnosis of an Intellectual Disability (ID). Students with a moderate, severe, or profound ID may lack the cognitive or verbal skills to understand the intricate components of emotional recognition and awareness (which include perspective taking, identification of emotions, understanding of nonverbal cues, etc.), as well as the adaptive skills to apply and practice the skills in their life. Therefore, instead of using traditional CBT, individuals with intellectual disabilities may benefit from other behavior-focused interventions which address targeted skills that are helpful for building their independence and flexible thinking (e.g., communicating a need in an appropriate manner, learning how to waiting, accepting "no", coping from a setback). For individuals without ID, CBT may be more in line with their cognitive and verbal abilities. Because adolescents also face a greater risk of anxiety-related behaviors (Hanchon & Fernald, 2013), it is expected that school age students with ASD and mild or no ID may benefit from modular-based anxiety treatment.

Purpose of this Study

Traditionally, most elementary and secondary level IEPs include autism-related acquisition, maintenance, and generalization interventions including those geared towards social-communication, daily living, and behavior reduction. Program effectiveness is typically

determined by the child's ability to apply skills, achieve goals, and progressively acquire advanced skills. Although those outcome measures may be effective in evaluating students' success with interventions, they may not address other symptoms that are commonly associated with social challenges (e.g., internalizing behaviors). Although mental health support for the autistic community is growing, research still suggests that there is a need for continued resources to identify and treat school-age youth with ASD who are at-risk for anxiety (Hungate et al., 2017). Likewise, there is evidence that a modular therapy approach may be effective with this group of students (Ordaz et al., 2018). However, this approach has not been studied for use with students with ASD. Because ASD is a social communication disorder, anxiety symptoms are likely to emerge more frequently for students with ASD, given the social demands of the school climate. Thus, students with ASD with a dual diagnosis of anxiety are more likely to become disengaged in school, experience truancy, refuse tasks, act out aggressively, and/or drop out of school (Preece & Howley, 2018; Jackson et al. 2017).

The purpose of this study was to determine the perceived effectiveness and usefulness of modular therapy for treating anxiety for school-age children with ASD. Qualitative and quantitative data were used to determine the effectiveness of the treatment. Qualitative data was tracked biweekly during baseline and throughout the intervention. Quantitative data was also obtained to better understand each participant's opinion about the treatment, as well as to test their knowledge after having completed the intervention. Parents and teachers were also given pre- and post-intervention surveys to identify their perceptions on the usefulness of the intervention, as well as their likelihood to recommend it to other parents and teachers. This pilot study addressed the following questions:

1) To what extent do perceived levels of anxiety decrease for school age students with ASD while participating a modified version of the MATCH-A curriculum?
2) To what extent do school age students perceive the usefulness of this intervention in their lives?
3) How do the parents and teachers rate levels of satisfaction regarding modular therapy treatment and outcomes for these students?

CHAPTER 2: METHOD

Setting

School age students from a school district in a southeastern area of the United States were recruited to participate in this study. The primary investigator (PI) worked in the school district as a Graduate Assistant on a school-based mental health grant initiative. The PI was a trained school psychologist and was qualified to implement the intervention as a therapist delivering MATCH-A. Students aged 8-16 years with a medical diagnosis of ASD, and/or with an IEP under the IDEA category of autism, were invited to participate in this study. The sessions took place in an open/available room in the child's school. As a part of this research, each session lasted approximately 30-45 minutes. The treatment took place during their intervention period or "specials" time (e.g., library, art, music, technology).

Participants

Recruitment

To determine the risk for anxiety, students were nominated by the county mental health team. To provide some context of what anxiety may look like, the *Zones of Regulation* definition was used. The county adopted *Zones of Regulation* as a district-wide, Tier 1 intervention to capture students at-risk for externalizing or internalizing behaviors. Anxious behaviors were described to school personnel as behaviors in the "yellow zone." The yellow zone is defined as the moment when people's "internal state starts to elevate," and there is a need to "regulate to manage energy." In this zone, individuals may experience feelings that include stress, worry, excitement, frustration, nervousness, and confusion (Kuypers, 2011).

The district-wide mental health team derived a list of students with autism who exhibited frequent anxiety-related behaviors using MTSS documentation. These students were previously discussed in Tier 2 or Tier 3 meetings as "at-risk" due to behavioral observation (e.g., crying

after drop-off), student self-report (e.g., reported stomach pains/headaches, complaints about bad things happening, self-reported data from universal screeners), and/or other concerns reported by at least one teacher (e.g., student appeared nervous, seemed to worry about what others think). Once students were identified, the child and parent of the child completed research-based anxiety screeners to verify the fit for treatment.

Inclusion Criteria

Fully verbal students in the age range of 8-16 years with a diagnosis of ASD, or an IEP under the IDEA category of autism, were eligible to participate in this study. In addition, individuals whose Intelligence Quotient (IQ) scores fell within 1.5 standard deviations from the average IQ (i.e., IQ score of at least 77 or higher) were invited to participate. Specific criteria surrounding cognitive and verbal skills were determined based on what the research literature considers to be necessary components to understand and benefit from CBT (Likel et al., 2012). Eligible students needed to obtain a cutoff score of 25 on the anxiety symptom screener (SCARED) or a cut-off score of 24 from the SCAS-C/SCAS-P to receive one-on-one treatment in this study. Eligible students were also able to have other co-occurring diagnoses (e.g., Attention-Deficit/Hyperactivity Disorder) so long as the conditions did not impair their ability to comprehend higher-level thinking processes associated with CBT approaches.

Exclusion Criteria

The MATCH-Anxiety module is aimed to support the mental health of students by teaching them about anxiety, how their thinking patterns can change, and by providing coping strategies for when they feel anxious; however, deficits in cognitive and adaptive functioning could make the intervention difficult to understand. CBT emphasizes the use of metacognition, self-reflection, verbal ability, memory skills, and reasoning (Likel et al., 2012). In efforts to

avoid unnecessary harm, this study required students to obtain adaptive skills that were commensurate to cognitive functioning and suggestive of their ability to successfully engage in this level of CBT treatment. Therefore, students who did not demonstrate an ability to verbalize, assent, comprehend instructions, or engage in self-evaluation of their thinking patterns for CBT were excluded from this study. Students with a diagnosis of an Intellectual Disability (based on cognitive functioning and adaptive behavior deficits) were not included in the sample.

Final Sample

A total of six students were recruited to participate in this study. Among the individuals recruited were four elementary students, one middle school student, and one high school student. Although all six students were eligible based on diagnosis, parent ratings, and child assent, three students were not selected to move forward with the treatment due to barriers to intervention delivery. The parent of one elementary student required the child's registered behavior technician to join in the sessions; however, having a third party in the intervention room posed a risk to internal validity, as a decrease in perceived anxiety levels may have been impacted by the presence of a familiar adult. A middle school student did not participate in the study because he was unable to acknowledge areas for improvement or determine treatment goals for himself. From his perspective, he was not impacted by any fears or worries, and therefore, was not an eligible candidate for treatment. One elementary school student did not move forward in the study because he exhibited hyperactive and externalizing behaviors that resulted in multiple school suspensions and early dismissals that significantly impacted attendance and flow of the sessions. He struggled to attend to instructions within the therapeutic environment and appeared to better benefit from emotional regulation training.

Participants were recruited on a rolling basis (i.e., students were invited to participate throughout the school year and there was no specified cut off day until the study was complete). The study was complete after the minimum number of participants required for this study participated in pre-and post-intervention and completed pre-and post-intervention assessments. Ultimately, three students proceeded with the intervention and completed the pre-and post-intervention assessments. It should be noted that after receiving several MATCH-A interventions, one student noted that his anxiety significantly decreased and opted to graduate from the treatment without the need for exposure therapy (which was covered in the last 2 sessions). Given the interventions he received and completion of the pre-and post-intervention assessments, his data was interpretable as he completed the minimum requirements for this study. The participants' personal information was protected during this study. For research purposes, pseudonyms were used to protect the participant's identities. Co-occurring conditions and ages were included to provide context.

Measures/Dependent Variables

Anxiety Screeners

To identify potential fit for intervention, two measures were used to capture pre- and post-intervention symptoms of anxiety. The child and parent individually completed two screeners related to anxiety. Perceived anxiety symptoms were measured using parent and self-report that identified symptoms related to obsessive-compulsive problems, separation anxiety, social phobia, panic disorder, agoraphobia, generalized anxiety/overanxious symptoms, fears of physical injury, and other atypical fears.

The *Screen for Child Anxiety Related Emotional Disorders* (SCARED) is an anxiety screening tool for youth ages 6-18 years old (See Appendices A and B). The SCARED is a 41-

item Likert scale with moderately high reliability (Cronbach's alpha= .90). It comprises of statements related to five categories of anxiety: general anxiety disorder, separation anxiety disorder, panic disorder, social phobia, and school avoidance/phobia which correspond to the following responses: 0= "*not true/hardly ever true*", 1= "*somewhat true*/*sometimes true*", and 2= "*very/often true*" (Birmaher et al., 1999). The SCARED was normed on the general population; however, researchers have used this measure on children with ASD. Schiltz and Magnus (2021) recommend that if the SCARED is used for autistic children, that an additional follow-up measure is supplemented to capture autism-related anxiety (e.g., atypical fears).

In addition to the SCARED, the *Spence Children's Anxiety Scale* (SCAS) is a research-based screener that was used to assess anxiety levels that may be related to ASD for youth ages 7-19 years (Carruthers, 2018; Toscano et al., 2020). The SCAS is unique from other anxiety measures in that it focuses on children within the general population as well as those in the ASD community. The SCAS measures were developed by Susan Spence in 1997 for the child (SCAS-C; see Appendix C) and in 1998 for the parent version (SCAS-P; see Appendix D). The SCAS is a Likert scale that included 44 items with options that range based on frequency of symptoms: 0 = *never*, 1 = *sometimes*, 2 = *often*, 3 = *always*. It also included one open-ended question to give some context to potential autism-related fears (i.e., "Is there anything else that you/your child is afraid of"). Although there were no reported reverse coded items, there were six items that were positively worded which were eliminated from the scoring. The following items were not included in scoring: 11 (I am popular among other kids my own age), 17 (I like myself),26 (I am a good person), 31 (I feel happy), 38 (I like myself), and 43 (I am proud of my schoolwork). Higher scores indicated increased likelihood of an anxiety diagnosis consistent with the *Diagnostic and Statistical Manual of Mental Disorders*, *Fourth Edition* (DSM-IV), and the

cutoff score was 24. The SCAS' documented psychometric properties included a split-half reliability of 0.92 and moderate reliability overall (Cronbach's alpha= .80). The SCAS is also correlated (r= 0.73) with *the Revised Children's Manifest Anxiety Scale* (RCMAS; Spence, 1998; Toscano et al., 2020).

A reliable change index (RCI) was used to determine the any clinical significance of the pre-intervention ant post- intervention SCARED ratings. The RCI was calculated because this study's sample size was too small to generate a reliable effect size that could be representative of the general population. Therefore, the standard error of measurement (standard deviation) of each composite of the SCARED was used to calculate the reliability change index using a 90% confidence interval (z = 1.645). For purposes of this study, a reliability change index was considered "stable" if the RCI that was not clinically significant, but still resulted in a notable decrease in pre-intervention and post-intervention scores. An accelerating RCI was considered to be an RCI score that was not clinically significant, but that emerged as an increase in pre-intervention and post-intervention scores.

Intervention Usefulness Survey

The participants completed a pre-and post-intervention survey to determine their perceived usefulness of the intervention. The survey was a six Likert scale questions with options ranging from 0= *not at all*, 1= *maybe*/*unsure*, 2= *kind of*, and 3= *definitely* to understand their perspective and their perceptions of its use. A score of three was generally the most desired response for all questions except for one, which addressed current feelings of anxiety (in which case the desired response would be as close to 0 (or not at all) as possible).

Parent/Teacher Intervention Ratings

While the child's SCARED and SCAS ratings were used as pre-intervention data to identify perceived anxiety levels and fit for treatment prior to the start of the intervention, parents and teachers completed the *Therapy Evaluation Inventory* (TEI) to determine the perceived usefulness and acceptability of the treatment prior to intervention as well as after the intervention was complete (See Appendix F). The TEI is a 6-item scale designed to determine acceptability of treatment. It contains high internal reliability overall (Cronbach's alpha= .96) and higher scores indicate greater acceptability (*M*= 94.90, *SD*= 21.76; Newton, Nabeyama, & Sturmey, 2007). The TEI addresses an individual's thoughts of what *may happen* during the course of treatment. Items include: "How logical does this treatment to you seem?"), and responses range from 1 (*not at all logical)* to 9 (*very logical*); "How successful the treatment may be in improving quality of functioning?" and responses range from 1 (*not at all useful*) to 9 (*very useful*); "How confident would you be in recommending this treatment to a friend who experiences similar problems?" and responses range from 1 (*not at all confident*) to 9 (*very confident*); and "By the end of the course, how much improvement do you think will occur?" with 10 responses that range from 0% to 100%. This scale also addresses how they *feel* about the treatment. These items include the following: "How do you feel the course will help with functioning?" and responses range from 1 (*not at all*) to 9 (*very much*); and "By the end of the course, how much improvement in functioning do you feel will occur?" with 10 responses that range from 0% to 100%. Both parents and teachers completed these rating scales prior to treatment. The TEI is scored by obtaining the mean score of the items (i.e., adding all the items as a score of one, two, three, four, fix, six, seven, eight, nine, or ten; and dividing by six; Newton & Sturmey, 2004).

Behavioral Intervention Rating Scale (BIRS) was used to assess their overall satisfaction with the treatment by measuring acceptability, effectiveness, and time of effect. The BIRS is a 24- item rating scale that has high reliability (Cronbach's alpha= .97; Elliott & Treuting, 1991). The BIRS is a likert scale that includes six response options: "strongly disagree", "disagree", "slightly disagree", "slightly agree", "agree", and "strongly agree". The BIRS was scored by summing up all the items (Carter, 2009).

Procedure

Baseline Data & Activities

After the students completed the entire SCARED screener to identify anxiety levels, areas with the highest scores were monitored over time. For example, if a student scored highest in the area of separation anxiety, the student completed SCARED specific questions regarding separation anxiety. This shortened version of the SCARED was delivered twice a week during baseline and intervention. Students completed an anxiety fear ladder rating each week to determine their overall fear levels for the week. Both forms of data were collected to better identify a stabilized baseline (e.g., a student may have a particularly challenging week that impacts their overall anxiety level, but that may not impact their fears related to social anxiety which would be expected to be scored consistently). Nonconcurrent baseline durations were determined prior to this study and were pre-selected based on random assignment (Christ, 2007). Based on the selection, the first participant was randomly selected to received seven sessions of baseline; the second participant was randomly selected to receive five sessions in baseline, and the third participant was randomly selected to receive six sessions in baseline.

Rapport was established between the student and the therapist in the first few sessions (titled *Getting Acquainted-Anxiety*) prior to beginning the intervention. Different ice breakers

were tailored to set the ground for a strong therapeutic relationship. Sessions started out with card games (e.g., *Uno Flip* or *Phase 10*), drawing, or other games (e.g., *Tic Tac Toe, Connect Four*). Other forms of rapport building included a box of fidgets and sensory items. Preference assessments were completed to determine the client's preferred fidgets. They chose their favorite item(s), and any other preferred items. The students were given about two to five minutes to play with the item(s) and/or direct play with the therapist. During play, the therapist was able to learn more about why they chose the toy, what they felt while playing with the toy, and what they liked about it. This was helpful with understanding why certain objects may have brought comfort to the child as the item was later used during exposure therapy. In addition, the therapist primed the students by discussing feelings and emotions each session leading up to the intervention. The students gave examples about times in their week when they experienced various emotions (e.g., excited, happy, sad, nervous). The therapist also prepared the students for upcoming sessions by discussing the desired intervention goals. The fear thermometer was introduced and was also used weekly to teach the students how to rate their fears during treatment and to monitor progress with self-reported levels of anxiety.

MATCH-ADTC Intervention

The independent variable was the MATCH-Anxiety (MATCH-A) modules, which were delivered across eight sessions. The anxiety modules included rapport building, establishing a baseline level of worries using a "fear ladder," psychoeducation about anxiety/didactics that included cognitive restructuring and application techniques (i.e., practicing and maintaining) for coping strategies, in-vivo (live) exposure, and a concluding session. The dependent variable was the perceived levels of anxiety which were measured during each session using the anxiety thermometer. Handouts (provided in the MATCH- ADTC book) were used throughout the

intervention. Although the MATCH-ADTC was not developed for school-age children with ASD, modifications for this study were included. Specifically, additional materials were made available to tailor to the unique needs of the students (e.g., a visual schedule for the agenda, more visuals, social stories). In addition, students were able to play with a variety of sensory items throughout the session as well as during exposure therapy. For each session, the therapist shared a schedule of events, checked in about recent updates, reviewed previously learned material, checked the assignments, discussed new content, and ended on a positive note.

During the first session of this intervention (titled *Fear Ladder*), the student and therapist discussed ten fearful situations, sensations, or obsessions that ranged from minimal to extreme fear using ratings from the anxiety screeners as a frame of reference. For example, if the child rated a high-level fear in separation anxiety on the SCARED, a possible fear scenario may include being in a room alone. If the child indicated a fear of a ticking noise on the SCAS-C, a possible fear scenario may include being in a loud room with an analog clock. They developed a list of fearful scenarios to place on the fear ladder worksheet. The fear thermometer was used to help children differentiate levels of fear. A visual schedule was created to show the routine of events for each session.

During the second session (titled *Learning about Anxiety*), the therapist and student discussed advantages and disadvantages of anxiety. They discussed different examples of how to know when there is a real threat as opposed to a perceived threat. A social story was created to encourage the child to relate to the content, be a part of the narrative, provide context for what the treatment would be like, and give hope for the outcomes. Two of the three participants received a social story; however, the high school participant preferred to talk rather than use social stories. Following this session with the children, parents also met with the therapist to

discuss anxiety in an in-person one-on-one session for approximately one hour. In this session, parents were given psychoeducation about anxiety, how it may look, reasons why it may happen, and evidence-based strategies for handling anxiety at home. Parents were given an update on their child's goals and progress in the session. Helpful background information was shared during this session which helped give context to some of the students' anxiety. Parent sessions lasted approximately one and a half hours. Depending on preference, a hard or electronic copy of anxiety-related resources were shared with each parent towards the end of the session.

The third session (titled *Learning to Relax*) taught strategies about coping that they could try at home and school to prevent or minimize intrusive anxious thoughts. The participants took home a copy of the handout from the MATCH ADTC book to remember skills and practice them. Each student ranked the items that would be most helpful for them on a scale of 1-3. Students also used some of their preferred items in the sensory box to discuss which ones were most helpful for them. Participants discussed why the sensory item was useful and talked about other uses for the fidget in similar situations of fear or worry.

The next module was split up into two sessions (fourth and fifth sessions titled *Cognitive* ***S T O P***). The purpose of these lessons was to teach the student ways to recognize and address the feelings associated with fear. When **S**cared, a student may feel nervous, afraid, worried, and may experience a variety of symptoms (e.g., headache, stomachache). The student may also have many different **T**houghts of what may happen (e.g., good or bad). **O**ther thoughts may positively redirect the child to consider a favorable outcome. **P**raise is the final aspect which encourages the child to be proud of themselves for addressing the issue appropriately. A visually loaded worksheet from the MATCH handbook was provided for this session. Additional modifications were not required for this session. Preparation for the conclusion of services was provided.

During the sixth session (titled *Practicing*), the therapist and participant transitioned from didactics to in-vivo exposure. During this session, the participant was exposed to a fearful situation while engaging in the previously learned techniques. The participants used their preferred toys/sensory items from session one, social stories from session two and/or visual aids from sessions three through five for this session. Participants practiced lower-level fears and were heavily reinforced for completing the tasks. Participants rated their fears much lower after having completed the task while practicing the STOP techniques, coping skill, and their fidget toys. The participants were willing to take on another challenge. For homework, the student was also asked to practice this in another setting (home or school). Students were reminded of the upcoming conclusion of services, and any questions or concerns about termination and next steps were welcomed.

During the seventh session (titled *Maintenance*), the child and therapist reviewed some of the challenges from the weekly homework. The purpose was to encourage the coping strategies are across settings to be practiced and continued by the child beyond the eight sessions. For instance, rather than being in a room alone at school, a child was encouraged to try it at home and to continue to increase the challenge (e.g., five minutes, ten minutes, fifteen, thirty, and so on). In addition to the homework, the student was exposed to a higher-level challenge within the session. Similar to session six, the participants used their STOP technique, favorite coping skill, and favorite fidget toy during the session to manage their anxiety while facing a more difficult or intense fear (e.g., being in the room alone for a longer period of time). The participants were successful in this level of exposure and were given more homework to continue to practice within the home setting. Students were reminded that the next session was the final session.

The final session concluded the therapy session with discussion about termination, addressing student concerns about the future, reviewing highlights, predicting future challenges, planning solutions, and generalizing to other settings. Students were given a copy of their progress they made throughout therapy (a copy of "how much they grew" was given based on the starting rank of their fear ladder to the rank of their fear ladder on the final day of therapy).

The therapist also provided parents with an in-person didactic on anxiety, how it presents in their child, and coping strategies that may be useful for the child. This hour-long session was an opportunity for parents to learn more about their child, voice their concerns, provide feedback, and ask any questions that they had regarding their child's progress and the intervention.

A survey and exit interview were given to determine student's perception of the usefulness of this intervention. Perceived levels of anxiety were measured by a rating scale and their perception for the usefulness of the intervention was measured by their rating of the techniques. The techniques were modeled and practiced by the student in session. They were also used during the exposure portion of the treatment. In addition, effectiveness was measured by a test of their knowledge that covered concepts discussed in treatment (i.e., ability to define a false alarm, real alarm, and naming three techniques learned). Post-intervention measures were completed by the parents and teachers using the TEI to reevaluate the usefulness of the intervention after implementation. They also completed the BIRS to assess their overall satisfaction with the treatment by measuring acceptability, effectiveness, and time of effect.

Data Analysis

A quasi-experimental, single case research design was conducted using nonconcurrent multiple baseline design (MBD) across participants. In MBD, baseline-to-intervention (in this

case, an AB design) was compared across participants. The researcher predicted that perceived levels of anxiety would decrease after the start of intervention (i.e., when the independent variable was introduced). Researchers suggest this pattern is best replicated across tiers (participants) in the multiple baseline so that internal validity (evidence of a treatment effect) could be strengthened (Riley-Tillman & Walcott, 2007). According to What Works Clearinghouse *Procedures and Standards Handbook, Version 5.0.* (WWC, 2022), multiple baseline designs "must have a minimum of six phases split into two conditions." Thus, the researcher recruited a minimum of three students who each received baseline and intervention phases to meet WWC Standards Without Reservations.

The requirement that participant observations be measured at overlapping time periods (e.g., concurrent data) clearly poses problems for researchers in school settings because students with the same target behavior may only infrequently be referred (or consented) at the same point in time. Watson and Workman (1981) described a nonconcurrent multiple baseline design for which participants begin the study as they are referred to the researcher. Christ (2007) reviewed the merit of both concurrent and nonconcurrent MBD with consideration of their ability to assess threats of internal validity and establish experimental control. He concluded that both were experimental designs and have potential to contribute to science. The key to nonconcurrent MBD is the *a priori* specification of baseline durations and random assignment of participants to baseline durations (Christ, 2007). For this study, the researcher used staggered entry points with randomly assigned baseline lengths to reduce the threat to internal validity of maturation (i.e., normal processes that cause participants to change across time). Nonconcurrent design was especially practical within a school setting. There were many factors (i.e., parent permission, child consent, fit for treatment, attrition, and school scheduling) that were considered when

selecting a flexible and practical design for this study. The nonconcurrent design allowed for students to be recruited on a rolling basis and be randomly assigned a particular number of baseline sessions prior to beginning treatment. For example, baseline session 1 did not start on the same date for Ashton as it did for Sawyer based on the rolling recruitment.

Some disruptions in weekly interventions (e.g., student illness, field trip, school break, etc.) were expected. There were 18 weeks of the semester. In the interest of time, the researcher collected data twice a week to ensure that each student obtained at least 5 data points per phase. Stable baseline data was also achieved prior to the start of intervention even with a pre-determined set of baseline data (nonconcurrent baseline). Given the requirement for *a priori* assignment of baseline durations, these were established via random assignment pre-intervention (Christ, 2007).

There are a different ways to calculate effect sizes for single case experimental designs (Sullivan & Fein, 2012). Schlosser, Lee, and Wendt (1987) recommended using the percent of nonoverlapping data (PND) for single case studies to determine effect size. The PND is based on the notion that the smaller the percentage of overlap across phases, the greater the impact of the intervention. For AB data, PND is typically calculated by locating the lowest data point in baseline and counting the number of data points which fall below that baseline data point. One of the38otentiall criticisms of PND, however, is that it may be heavily impacted by outliers (Fingerhut et al., 2021). Tau-U is another method for determining effect size. It contains similar properties to PND and is commonly used for single-case experimental designs (Fingerhut et al., 2021).

When considering how to calculate the effect size for this study, it was important to take into account both the small sample size and the variability in responses to treatment among

children on the spectrum. Given the possibility that outliers may be present, Tau-U was used to capture the effectiveness of this intervention. Specifically, a Tau-U $_{A\ vs\ B}$ was used to compare baseline and intervention since there were no major trends within baseline and it was relatively stable.

CHAPTER 3: RESULTS

Research Question 1

To address research question 1 (To what extent do perceived levels of anxiety decrease for school age students with ASD using a modified version of the MATCH ADTC curriculum?), progress monitoring data during baseline and intervention were examined for each participant.

Ashton (Pseudonym for Participant One)

Ashton was an eight-year-old Caucasian male enrolled in a kindergarten through eighth-grade school. He was a student with a medical diagnosis of autism and received special education services for a speech impairment (SI) with goals in articulation. He was a creative child who enjoyed drawing spaceships and discussing science fiction, spaceships, and books. He was a member of the mathletes team and was invited to participate in a math competition during the start of the intervention; however, he declined the invitation due to fear of "failure" and "embarrassment in front of a crowd." Per his mother, Ashton struggled to build and maintain friendships because he did not partake in the same interests as most boys his age. He also appeared to struggle with social communication and consistently avoided eye contact with others. He was frequently observed sitting by himself during unstructured time in the classroom. He also was noted to eat outside of the cafeteria with trusted adults.

Overall, Ashton's mother perceived his anxiety levels higher than he did for himself based on the SCARED (See Table 1). His mother's scores fell within the clinically significant range in the areas of total anxiety, generalized anxiety, and school avoidance. They both endorsed clinically significant scores in the areas of separation anxiety and social anxiety. These scores were generally consistent with the SCAS scores which were also elevated for him and his mother prior to the start of the intervention (See Table 2).

Table 1. Pre-Intervention Parent/Child SCARED Ratings- Ashton

	Parent	Child
Total	46*	24
Panic	3	0
Generalized	16*	7*
Separation	12*	7*
Social	11*	9*
School	4*	1

*Clinically significant scores: Total= >25; Panic= >7; Generalized= >5; Separation= >5; Social= >6; School = >3

The rating scales indicated that school-related anxiety and social anxiety were negatively impacting his ability to function in school. During the first few sessions, Ashton expressed awareness that he was different from his peers and had goals to find more confidence to talk to peers. Therefore, Ashton focused on his fear of conversing with teenagers.

The exposure aspect of the intervention included two middle school girls talking to him about his interests for sessions six and seven, and him starting up a conversation with a group of middle school boys in the hallway after session seven. The conversation with the girls was planned and expected; however, the discussion with the boys was an unexpected situation. Still, Ashton accepted the challenge presented by the therapist, and with some encouragement and reminders of his previously learned skills, he successfully engaged in reciprocal conversation with middle school students in the second to last session. He was able to say what went well (i.e., the boys asked him questions and he responded well, and asked them questions) and what was

difficult for him (i.e., he wasn't planning on talking to a group of boys). Overall, this exposure impacted his final rating for anxiety talking to older peers (i.e., teenagers), after he saw how successful he could be completing the task.

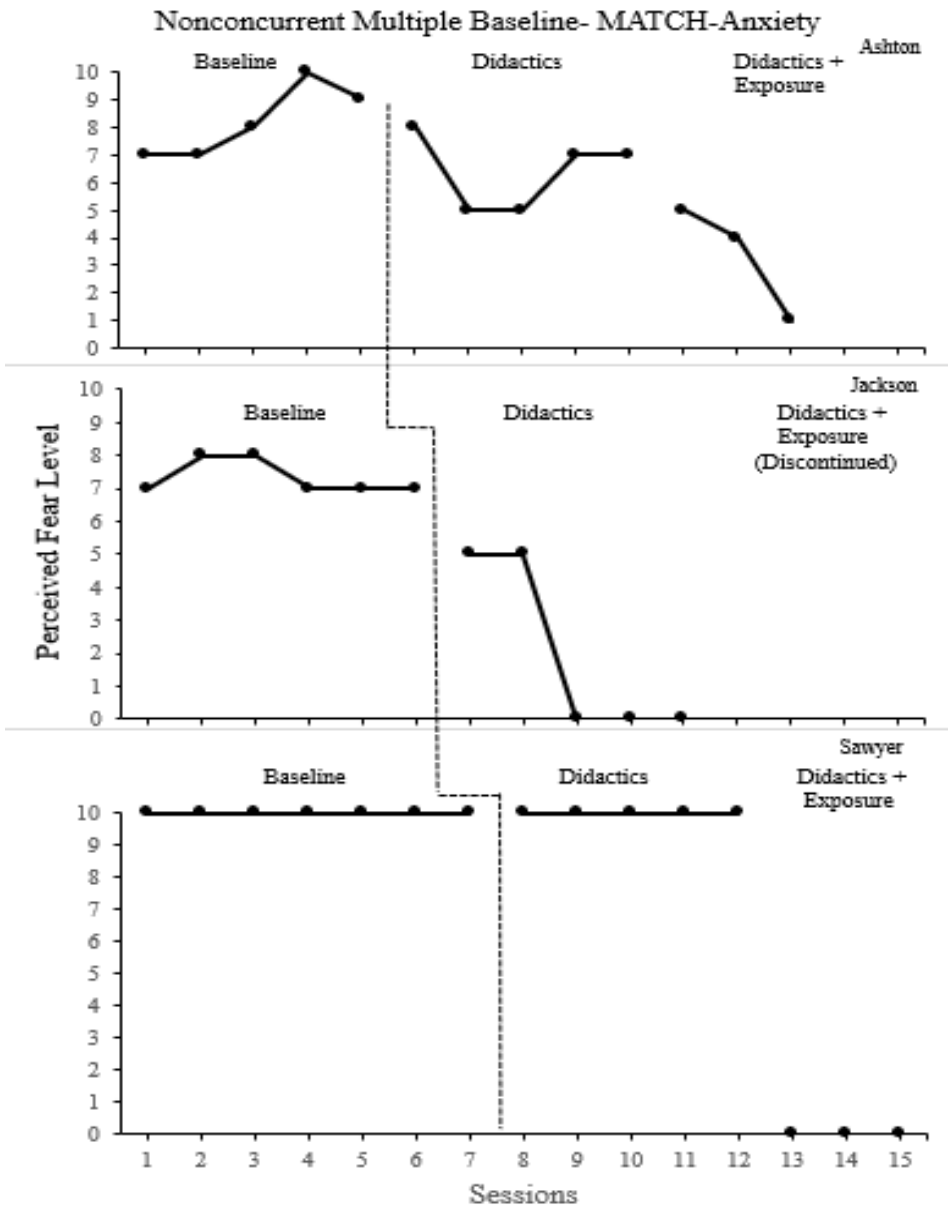
Table 2. SCAS Total Parent/Child Ratings- Ashton

	Pre- Intervention	Post-Intervention	Reliability Change Index
Parent	44*	43*	Stable
Child	27*	26*	Stable

*Clinically significant scores= >24

Ashton's progress monitoring anxiety data are presented in Figure 1. He was asked to rate his fear levels on a scale of 1 to 10 (1 being calm and 10 being extremely scared) when thinking about what it would be like to talk with a teenager. During baseline, his scores ranged from 7 to 10, with a mean of 8.2 and a standard deviation of 1.16. Baseline data reflected a moderate-to-high level, slightly accelerated trend with low variability. Upon the implementation of MATCH-A, his ratings fluctuated throughout the didactic portion of the intervention, but the data shifted to a moderate level, descending trend with low variability (M= 6.4, SD= 1.34). This data shifted again in the final part of the intervention when the didactics were paired with exposure therapy into a low-level, descending trend with low variability (M= 3.33, SD= 2.08). There was a 35.7% decrease from the start of the intervention until the end (i.e., a seven-week span). Overall, there was a statistically significant difference from baseline to intervention and the treatment was found to have a medium effect size ($p < .05$, Tau-U= -0.77, SD= 13.66, 90% CI= [-1.00, -0.21]).

Figure 1. Nonconcurrent Multiple Baseline Data Presentation



*Sessions were completed nonconcurrently (i.e., participants did not receive interventions on the same day; however, content was consistently presented for each participant during each session).

Jackson (Pseudonym for Participant Two)

Jackson was a fourteen-year-old Caucasian male. He was eligible for special education services in the category of autism and had specific goals to address social skills. He took an interest in agriculture, horticulture, and plants. Jackson was quiet, soft-spoken, and slow to respond. He did not frequently initiate conversations with the therapist but often reciprocated conversation with a short-ended response. When asked open-ended questions, he frequently shrugged his shoulders or used the phrases "I am not sure" or "I do not know."

Table 3. Pre-Intervention Parent/Child SCARED Ratings- Jackson

	Parent	Child
Total	34*	16
Panic	15*	4
Generalized	7*	5*
Separation	2	3
Social	8*	4
School	2	0

*Clinically significant scores: Total= >25; Panic= >7; Generalized= >5; Separation= >5; Social= >6; School = >3

There were discrepant anxiety ratings between Jackson and his mother on the SCARED. His mother indicated elevated scores in the areas of total anxious behaviors, panic disorder, and social anxiety; however, his scores were in the moderate risk range on the SCARED (Table 3). The discrepant scores between mother and child were also consistent for the SCAS rating scale

(Table 4). Initially, it was challenging to formulate treatment goals because of his low engagement. Jackson focused on his worries and concerns about the future because of fear of what could happen. Per Jackson, the news was a major contributor to his fears. He heard and watched many current events which made him fearful of getting hurt or dying.

If Jackson participated in the exposure portion of this intervention, he would have been able to choose among discussion of a past event, reading an article about what is going on in the world, watching an episode of the news, or coming up with another challenge that best suited his comfort level. The goal of the exposure would aim to shift his thinking of "what's wrong" to "what's strong." Ultimately, he opted not to complete the final two sessions of the intervention (i.e., exposure therapy) as he reported that he no longer experienced anxiety-related thoughts about the future or a needed to talk with someone about anything anxiety related as was previously the case.

Table 4. SCAS Total Parent/Child Ratings- Jackson

	Pre- Intervention	Post-Intervention	Change in Score
Parent	29*	33*	+4
Child	15	3	-12

*Clinically significant scores= >24

Jackson's progress monitoring anxiety data are presented in Figure 1. During baseline, his scores on SCARED ranged from 7 to 8, with a mean of 7.33 and a standard deviation of 0.52. Baseline data had a moderate-to-high level, stable trend with low variability. During Phase B (i.e., the implementation of MATCH-A), the data shifted to a moderate-to-low level, descending

trend with low variability, as he reported lower levels of anxiety (M= 2.0, SD= 2.74). He completed five out of eight sessions and discontinued services before the three remaining sessions (i.e., the exposure part of the intervention) were conducted.

There was a 72.7% decrease in his perceived levels of anxiety. Although he did not complete the remaining three sessions of the intervention, there was a statistically significant difference between his reported anxiety levels from baseline to intervention and a large effect size was established ($p < .05$, Tau-U= -1.00, SD= 10.95, 90% CI [-1.00, -0.47]). A large effect size.

Sawyer (Pseudonym for Participant Three)

Sawyer was a seven-year-old Caucasian male with a school classification of autism and a specific learning disorder (SLD) in reading. He received special education services primarily for reading and had measurable goals for social skill development in his IEP. In general, he demonstrated social skills and fostered positive relationships with peers at his school. He frequently had many students and teachers greet him by name in the hallway. He appeared to enjoy the interactions, as evidenced by smiles and appropriate responses (e.g., waving, saying "hey" back). Sawyer co-slept with his parents daily, feared being in his room alone, struggled to go to public bathrooms alone, and feared being kidnapped in social settings.

Sawyer received clinically significant scores on both parent and child SCARED rating scales, which indicated a high probability of elevated perceived anxiety levels (Table 5). There was minimal variability between his scores and his parent's ratings. Both he and his mother reported clinically significant scores in separation anxiety and total anxiety. In addition, Sawyer's mother's scores were clinically significant in social anxiety. Consistent with the

elevated SCARED scores, he received high overall scores on the SCAS-P and SCAS-C which suggested that he exhibited many anxious behaviors, particularly seen at home (See Table 6).

Table 5. Pre-Intervention Parent/Child SCARED Ratings- Sawyer

	Parent	Child
Total	36*	32*
Panic	4	4
Generalized	8*	6*
Separation	12*	13*
Social	9*	6*
School	3*	3*

*Clinically significant scores: Total= >25; Panic= >7; Generalized= >5; Separation= >5; Social= >6; School = >3

Sawyer's self-report and parent report contained ratings in the clinically significant range on the SCAS prior to the start of the intervention. According to the SCARED, separation anxiety was the most prominent area of anxiety that interrupted his daily functioning. Sawyer and his mother both agreed that focusing on goals to address separation anxiety in MATCH was the preferred target area.

For the exposure portion of the intervention, Sawyer was challenged to sit in the room by himself with the therapist outside of the door for ten minutes for three sessions. During this time, Sawyer used his favorite fidget toys, and practiced his coping strategy (i.e., imagining his happy place) by looking outside the window. Sawyer happily discussed what worked well for him (i.e.,

looking outside and imaging he was out there, playing with his fidget, and blowing bubbles) but did not report any specific challenges. Because of his ease accomplishing his perceived challenge, Sawyer was also encouraged to try this activity at home after session 6. He advised he would attempt to go into the upper room of his home and remain in there alone for 5 minutes- something he reportedly refused to do without his parents. In the next session, he stated he was successful with that and that it was "not as bad as [he] thought" because he played with his fidgets and got to play his video games after. After session seven, he was successful with exposure at the school and was given another home challenge. This time, he offered to be in the kitchen alone for ten minutes- another task he preferred to do with his mother. At the start of the eighth session, he noted that this task was also feasible for him, and his fear levels subsided as he practiced his skill and also played a video game afterwards. Although the sessions ended after that, he considered entering his own room (which he was previously scared of due to bad dreams he had in there) for two minutes.

Table 6. SCAS Total Parent/Child Ratings- Sawyer

	Pre- Intervention	Post-Intervention	Change in Score
Parent	43*	38*	-5
Child	47*	32*	-15

*Clinically significant scores= >24

Sawyer's progress monitoring anxiety data are presented in Figure 1. During baseline, his scores on the abbreviated SCARED were consistently a 10, with a mean of 10 and standard deviation of 0. Baseline data were high-level and stable with a zero trend before the intervention

began. He rated his fear level a ten out of ten (extremely scared) for being in a room alone throughout baseline (A). Upon implementation of MATCH-A, there were no differences in ratings during the didactic portion of the intervention, phase B (i.e., the data in both phases A and B was a high-level, stable trend, with no variability; M= 10, SD= 0). However, his ratings shifted after in-vivo exposure therapy (the final three sessions). In those final three sessions, he had a low-level, stable trend with no variability. By the end of MATCH-A, he rated his fear level of being in a room a zero out of ten (extremely calm; M= 0, SD= 0). Within a nearly two-month period, there was an estimated 37.5% decrease in his fear level from baseline to the end of the intervention. Although his scores decreased from 10 to 0 over time, there was no variance in his scores. There was not a statistically significant difference between his perceived anxiety levels from baseline to the intervention, and there was a small effect size established ($p > .05$, Tau-U= -0.38, SD= 17.28, 90% CI= [-0.88, 0.13]).

Student Data

All three participants reported decreased levels of anxiety, suggesting an immediacy of effect from baseline to intervention. Both Ashton and Sawyer's anxiety levels appeared to be most significantly impacted by the exposure portion of the intervention.

Pre-Post Intervention Ratings

On post-intervention ratings, Ashton reported a decrease in total anxious behaviors, generalized anxiety, separation anxiety, social anxiety, and school avoidance. He reported an increase in panic disorder (see Table 7). Jackson rated himself lower in all categories except school avoidance. His score for school avoidance remained the same, indicating no concerns in that area (See Table 7). Sawyer reported lower perceived levels in all categories (See Table 7). On average, child ratings for perceived anxiety levels decreased after the intervention was

completed; however, relative to the sample (Birmaher et al., 1999), there were no clinically significant differences in the desired direction from Time 1 to Time 2 for any of the participants and the differences were generally stable across the SCARED categories.

Table 7. Pre/Post Intervention Child SCARED Ratings

	Pre- Intervention (Time 1)	Post- Intervention (Time 2)	Change in Score	Reliable Change Index (Descriptor)
Total				
Ashton	24	9	-15	40.12 (stable)
Jackson	16	4	-12	40.12 (stable)
Sawyer	32*	15	-17	40.12 (stable)
Panic				
Ashton	0	2	+2	15.31 (accelerated)
Jackson	4	2	-2	15.31 (stable)
Sawyer	4	2	-2	15.31 (stable)
Generalized				
Ashton	7*	0	-7	13.45 (stable)
Jackson	5*	0	-5	13.45 (stable)
Sawyer	6*	1	-5	13.45 (stable)
Separation				
Ashton	7*	3	-4	9.28 (stable)
Jackson	3	1	-2	9.28 (stable)
Sawyer	13*	9*	-4	9.28 (stable)
Social				
Ashton	9*	4	-5	9.74 (stable)
Jackson	4	1	-3	9.74 (stable)
Sawyer	6*	3	-3	9.74 (stable)
School				
Ashton	1	0	-1	6.26 (stable)
Jackson	0	0	0	6.26 (non-meaningful)
Sawyer	3*	0	-3	6.26 (stable)

*Clinically significant ratings: Total= >25; Panic= >7; Generalized= >5; Separation= >5; Social= >6; School = >3)

Research Question 2

To address research question 2 (*To what extent do school-age students perceive the usefulness of this intervention in their lives?*), a pre- and post-intervention survey was provided to the participants to identify their level of understanding of anxiety, their knowledge of coping strategies, and their likelihood of using the skills learned in treatment in the future. In addition, participants were given the opportunity to provide additional feedback (about what they liked and disliked). The surveys also included four knowledge check questions to measure their understanding of the material. It was the hope that participants who remembered and understood the material could successfully apply and generalize the skills in different settings (e.g., school, social outings, community). Table 8 displays the results of the pre-and post-intervention surveys that were delivered to the participants.

The anxiety knowledge question gauged the extent to which participants knew about anxiety. One student (Jackson) reported some level of knowledge prior to the start of the intervention. However, the two other participants reported an understanding of anxiety after the intervention was delivered. The enjoyment of therapy question asked participants how much they enjoyed working with someone to learn new skills to apply in everyday life. Apart from Sawyer, the participants reported never having received therapy in the past, but they all reported a level of appreciation for it after the treatment was completed. The first knowledge check prompted students to recall three skills or items learned from treatment. Sawyer needed verbal prompting to answer this question. However, the other two participants independently provided information about what they learned in treatment. None of the participants indicated knowledge or use of coping skills they had used before the intervention; however, all three participants noted knowledge of new skills following treatment delivery.

Table 8. Pre/Post Intervention Survey Ratings

	Pre- Intervention (Time 1)	Post- Intervention (Time 2)	Change in Score
Anxiety knowledge			
Ashton	0	3	+3
Jackson	1	1	0
Sawyer	0	3	+3
Enjoyment of therapy			
Ashton	0	1	+1
Jackson	0	1	+1
Sawyer	3	3	0
Name three things			
Ashton	0	3	+3
Jackson	0	3	+3
Sawyer	0	1	+1
Knowledge of coping skills			
Ashton	0	2	+2
Jackson	0	2	+2
Sawyer	0	1	+1
Plan for use			
Ashton	0	2	+2
Jackson	0	0	0
Sawyer	0	2	+2
Current Anxious Feelings			
Ashton	3	2	-1
Jackson	0	0	0
Sawyer	3	0	-3
Good/bad anxiety			
Ashton	0	2	+2
Jackson	0	3	+3
Sawyer	0	3	+3
False alarm check			
Ashton	0	3	+3
Jackson	0	3	+3
Sawyer	0	3	+3
Real alarm check			
Ashton	0	3	+3
Jackson	0	3	+3
Sawyer	0	3	+3

The plan for use question aimed to predict the use of the coping strategies (if knowledgeable). Sawyer and Ashton indicated plans to use the strategies in their toolbox; however, Jackson did not. There was a reported decrease in anxiety levels from the start of the intervention to the end for all participants except for Jackson, who did not report any levels of anxiety at the time of the surveys. The second knowledge check was a "true" or "false" item, questioning if there is "good" AND "bad" anxiety or if it only had a negative connotation to it. All participants appeared to associate anxiety with something negative until after treatment, where they were taught about "good" and "bad" anxiety. The third and fourth knowledge checks explored the participants' ability to provide an example of a false alarm and an example of a real alarm. Before the intervention, the students could not provide an example, but each student could give an example afterward.

The results of the post-intervention survey indicated that participants learned new material and benefitted from someone providing this type of therapy to them. The participants who completed the intervention to its entirety reported being more likely to use the strategies of this intervention in the future relative to the participant who did not complete the final two sessions (i.e., exposure therapy) of the intervention.

Research Question 3

To address research question 3 (*How do parents and teachers rate levels of satisfaction regarding modular therapy treatment and outcomes for these students?*). A Bayesian independent samples t-test was used to compare parent and teacher satisfaction of this intervention after having their child complete the intervention. A comparison would determine if parents and teachers rate levels of satisfaction for the intervention differently based on how relevant the intervention was perceived for home and school settings. The TEI was used to

collect pre- and post- intervention ratings. Although on average, parents rated higher levels of usefulness and acceptability following the intervention (M = -0.32), there were no significant differences found from pre-and post-intervention ratings. This suggests that there was not sufficient evidence to suggest a difference in parent's pre-and post-intervention ratings for usefulness of the intervention $t(2)$= -0.55, p > .05, 95% CI [-2.828, 2.188]. Similarly, teachers reported on higher ratings for usefulness and acceptability following the intervention (M = -1.17). While there is support that there is a difference between the two ratings (BF >1), there were no significant differences found from pre- and post- intervention ratings. This indicates that there was not sufficient evidence to support a difference in teachers' pre-and post-intervention ratings for usefulness and acceptability of the intervention $t(2)$= -1.94, p > .05, 95% CI [-3.752, 1.419].

Differences Between Parent and Child Ratings

Overall, parent and child ratings post-intervention were variable. On average, parents perceived higher anxiety levels than their children. Most parents still reported clinically significant scores in generalized, separation, and social anxiety. However, on average, there was no trend pertaining to clinically significant scores reported by the children. All child post-intervention ratings for total anxious behaviors decreased.

Similar to pre-intervention data, parents reported elevated levels of anxiety compared to their children (See Figures 1.2, 3.2, and 4.2). Although SCAS-P and SCAS-C scores generally remained clinically significant for most ratings, there was a decrease in all parent and child-rated scores from pre-intervention to post-intervention.

Parents Pre- and Post-Intervention Ratings

After the intervention was completed, parents, on average, reported a decrease in most indices of the SCARED; however, it should be noted that there were some areas of emerging concern. Ashton's parent reported a decrease in total anxious behaviors, generalized anxiety, and social anxiety (Table 9). His mother reported an increase in school-avoidance.

Table 9. Parent Ratings on the SCARED

	Pre- Intervention (Time 1)	Post- Intervention (Time 2)	Change in Score	Reliable Change Index (Descriptor)
Total				
Ashton	46*	43*	-3	40.12 (stable)
Jackson	34*	30*	-4	40.12 (stable)
Sawyer	36*	33*	-3	40.12 (stable)
Panic				
Ashton	3	3	0	15.31 (non-meaningful)
Jackson	15*	11*	-4	15.31 (stable)
Sawyer	4	3	-1	15.31 (stable)
Generalized				
Ashton	16*	14*	-2	13.45 (stable)
Jackson	7*	5*	-2	13.45 (stable)
Sawyer	8*	10*	+2	13.45 (accelerated)
Separation				
Ashton	12*	12*	0	9.28 (non-meaningful)
Jackson	2	3	+1	9.28 (accelerated)
Sawyer	12*	11*	-1	9.28 (stable)
Social				
Ashton	11*	9	-2	9.74 (stable)
Jackson	8*	9*	+1	9.74 (accelerated)
Sawyer	9*	8*	-1	9.74 (stable)
School				
Ashton	4*	5	+1	6.26 (accelerated)
Jackson	2	2	0	6.26 (non-meaningful)
Sawyer	3*	1	-2	6.26 (stable)

*Clinically significant scores: Total= >25; Panic= >7; Generalized= >5; Separation= >5; Social= >6; School = >3

There was no change in scores for perceived panic disorder and separation anxiety levels. Although there were decreased ratings across most composites of the SCARED, none of the differences were clinically significant within this four- week intervention relative to the sample.

Jackson's mother reported a decrease in total anxious behaviors, panic disorder, and generalized anxiety. She reported an increase in separation anxiety and social anxiety. Ratings remained the same for school avoidance. Although there were decreased ratings in most composites of the SCARED, none of the differences were clinically significant within this four-week intervention relative to the sample.

Sawyer's mother reported a decrease in total anxious behaviors, panic disorder, separation anxiety, social anxiety, and school avoidance. His mother reported an increase in generalized anxiety. Although there were decreased ratings across most composites of the SCARED, none of the differences were clinically significant within this four- week intervention relative to the sample.

CHAPTER 4: DISCUSSION

Individuals with autism spectrum disorder (ASD) commonly have a co-existing condition of anxiety (White et al., 2018). There is a growing body of research that focuses on the treatment for students with ASD and anxiety as researchers strive to find effective behavioral interventions to support developing youth. The use of cognitive behavioral therapy (CBT) has been adapted by many therapists to treat symptoms of anxiety. Vocal and verbal autistic individuals who require minimal supports and have the cognitive capacity and skills necessary to understand the cognitive triangle of CBT (i.e., thoughts, behaviors, actions) have been found to benefit from CBT.

Autistic individuals may experience symptoms related to their disability (e.g., repetitive and restrictive behaviors, social-communication difficulties, and/or sensory needs) which exacerbate their anxious feelings (Reaven et al., 2011). Researchers found that autistic students who also have anxiety may therefore experience an increased risk of truancy, disengagement from school activities, aggression, and school drop-out (Preece & Howley, 2018). However, CBT is an evidence-based psychosocial treatment to combat some of those mental health needs and provide children with foundational skills that may be necessary for a successful future.

MATCH-A is a form of CBT that comprises of evidence-based interventions that treat symptoms of anxiety. This research study proposed to determine whether perceived levels of anxiety would decrease for school age students with ASD using a modified version of the MATCH-A curriculum. Within these eight sessions, the clinician educated students about anxiety, thinking patterns, helpful and unhelpful thoughts, and effective coping strategies in efforts to support their mental health. They were also challenged to practice their newly learned

skills while being exposed to their fear. They were asked to rate their fear levels for specific situations at the start of every session. Their ratings gradually declined as the sessions continued.

While there were no clinically significant differences from start to finish of the four-week intervention, there was evidence to suggest that implementation of MATCH-A reduced levels of anxiety among children with an autism school classification and/ or diagnosis as evidenced by lower post-intervention anxiety scores compared to pre-intervention anxiety scores. Ashton and Jackson's scores gradually decreased throughout the intervention, suggesting that learning about helpful and unhelpful thoughts shifted their fears about a particular situation. Sawyer's scores in the didactic portion remained constant, which may have suggested he developed a pattern of rigidity regarding his thoughts on a fearful situation. However, after he engaged in the exposure and practice portion of the intervention, he ultimately decreased his ratings. It is possible that symptoms of autism (e.g., rigid patterns of thinking, communication difficulties) may interfere with aspects of this intervention but results from this research study suggest that positive outcomes are possible when students with autism are engaged in this intervention.

This study also examined the extent to which MATCH-A may be useful to students with a diagnosis or school classification for autism. The students were encouraged to practice some of their newly learned coping strategies. They also willingly and successfully faced challenging situations with exposure to their fears. Ultimately, their knowledge acquisition and perceived usefulness for this intervention was assessed by a test of skills at start of the intervention and once again at the end of the intervention. Increased scores on the post-test revealed that students learned information about what anxiety is and were also able to recall some of the most important aspects discussed in the didactic portion (e.g., false alarms versus real alarms, deep breathing, progressive muscle relaxation). Overall, ratings from the "test your knowledge" the

students who completed the intervention found this to be a useful intervention, and plan to use the techniques in the future.

Lastly, this study examined the social validity of this intervention using parent and teacher ratings to inform their satisfaction, acceptability, and perceived usefulness of the intervention. Although most of the teachers included remarks that the child's improvements were not visibly evident in the academic setting, their ratings reflected positive satisfaction and acceptability. Likewise, they all stated they would recommend this intervention for other students. It is possible that some of the teachers observed positive interactions between the child and researcher and concluded that the intervention was beneficial for the child, despite minimal impact on educational performance. Parents also rated positive satisfaction and acceptability of the intervention on the BIRS. Ratings were relatively consistent between parent and teacher, but parents generally provided higher scores of satisfaction. It is possible that these children's specific anxiety presentations (e.g., social anxiety, generalized anxiety, and separation anxiety) may have impacted family functioning more than academic functioning. In addition, most of their post-intervention SCARED ratings decreased from pre-intervention, suggesting that there were some changes for the child during the four-week period. Parents were also given a didactic component of the intervention where they were informed about the nature of anxiety, how it may look different in their child, and coping skills that could be used to reduce anxiety levels. Parents were generally pleased with this aspect of the intervention, stating anecdotally that it was helpful to know what the child was learning and how they could better support their child.

Although many research studies yielded clinically significant findings and this study did not, these results were generally consistent with research regarding the effectiveness of CBT for youth with autism (Chalfant, Rapee, & Carroll, 2012; White et al., 2015; Lickel et al., 2012).

Similar to many other previous studies, the autistic children in this study experienced a decrease in anxiety levels after the start of this CBT intervention.

Limitations

Determining effectiveness by using behavioral data was a limitation. Anxiety is an internalizing or an "acting in" behavior that can be difficult to operationally define, observe, and measure. For this study, anxiety was defined using terms from the Zones of Regulation; however, there were no standardized observations used to objectively measure anxiety by the researcher. For this study, measurement of anxiety was based on the child reported levels of anxiety using a fear thermometer that was scaled from zero (very calm) to ten (extremely nervous). Although there were visuals to differentiate units of measurement (e.g., a level two rating from a level three rating, or a level seven rating from a level eight rating), it was only an expectation that the child understood the value of each unit. There is no guarantee that the reported numerical values were an accurate representation of the child's true level of anxiety. Rating scales may be helpful for practitioners to have an idea of the magnitude of problem behavior; however, it is not always an accurate identifier. Similarly, surveys and questionnaires are not always a clearly measurable and defined method for behavioral outcome measures. To address this barrier, the therapist supplemented the surveys and questionnaires with careful observations (e.g., noticing behavior changes when discussing topics, acknowledging their ability to complete deep breathing exercises, noting which sensory items they engage with while practicing skills, etc.) and weekly knowledge checks (i.e., tell me three things you learned about anxiety). Although behaviors in session appeared consistent with their survey responses, the true levels of anxiety for the participants remained unmeasurable.

Another limitation of this study was the duration of the intervention. MATCH-A was an eight-session intervention that was delivered twice per week. There was approximately two months' time elapsed between parent and child's baseline and intervention rating scales. Although parent and child scores decreased as expected, two months/eight sessions did not appear enough time to produce substantial or significant behavioral outcomes. Duration limitations also appeared to impact children's effectiveness scores. The students who completed the exposure portion of the intervention experienced a decline in anxious behaviors from baseline; however, exposure began during the fifth session. There were simply not enough data points to produce substantial differences in three sessions.

This intervention was not developmentally appropriate for all children. Some children appeared to be a good fit for the intervention after meeting the criteria, but behavioral difficulties emerged within some of the first few interactions. For example, one student engaged in many challenging behaviors such as elopement and aggression. He eloped out of rooms when presented with an undesirable task (e.g., learning). The student used a tablet during most of the instructional school day and verbal pedagogy at times appeared aversive to him. MATCH comprises of verbally loaded didactic components that make up a large portion of the intervention. Despite inclusive efforts to tailor the sessions to his needs (i.e., the use of fidgets, visuals, visual schedules, and breaks), the student struggled to maintain or regain his focus during the allotted intervention or specials time (i.e., thirty to forty minutes). There were also several days that he was suspended from school due to behavioral escalations that resulted in hitting, biting, or harming teachers, administrators, and/or students. His extensive absences made it difficult to proceed with intervention without repeating several lessons and compromising the integrity of the intervention. It is possible that deficits in emotional regulation skills impaired his

ability to recognize his emotions and use appropriate coping skills when he was distressed. This intervention involves complex thinking and may be better suited for children that exhibit the capacity to regulate their emotions. Furthermore, a good candidate for this treatment may have already acquired skills related to coping, communication, and emotion regulation. This was not something that was assessed for this study, but perhaps could have been through the use of other parent or teacher rating scales.

The impact of confounding factors on treatment goals was another limitation. One clear example of this was Jackson, who suddenly discontinued services. Although slow-to-warm-up, Jackson was involved and interactive with the therapist during baseline. He played games, discussed some of his fears, and appeared receptive to therapy. However, when the intervention began, he became less responsive and ultimately discontinued services after the didactic portion of the intervention. At the time, he stated that he'd "rather be in [his] class" and that he "felt better" and no longer needed services. Upon speaking with his mother, she informed the therapist that a family friend's health took a turn for the worse around the time that the didactic portion of the intervention began. The family friend was a father-like figure to Jackson, and it was something that she believed really bothered him, but he seldom talked about it to her or anyone else. Because the therapist was unable to address this issue, the therapist provided the mother with resources related to grief and support. It is possible that outside factors may have impacted his ability to focus on himself during intervention. Students' goals or desires for therapy may shift based on personal life circumstances. Even if the child continued services, it is likely that this intervention would not have allowed for much wiggle room to prioritize other matters outside of anxiety.

Adhering to a school schedule had its limitations. Not only were the sessions limited to the 30-45 minute block schedule, but other conflicting events sometimes interrupted the ease of service delivery. Field trips, quarterly testing, and change of schedules were at times barriers that required the therapist to rearrange her own schedule. While this was feasible for her, it may not be a practical option for other therapists with a less flexible schedule. The intervention was also completed towards the end of the spring semester. Unlike the fluid structure of most therapeutic settings, there was not much time to reschedule time with students, focus on other problems outside of anxiety, or address other personal concerns if they came about. Referrals were made for cases and situations like Jackson's, but ideally, this intervention would allot the time to address such concerns. This intervention may be better implemented earlier in the semester to allow more time to practice, or even practiced outside of a school setting. This is not to say that school-based therapy is not practical; however, consistent with other CBT modalities, some application is necessary outside of the therapeutic setting to increase fluency with the newly acquired skills and encourage skill maintenance.

It may be helpful to explore the critical components of MATCH-A further. There are session and parts of MATCH-A (e.g., Getting Acquainted, Learning to Relax, Practicing, Maintenance, and so on). In this study, Ashton and Sawyer's anxiety levels were decreased most after the exposure therapy (i.e., practicing lesson). It may be helpful to determine what aspects of each session are most relevant (particularly) to kids with autism.

Future researchers may wish to obtain a larger sample size in order to gain more representation of the autistic community. The sample from this study was male- and Caucasian-dominant. It may be helpful to consider how girls and/or children of color anxiety levels may be impacted by this intervention.

There were some notable differences in parent and child reported levels of anxiety. An area of future research may consider the presence of different variables (e.g., diagnostic overshadowing, understanding of anxiety, differences in topography) that may better explain differences in parent and child ratings.

Conclusion

There was replication of decreased anxiety levels reported by the participants. Thus, there was a causal relation between this modified CBT intervention and decreased levels of anxiety in school age students with autism. One outstanding aspect of this intervention appeared to be exposure therapy within MATCH-A. Parents and teachers also rated satisfaction and acceptability of the intervention and would recommend it to other children with autism.

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Appendix A- SCARED Child Form

Screen for Child Anxiety Related Disorders (SCARED)

Child Version - Page 1 of 2 (To be filled out by the CHILD)

Name: _____ **Date**: _____

Directions:
Below is a list of sentences that describe how people feel. Read each phrase and decide if it is "Not True or Hardly Ever True" or "Somewhat True or Sometimes True" or "Very True or Often True" for you. Then for each sentence, fill in one circle that corresponds to the response that seems to describe you for the last 3 months.

		0 Not True or Hardly Ever True	1 Somewhat True or Sometimes True	2 Very True or Often True
1.	When I feel frightened, it is hard for me to breathe	o	o	o
2.	I get headaches when I am at school	o	o	o
3.	I don't like to be with people I don't know well	o	o	o
4.	I get scared if I sleep away from home	o	o	o
5.	I worry about other people liking me	o	o	o
6.	When I get frightened, I feel like passing out	o	o	o
7.	I am nervous	o	o	o
8.	I follow my mother or father wherever they go	o	o	o
9.	People tell me that I look nervous	o	o	o
10.	I feel nervous with people I don't know well	o	o	o
11.	My I get stomachaches at school	o	o	o
12.	When I get frightened, I feel like I am going crazy	o	o	o
13.	I worry about sleeping alone	o	o	o
14.	I worry about being as good as other kids	o	o	o
15.	When I get frightened, I feel like things are not real	o	o	o
16.	I have nightmares about something bad happening to my parents	o	o	o
17.	I worry about going to school	o	o	o
18.	When I get frightened, my heart beats fast	o	o	o
19.	I get shaky	o	o	o
20.	I have nightmares about something bad happening to me	o	o	o

Screen for Child Anxiety Related Disorders (SCARED)

Child Version - Page 2 of 2 (To be filled out by the CHILD)

		0 Not True or Hardly Ever True	1 Somewhat True or Sometimes True	2 Very True or Often True
21.	I worry about things working out for me	o	o	o
22.	When I get frightened, I sweat a lot	o	o	o
23.	I am a worrier	o	o	o
24.	I get really frightened for no reason at all	o	o	o
25.	I am afraid to be alone in the house	o	o	o
26.	It is hard for me to talk with people I don't know well	o	o	o
27.	When I get frightened, I feel like I am choking	o	o	o
28.	People tell me that I worry too much	o	o	o
29.	I don't like to be away from my family	o	o	o
30.	I am afraid of having anxiety (or panic) attacks	o	o	o
31.	I worry that something bad might happen to my parents	o	o	o
32.	I feel shy with people I don't know well	o	o	o
33.	I worry about what is going to happen in the future	o	o	o
34.	When I get frightened, I feel like throwing up	o	o	o
35.	I worry about how well I do things	o	o	o
36.	I am scared to go to school	o	o	o
37.	I worry about things that have already happened	o	o	o
38.	When I get frightened, I feel dizzy	o	o	o
39.	I feel nervous when I am with other children or adults and I have to do something while they watch me (for example: read aloud, speak, play a game, play a sport)	o	o	o
40.	I feel nervous when I am going to parties, dances, or any place where there will be people that I don't know well	o	o	o
41.	I am shy	o	o	o

**For children ages 8 to 11, it is recommended that the clinician explain all questions, or have the child answer the questionnaire sitting with an adult in case they have any questions.*

Developed by Boris Birmaher, MD, Suneeta Khetarpal, MD, Marlane Cully, MEd, David Brent, MD, and Sandra McKenzie, PhD. Western Psychiatric Institute and Clinic, University of Pgh. (10/95). Email: birmaherb@msx.upmc.edu

Appendix B- SCARED Parent Form

Screen for Child Anxiety Related Disorders (SCARED)

Parent Version - Page 1 of 2 (To be filled out by the PARENT)

Name: _____ **Date**: _____

Directions:
Below is a list of statements that describe how people feel. Read each statement carefully and decide if it is "Not True or Hardly Ever True" or "Somewhat True or Sometimes True" or "Very True or Often True" for your child. Then for each statement, fill in one circle that corresponds to the response that seems to describe your child for the last 3 months. Please respond to all statements as well as you can, even if some do not seem to concern your child.

		0 Not True or Hardly Ever True	1 Somewhat True or Sometimes True	2 Very True or Often True
1.	When my child feels frightened, it is hard for him/her to breathe	o	o	o
2.	My child gets headaches when he/she is at school	o	o	o
3.	My child doesn't like to be with people he/she doesn't know well	o	o	o
4.	My child gets scared if he/she sleeps away from home	o	o	o
5.	My child worries about other people liking him/her	o	o	o
6.	When my child gets frightened, he/she feels like passing out	o	o	o
7.	My child is nervous	o	o	o
8.	My child follows me wherever I go	o	o	o
9.	People tell me that my child looks nervous	o	o	o
10.	My child feels nervous with people he/she doesn't know well	o	o	o
11.	My child gets stomachaches at school	o	o	o
12.	When my child gets frightened, he/she feels like he/she is going crazy	o	o	o
13.	My child worries about sleeping alone	o	o	o
14.	My child worries about being as good as other kids	o	o	o
15.	When he/she gets frightened, he/she feels like things are not real	o	o	o
16.	My child has nightmares about something bad happening to his/her parents	o	o	o
17.	My child worries about going to school	o	o	o
18.	When my child gets frightened, his/her heart beats fast	o	o	o
19.	He/she gets shaky	o	o	o
20.	My child has nightmares about something bad happening to him/her	o	o	o

Screen for Child Anxiety Related Disorders (SCARED)

Parent Version - Page 2 of 2 (To be filled out by the PARENT)

		0 Not True or Hardly Ever True	1 Somewhat True or Sometimes True	2 Very True or Often True
21.	My child worries about things working out for him/her	o	o	o
22.	When my child gets frightened, he/she sweats a lot	o	o	o
23.	My child is a worrier	o	o	o
24.	My child gets really frightened for no reason at all	o	o	o
25.	My child is afraid to be alone in the house	o	o	o
26.	It is hard for my child to talk with people he/she doesn't know well	o	o	o
27.	When my child gets frightened, he/she feels like he/she is choking	o	o	o
28.	People tell me that my child worries too much	o	o	o
29.	My child doesn't like to be away from his/her family	o	o	o
30.	My child is afraid of having anxiety (or panic) attacks	o	o	o
31.	My child worries that something bad might happen to his/her parents	o	o	o
32.	My child feels shy with people he/she doesn't know well	o	o	o
33.	My child worries about what is going to happen in the future	o	o	o
34.	When my child gets frightened, he/she feels like throwing up	o	o	o
35.	My child worries about how well he/she does things	o	o	o
36.	My child is scared to go to school	o	o	o
37.	My child worries about things that have already happened	o	o	o
38.	When my child gets frightened, he/she feels dizzy	o	o	o
39.	My child feels nervous when he/she is with other children or adults and he/she has to do something while they watch him/her (for example: read aloud, speak, play a game, play a sport)	o	o	o
40.	My child feels nervous when he/she is going to parties, dances, or any place where there will be people that he/she doesn't know well	o	o	o
41.	My child is shy	o	o	o

Developed by Boris Birmaher, MD, Suneeta Khetarpal, MD, Marlane Cully, MEd, David Brent, MD, and Sandra McKenzie, PhD. Western Psychiatric Institute and Clinic, University of Pgh. (10/95). Email: birmaherb@msx.upmc.edu

Appendix C – Behavior Intervention Rating Scale

Behavior Intervention Rating Scale

You have just read about a child with a classroom problem and a description of an interventi for improving the problem. Please evaluate the intervention by circling the number which b describes *your* agreement or disagreement with each statement. You *must* answer each question.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree
1. This would be an acceptable intervention for the child's problem behavior.	1	2	3	4	5
2. Most teachers would find this intervention appropriate for behavior problems in addition to the one described.	1	2	3	4	5
3. The intervention should prove effective in changing the child's problem behavior.	1	2	3	4	5
4. I would suggest the use of this intervention to other teachers.	1	2	3	4	5
5. The child's behavior problem is severe enough to warrant use of this intervention.	1	2	3	4	5
6. Most teachers would find this intervention suitable for the behavior problem described.	1	2	3	4	5
7. I would be willing to use this in the classroom setting.	1	2	3	4	5
8. The intervention would *not* result in negative side-effects for the child.	1	2	3	4	5
9. The intervention would be appropriate intervention for a variety of children.	1	2	3	4	5
10. The intervention is consistent with those I have used in classroom settings.	1	2	3	4	5
11. The intervention was a fair way to handle the child's problem behavior.	1	2	3	4	5
12. The intervention is reasonable for the behavior problem described.	1	2	3	4	5
13. I like the procedures used in the intervention.	1	2	3	4	5
14. This intervention was a good way to handle this child's behavior problem.	1	2	3	4	5
15. Overall, the intervention would be beneficial for the child.	1	2	3	4	5
16. The intervention would quickly improve the child's behavior.	1	2	3	4	5
17. The intervention would produce a lasting improvement in the child's behavior.	1	2	3	4	5
18. The intervention would improve the child's behavior to the point that it would not noticeably deviate from other classmates' behavior.	1	2	3	4	5
19. Soon after using the intervention, the teacher would notice a positive change in the problem behavior.	1	2	3	4	5
20. The child's behavior will remain at an improved level even after the intervention is discontinued.	1	2	3	4	5
21. Using the intervention should not only improve the child's behavior in the classroom, but also in other settings (e.g., other classrooms, home).	1	2	3	4	5
22. When comparing this child with a well-behaved peer before and after use of the intervention, the child's and the peer's behavior would be more alike after using the intervention.	1	2	3	4	5
23. The intervention should produce enough improvement in the child's behavior so the behavior no longer is a problem in the classroom.	1	2	3	4	5
24. Other behaviors related to the problem behavior also are likely to be improved by the intervention.	1	2	3	4	5

Appendix D - Therapy Evaluation Inventory

Therapy Evaluation Form

We would like you to indicate below how much you believe, right now, that the therapy you are receiving will help to improve your lifestyle / functioning. Belief usually has two aspects to it: (1) what one thinks will happen and (2) what one feels will happen. Sometimes these are similar; sometimes they are different. Please answer the questions below. In the first set, answer in terms of what you think. In the second set answer in terms of what you really and truly feel. We do not want your course convenors to ever see these ratings, so please keep the sheet covered when you are done.

Set I

1. At this point, how logical does the course offered to you seem?

1	2	3	4	5	6	7	8	9
not at all logical				somewhat logical				very logical

2. At this point, how successfully do you think this course will be in raising the quality of your functioning?

1	2	3	4	5	6	7	8	9
not at all useful				somewhat useful				very useful

3. How confident would you be in recommending this course to a friend who experiences similar problems?

1	2	3	4	5	6	7	8	9
none at all confident				Somewhat confident				very confident

4. By the end of the course, how much improvement in your functioning do you think will occur?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Set II

For this set, close your eyes for a few moments, and try to identify what you really feel about the course and its likely success. Then answer the following questions.

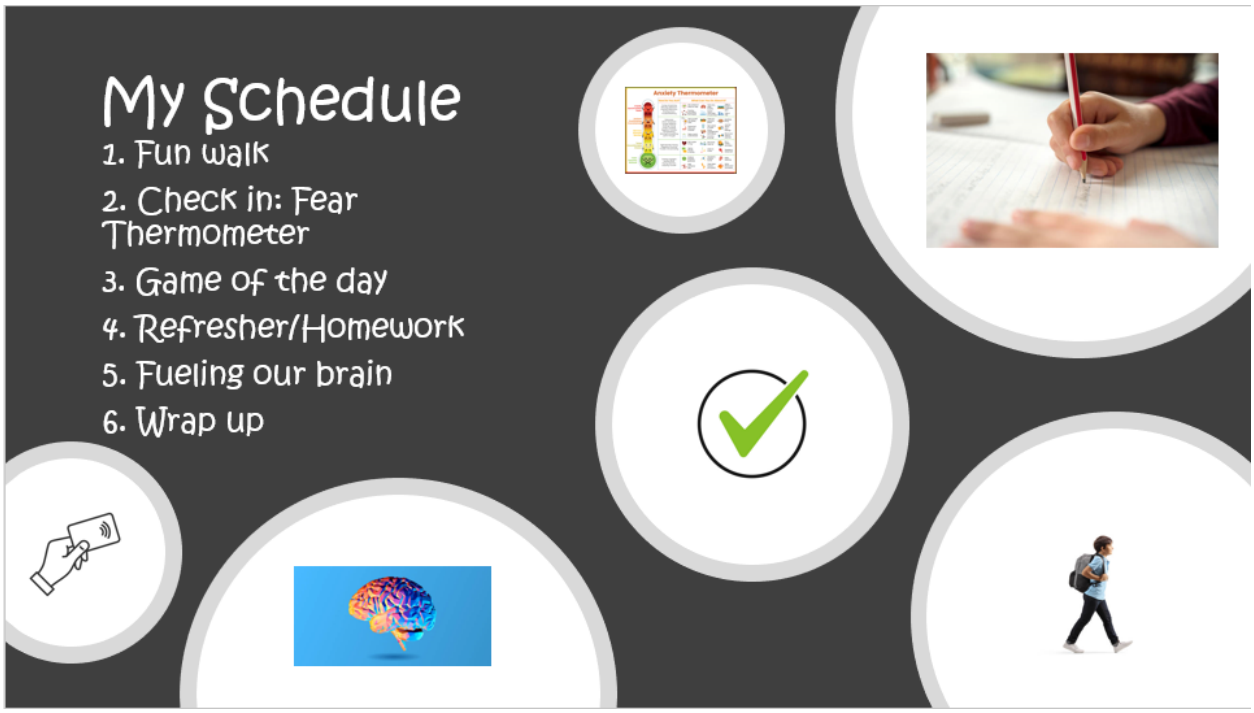
1. At this point, how much do you really feel that the course will help you to improve your functioning?

1	2	3	4	5	6	7	8	9
not at all				somewhat				very much

2. By the end of the course, how much improvement in your functioning do you really feel will occur?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Appendix E - Visual Schedule



Appendix F - Social Story

My name is _____. My favorite game is _____. My favorite class is_____.

Every week until May I meet with Mel. We talk about our worries. Everyone has worries. I am most afraid about _____.

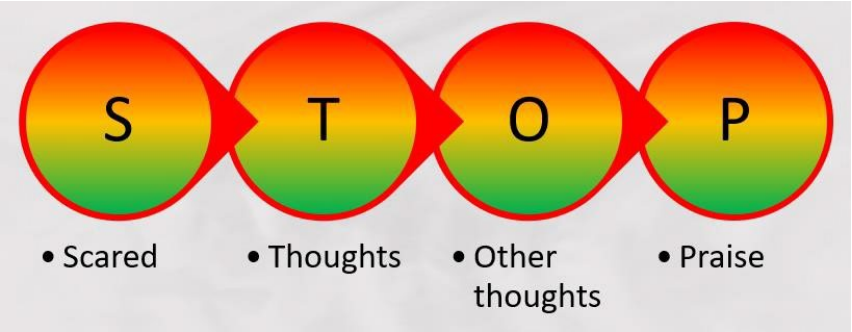
Worrying can get tiring. Although worries can be bad, sometimes worries can be good.

Alarms sometimes go off to let me know when there is danger.

False alarms go off whenever there feels like a danger, but there's really not one. An example of a false alarm is _____.

Real alarms go off when there feels like a danger, and there really is one. An example of a real alarm is _____. Mel and I will work on some ways that I can know if there is a real alarm or a false alarm.

When I am anxious, I can use some of my favorite fidgets like _____ or _____ to give me comfort.



I can also work on other techniques like the S.T.O.P. technique or other coping skills I learned in therapy.

If I have any questions or concerns, I can always talk to my _____.

Appendix G - Pre-intervention survey

I know what anxiety is now. (definitely, kind of, maybe, not at all)

I enjoy going to therapy. (definitely, kind of, maybe, not at all)

I can name at least 3 things about anxiety:

I use coping skills for my anxiety. (almost daily, often, sometimes, hardly ever)

I feel anxious (almost daily, often, sometimes, hardly ever)

I know how to cope with my anxiety (definitely, kind of, maybe, not at all)

There is good anxiety and bad anxiety (definitely, kind of, maybe, not at all)

An example of a false alarm is _____

An example of a real alarm is _____

Other feedback?

Appendix H - Post-intervention survey

I knew what anxiety was before. (definitely, kind of, maybe, not at all)

I know what anxiety is now. (definitely, kind of, maybe, not at all)

I enjoyed going to therapy. (definitely, kind of, maybe, not at all)

I can name at least 3 things I learned:

I plan to use some of the techniques I learned. (almost daily, often, sometimes, hardly ever)

I feel anxious (almost daily, often, sometimes, hardly ever)

I know how to cope with my anxiety (definitely, kind of, maybe, not at all)

There is good anxiety and bad anxiety (definitely, kind of, maybe, not at all)

An example of a false alarm is _____

An example of a real alarm is _____

Other feedback?

Appendix I – IRB Approval Letter

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office 252-744-2914 (@ · Fax 252-744-2284 (@ ·
rede.ecu.edu/umcirb/

Notification of Initial Approval: Expedited

From: Social/Behavioral IRB
To: Melissa Glenn
CC: Christy Walcott
Date: 2/17/2023
Re: UMCIRB 22-002534
Use of Modular Therapy to Treat Anxiety for School Age Students with Autism

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) occurred on 2/16/2023. The research study is eligible for review under expedited category # 7. The Chairperson (or designee) deemed this study no more than minimal risk.

As the Principal Investigator you are explicitly responsible for the conduct of all aspects of this study and must adhere to all reporting requirements for the study. Your responsibilities include but are not limited to:

1. Ensuring changes to the approved research (including the UMCIRB approved consent document) are initiated only after UMCIRB review and approval except when necessary to eliminate an apparent immediate hazard to the participant. All changes (e.g. a change in procedure, number of participants, personnel, study locations, new recruitment materials, study instruments, etc.) must be prospectively reviewed and approved by the UMCIRB before they are implemented;

2. Where informed consent has not been waived by the UMCIRB, ensuring that only valid versions of the UMCIRB approved, date-stamped informed consent document(s) are used for obtaining informed consent (consent documents with the IRB approval date stamp are found under the Documents tab in the ePIRATE study workspace);

3. Promptly reporting to the UMCIRB all unanticipated problems involving risks to participants and others;

4. Submission of a final report application to the UMICRB prior to the expected end date provided in the IRB application in order to document human research activity has ended and to provide a timepoint in which to base document retention; and

5. Submission of an amendment to extend the expected end date if the study is not expected to be completed by that date. The amendment should be submitted 30 days prior to the UMCIRB approved expected end date or as soon as the Investigator is aware that the study will not be completed by that date.

The approval includes the following items:

Name	Description
Beaufort Research Approval	Additional Items
BIRS	Surveys and Questionnaires
Child Consent Form	Consent Forms
Child SCAS	Surveys and Questionnaires
Dissertation Study Request Beaufort County	Recruitment Documents/Scripts
Dissertation Study Request ECU Community School	Recruitment Documents/Scripts
Parent Consent to Participate Form	Consent Forms
Parent SCAS	Surveys and Questionnaires
Parental Consent for Child Participation	Consent Forms
Pending Document	Additional Items
Recruitment Communication Email	Recruitment Documents/Scripts
Recruitment Flyer	Recruitment Documents/Scripts
SCARED (parent and child)	Surveys and Questionnaires
Teacher Consent to Participate Form	Consent Forms
TEI (CCQ)	Surveys and Questionnaires
USE OF MODULAR THERAPY TO TREAT ANXIETY FOR SCHOOL AGE STUDENTS WITH AUTISM	Study Protocol or Grant Application

For research studies where a waiver or alteration of HIPAA Authorization has been approved, the IRB states that each of the waiver criteria in 45 CFR 164.512(i)(1)(i)(A) and (2)(i) through (v) have been met. Additionally, the elements of PHI to be collected as described in items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.

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

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