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Strategies for Reducing Anxiety Symptoms in Children and Adolescents with Autism Spectrum Disorders

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**Strategies for Reducing Anxiety Symptoms in Children and Adolescents
with Autism Spectrum Disorders**

by

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Chapter 1: Introduction

Autism Spectrum Disorders (ASD) is a group of developmental disorders characterized by deficits in social communication and behavior. Individuals with ASD communicate, learn, behave, and interact differently than neurotypical persons (CDC; Centers for Disease Control and Prevention, 2016a). According to the CDC, 1 in 68 individuals are diagnosed with an ASD. Additionally, two-thirds of these children are diagnosed with one or more psychiatric disorders. One of the most common comorbid psychiatric disorders is anxiety (Autism Speaks, 2017a).

Children with ASD are often resistant to change, struggle with social interaction, and manifest these difficulties through disruptive, harmful behaviors (NIMH; National Institute of Mental Health, 2016). Having an additional diagnosis of anxiety disorder can heighten many of these symptoms and in turn, manifest more behaviors (Autism Speaks, 2017b). Adolescents on the spectrum who are higher functioning are more likely to experience anxious feelings due to their increased awareness of their environment and how others view them. Children who are lower functioning may experience less anxiety or have a harder time reporting their feelings, and therefore show fewer symptoms (Merrill, n.d.). The purpose of this paper was to examine treatments for reducing symptoms of anxiety in children with ASD at school and at home.

ASD History and Diagnostic Criteria

According to the National Institute of Mental Health (2016), ASD can be defined as a group of developmental disorders characterized by severe deficits in social communication and interaction, as well as, restrictive and repetitive behaviors. In order to be diagnosed with an Autism Spectrum Disorder, these deficits must be present during early childhood, cause

impairment in important daily functions, and cannot be explained by an intellectual disability (American Psychiatric Association, 2013).

Seven decades ago, Leo Kanner first described what is now known as Autism Spectrum Disorder with the words "early infantile autism" (Kanner, 1943). His description of the disorder was published in a paper titled, "Autistic Disturbances of Affective Contact" and was based on the cases of 11 children. He synthesized the cases into one factually-based description. Kanner found that the children were not worldly, were resistant to change, and showed deficits in the areas of verbal and nonverbal language (Kanner, 1943). He thought the repetitive behaviors he observed served a function: to keep sameness intact. Despite their deficits, Kanner believed the children had potential for normalcy. Based off their intelligence scores, he figured if they could balance their higher skill levels with their lower skill levels, they would function as a normal child (Volkmar & McPartland, 2014).

Following Kanner's (1943) original report, interest in autism grew. With this increase in interest came various perspectives including parental care as a cause of autism, as well as, autism being the first manifestation of psychosis (Volkmar & McPartland, 2014). In 1970, researchers agreed that autism should stand alone from other diagnoses such as schizophrenia during further studies. This consensus led to a new approach on diagnostic criteria that helped lead to the DSM-III. At this time, a new name for the category of disorder was implemented: Pervasive Developmental Disorder (PDD) (APA; American Psychological Association, 2017). Although autism focused on early development, other categories were included to classify cases at different developmental stages (Volkmar & McPartland, 2014).

Although the inclusion of autism in the DSM-III was a major step forward, there were several problems with the flexibility of diagnosis and inattention to developmental change in the criteria (APA, 2017). This led to thoughts of revision and the development of the DSM-IV. Many revisions were made to the DSM-III in what was called the DSM-III-R. Some of these changes included a name change from infantile autism to autism disorder, a change in structure to include 16 criteria in three major categories, and a revision to how to determine a diagnosis (Volkmar & McPartland, 2014). In order to make a diagnosis of autism, eight criteria had to be met. At least two criteria had to be met in the area of social communication, and at least one had to be met in the other two categories (Volkmar & McPartland, 2014). In both the DSM-III and DSM-IV, several disorders including Autistic Disorder, Asperger's Disorder, Childhood Disintegrative Disorder, and PDD-Not Otherwise Specified were listed as subtypes of the PDD category (APA, 2017).

As of May 2013, the DSM-5 abolished the four separate disorders and moved to diagnosing autism under an umbrella disorder: Autism Spectrum Disorder (American Psychiatric Association, 2013). Researchers found that diagnoses for the four disorders were not consistent between clinics and centers across the country. The hope for this dramatic change is that the criteria will provide a more accurate diagnosis. It is also believed that this system should not change the number of diagnoses made (American Psychiatric Association, 2013).

Individuals with ASD experience symptoms on a continuum. They often experience impairments in communication skills such as misreading facial expressions, responding inappropriately, misunderstanding nonverbal cues, and making friends (American Psychiatric Association, 2013). Individuals can also be resistant to change, have intense focus on certain

objects or topics, and make repetitive movements with their bodies (CDC, 2016a). The DSM-V criterion allows clinicians to take variations in symptoms and behaviors into consideration during the diagnosis process (Wing, Gould, & Gillberg, 2011).

Due to the move from four separate disorders to ASD, the DSM-V requires the level of severity to be identified for each individual. The level of severity is broken into three categories based on the level of support needed in the areas of social communication and restricted, repetitive behaviors (CDC, 2016b). Level 1 indicates the individual requires "support," Level 2 indicates the individual requires "substantial support," and Level 3 indicates the individual requires "very substantial support" (Autism Speaks, 2013). In addition to the level of severity, the DSM-V requires clinicians to specify if autism occurs with or without an intellectual impairment or language impairment, or if it is associated with another mental, genetic, neurodevelopmental, medical, behavioral, or environmental condition (CDC, 2016b).

Associated psychiatric disorders are often over diagnosed in individuals with ASD. The most common of these disorders are anxiety and Obsessive Compulsive Disorder (OCD). Many symptoms of ASD overlap with symptoms of these disorders which make them especially difficult to diagnose accurately. Psychiatric disorders like anxiety can often worsen the symptoms and behaviors associated with ASD, affect the educational success of the student, and reduce effectiveness of behavioral therapies (Autism Speaks, 2017b). Understanding common comorbid disorders along with ASD is crucial in providing appropriate treatment for each individual affected.

Treatment

Decisions regarding a child's treatment are often made by a team of individuals close to the child. This team might include parents, teachers, school administrators, school psychiatrists, and/or other clinicians. Treatment options often include behavioral interventions, medication, and counseling. Medications used for relieving symptoms of anxiety are recommended to be used along with counseling or another behavioral intervention (Autism Speaks, 2017b). Currently there are no medications approved by the Food and Drug Administration (FDA) to treat anxiety in children with ASD. However, some medications used to treat general anxiety in neurotypical individuals are used to treat children with anxiety. These medications include Prozac and Zoloft. Several studies suggest medications used to reduce anxiety are less effective for individuals with ASD (Ring, 2017). More success has been seen with treatments that are specifically designed for the individual diagnosed due to the uniqueness of each person on the spectrum (Merrill, n.d.). One of the most common behavioral treatments is Cognitive-Behavioral Therapy.

Cognitive-Behavioral Therapy (CBT). According to the Association of Behavioral and Cognitive Therapies (ABCT; Association for Behavioral and Cognitive Therapies, n.d.), CBT is a group of psychological treatments that are generally short term (6-20 sessions), evidenced-based, and help treat several disorders. CBT sessions focus on the interconnected thoughts, emotions, and behaviors of the client. The therapist and client work together to take step-by-step progress toward specific goals that are affecting the individual in the present time (ABCT, n.d.).

Therapy sessions differ slightly when the client is a child on the spectrum with an anxiety disorder. The goal is to take steps toward facing anxiety-triggering situations. Therapists often

use visuals and specific interests of the child to help focus each session (Merrill, n.d.). Overall, therapists work to change the thought process of the individual to in turn change behaviors.

Theater-based intervention. Theatre-based programs take various forms, but they all have one aspect in common: social communication and interaction. Children and adolescents with ASD all show deficits in social skills. Paired with an anxiety disorder, these impairments can be debilitating (Autism Speaks, 2017b). Theatre-based therapies help students face their fears while participating in a fun, social activity (Vanderbilt University Medical Center, 2015). Acting and performing teaches students facial expressions, emotions, theory of mind, and observation. The premise of the intervention is to get students to understand their peers and become more comfortable in social environments (Vanderbilt University Medical Center, 2015).

Role of the family. Parents and family members of children with both ASD and anxiety play a large role in treating symptoms. Not only are parents the ones that nurture their children, they can also be a coach, teacher, and therapist. Research by Judy Reaven was developed into an intervention training program for parents titled "Facing Your Fears." As part of the training, Reaven suggested several strategies for parents: understand your child's anxiety triggers (change in routine, lack of sleep, social situations), reward and model brave behaviors, ignore anxiety manifested in behaviors, show you are confident your child can self-manage their anxiety, and distinguish between realistic and unrealistic fears (Reaven, Blakely-Smith, Nichols, & Hepburn, 2011). Overall, parents know their child the best, and are just as important in the treatment process as teachers and clinicians.

Guiding Question

One primary question guides this literature review: How can special education staff better support students with Autism Spectrum Disorder who struggle with a comorbid anxiety disorder?

Focus of Paper

Eleven studies published between 2011 and 2017 were examined and chosen for inclusion in the Chapter 2 literature review. Studies were chosen if they evaluated the effectiveness of a specific intervention treatment used to reduce behaviors associated with anxiety in students diagnosed with ASD. Studies evaluating effectiveness of medication treatments were not included in the review. Lastly, studies were not limited to the United States, however, most studies were domestic in nature.

The Academic Search Premier and EBSCO databases were used in the search for peer-reviewed studies in the areas of ASD and anxiety disorders. Several keywords and keyword combinations were used in the advanced search: *Autism, comorbid disorders, anxiety disorder, Autism and anxiety.* In order to identify more relevant literature, the reference pages of four peer-reviewed studies were closely examined. Studies were chosen from both journals specific to the area of Autism, as well as journals from areas like education, psychology, music therapy, and pediatrics.

Importance of the Topic

Comorbid psychiatric disorders are some of the most common to be associated with an ASD diagnosis and can significantly increase phobias, obsessions, compulsions, or motor and vocal tics (Merrill, n.d.). Researchers have investigated treatments and interventions to reduce levels of anxiety in students with ASD, although this body of research has been conducted

primarily with Cognitive-Behavioral Therapy (CBT) as the focus. However, CBT is abstract

with a lack of visual cues for students. Students with ASD often show impairments in theory of

mind which can make CBT less effective (Merrill, n.d.).

As someone who struggles with anxiety myself, I know how hard it can be to function in

environments that are severely uncomfortable. During my time in several classroom

experiences, I have observed how these same anxiety symptoms have manifested themselves in

young individuals with ASD. Unlike a normally functioning adult, these students have little to

no coping mechanisms to help them get past these feelings. An understanding of the literature

specific to anxiety and ASD will help me better understand how to help my students find

strategies to reduce symptoms of anxiety and function better in their daily environments.

Definitions

Comorbid disorders are two or more disorders that occur in the same person. They can

occur at the same time or one before the other. Being comorbid also implies the disorders affect

one another in some way (National Institute on Drug Abuse, 2016).

Neurotypical describes an individual without autism or another neurological disorder

(Merriam-Webster, n.d.).

Theory of Mind refers to the inability of individuals on the spectrum to understand other

people's thoughts, feelings, attitudes, and opinions (Edelson, n.d.).

Trait Anxiety refers to a personality characteristic rather than a temporary feeling. A

higher level of trait anxiety creates more opportunities for state anxiety to occur (Hatfield, 2017).

State Anxiety refers to temporary feelings experienced in response to a perceived threat

(Hatfield, 2017)

Chapter 2: Review of the Literature

The purpose of this literature review was to examine the effects of cognitive behavior therapy and theater interventions on anxiety in children and adolescents with Autism Spectrum Disorder. This chapter summarizes each of the 11 identified studies. Studies are presented in chronological order beginning with the oldest study.

Literature Review

Corbett et al. (2011) examined the effects of a theatrical intervention program, Social Emotional NeuroScience Endocrinology (SENSE) on the socioemotional functioning and stress levels of children with autism spectrum disorder (ASD). Participants included eight children with ASD (seven boys, one girl) paired with eight neurotypical children (four boys, four girls) who were referred to as peers. The ages of the children ranged from 6 to 17. Participation in the program required families to attend the majority of 38 rehearsals and six performances of the musical production.

First, parents were asked to complete four parent questionnaires. The Social Responsiveness Scale (SRS) assesses characteristics of autism, the Stress Survey Schedule for Persons with Autism and Other Developmental Delays (SSS) assesses types of stress, the Short Sensory Profile (SSP) assesses sensory sensitivity, and Adaptive Behavior Assessment System (ABAS) assesses 10 areas of adaptive functioning. Children participated in all rehearsals which used video modeling, visual prompting, redirection techniques, and verbal cues. Cortisol samples were taken in six cycles (3 pre, 3 post). Parents took samples three times per day and samples were taken at the beginning and end of rehearsal times. Blood samples were also taken at the pre and post assessments for oxytocin (OT).

Within group analyses of parent reports showed no significant differences (all $p > 0.05$).

However, the results of the neuropsychological measures indicated statistically significant

differences in the identification of faces [$t(7) = -2.62$, $p = 0.034$], and Theory of Mind skills [$t(6)$

$= -2.73$, p = 0.34]. In contrast, identification of facial expressions showed only moderate

significance [t(6) = -1.12, p = 0.304]. As for cortisol levels, analysis revealed the most

significant change occurred between the first and middle rehearsals. The final rehearsal did not

show a significant difference in cortisol level. This suggests habituation forming during the later

rehearsals.

Researchers found no significant differences during the pre-post comparison of OT levels

or parent reports. It is unclear if these factors were not affected by the intervention or if the

sample size was too small to detect clear differences. Participants in the SENSE program did

show modest improvements in facial identification and theory of mind skills. Active practice

using these skills in several ways including video modeling and role playing may be a key factor

in developing perspective taking. Theatrical intervention shows promising results; however, this

particular study was limited by its sample size, lack of control group, and experimental design.

Guli, Semrud-Clikeman, Lerner, and Britton (2013) examined the Social Competence

Intervention Program (SCIP) for changes in social perception, social competence, and social

behaviors in a naturalistic setting. Each of these social areas contributes to the reduction of

anxiety symptoms in social situations. Thirty-nine youth (31 male, 8 female) participated in the

study. All participants came from middle class families and attended schools around the area of

a major southwestern city of the United States. All children were between the ages of 8 and 14.

Nineteen children had a primary diagnosis of ASD; nine were diagnosed with Nonverbal

Learning Disability (NLD), and 11 were diagnosed with Attention Deficit Hyperactivity

Disorder. All diagnoses were confirmed by a trained professional. Racial demographics for the

sample group were as follows: 36 participants were Caucasian, two were Hispanic, and one was

African-American. The first 23 students to meet all inclusion criteria were selected to be part of

the treatment group on a rolling basis creating a pseudo-random assignment. The comparison

group was matched by age and gender and was selected by using students who could not

participate in the treatment due to scheduling conflicts.

First, those who consented to observations had a 20 minute session conducted at their

home. Of the 17 who consented to an at home observation, eight treatment children and nine

control children were observed at school as well. Observation sessions were recorded by trained

professionals using partial interval recording with an audiotape. Observers looked for positive

social interaction, solitary behavior, and neutral behavior. These observations were conducted

both pre and post treatment. Next, parents and children were interviewed using four different

measures: SSRS, Behavioral Assessment System for Children (BASC), and Diagnostic Analysis

of Nonverbal Accuracy 2 (DANVA2). The treatment program consisted of 16 sessions each

focused on targeting a specific social competency skill. Each session was formatted in the same

way. They started with a warm up activity which was often cooperative in nature and followed

with a review of a challenge sent home from the previous session. Next, they participated in two

to three main activities selected for the target skill. At closing, they discussed the day's events

and a progress report was sent home to parents.

Effects of the BASC and DANVA measures were not significant. However, medium

effects were obtained for observed increases in social interactions ($R^2 = .21$) and decreases in

solitary behavior ($R^2 = .17$). This indicates improved generalized social interaction among the intervention group but not the control group. Parent interview data was consistent with these findings. One or more positive changes were reported by 75% of parents. Specifically, parents reported changes in their child's social functioning, including improvement in interpersonal relations, nonverbals, empathy, and self-control. Similarly, 82% of child participants reported feeling they better understood nonverbal cues, could more easily make friends, get along with others, and learn about others feelings.

Given the relatively small sample size, this study had medium to significant success at increasing social interaction and decreasing solitary play. Even more importantly, it is one of the first studies to show success in generalization among settings. Improvements were observed on the playground, in the gym, at home, and in the classroom. Observational data was important in measuring the generalization of skills. Attribution data suggested the age of drop out participants was higher than that of the participants that completed the program. This could be due to the nature of activities built into the intervention program. In the future, considerations could be made for changes in the program to fit the interests of a wider range of ages. Limitations of the study must be considered when looking at the significant results. Observers knew the diagnosis of each child which might have caused bias. Additionally, not all children were observed due to lack of personnel.

McNally Keehn, Lincoln, Brown, and Chavira (2013) examined the effectiveness of the Coping Cat program to reduce anxiety in children with Autism Spectrum Disorder in a randomized controlled trial. Twenty-two children between the ages 8 and 14 participated in the trial. All participants were diagnosed with ASD and a comorbid, clinical anxiety disorder. In

accordance with the Alliant International University Institutional Review Board, parents and children from the southern California area consented to participation in the program. All children had to meet the following criteria: diagnosis of ASD based on the Autism Diagnostic Observation Schedule (ADOS) and DSM-IV criteria, diagnosis of an anxiety disorder based on the Anxiety Disorders Interview Schedule--Parent Version (ADIS-P), Full Scale IQ at or above 70 confirmed by the Wechsler Abbreviated Scale of Intelligence (WASI), and English as the primary language. Participants were randomly assigned to either the 16-week treatment group or the 16-week waitlist group.

Shortly after initial contact with parents, a phone screening was conducted. Diagnostic and IQ measures were assessed at Alliant International University along with parent interviews using the Spence Children's Anxiety Scale (SCAS). All participants went on to complete 16 sessions of the Coping Cat program and seven exposure sessions. Some modifications were made to the Coping Cat program to better adhere to the diagnosis of the participants. Some modifications included a 10-15 minute review following each session, extended session times, additional visuals, and help with sensory or motor difficulties. The average percent of homework completed across treatment sessions was calculated to show homework compliance for each participant. Anxiety measures were administered within one week of completion of the program for both the intervention group and waitlist group. The same measures were also taken at a 2-month follow-up. Data were collected on pharmacological and psychosocial interventions for each participant.

According to the ADIS-P primary diagnosis ratings at post-treatment, 58% of participants in the treatment group no longer met criteria for their primary diagnosis. In contrast, 100% of

those in the waitlist group continued to meet criteria for their primary diagnosis ($p = .003$). A

significant main effect for time was found on the ADIS-P and parent-report SCAS-P measures

($p < .001; p = .01$). At the 2-month follow up, data were collected from 92% of treatment group

participants. According to the ADIS-P primary diagnosis ratings at post-treatment, 36% of

participants in the treatment group remained free of their primary anxiety diagnosis. Only one

participant relapsed and again met criteria for their primary diagnosis. A Number Needed to

Treat calculation was conducted using return to non-clinical levels for primary diagnosis. The

results indicated that about two children needed to participate in the Coping Cat program in order

for at least one child to return to non-clinical levels (NNT = 1.72).

Overall, results show promising evidence children with ASD who complete the modified

Coping Cat program experience a more significant reduction in anxiety symptoms than those

receiving no treatment or unmodified treatment. These gains are largely maintained after a

period of 2 months. Over half of all participants in treatment demonstrated remission in their

primary anxiety diagnosis. This finding is comparable to results of typically developing children

completing the Coping Cat program for a primary anxiety diagnosis and of findings of other

children with ASD completing alternate CBT interventions. Findings also suggest the Coping

Cat program may reduce symptoms of co-occurring internalizing and externalizing conditions.

Although these findings are significant, several limitations should be discussed. First, the

sample size was small, thus statistical findings should be interpreted with caution. Secondly, a

large amount of measures used in the study were parent reports which are not blind to treatment.

Lastly, delivery of the Coping Cat program was by the author of the study. It is unsure whether

or not these results can be generalized across all therapists. Future research should include a larger sample size, measures blind to treatment, and examination of treatment across therapists.

Corbett et al. (2014) reexamined the effects of the SENSE theater program on social interaction of youth with ASD through a two week summer camp model. Sixteen children attended the summer camp, however only 12 participated in the study. Nine participants were male, three were female, and all were between the ages of 8 and 17. Three were African American, seven were Caucasian, and two were Hispanic. Each participant had a diagnosis of Autism Disorder, Pervasive Developmental Disorder, or Asperger's Syndrome based on DSM-IV criteria. Diagnosis was corroborated using the ADOS measures. Lastly, intelligence was measured using the Wechsler Abbreviated Scale of Intelligence (WASI). Children were excluded from the study if they had a severe intellectual disability or if they showed frequent aggression toward themselves or others. Due to incomplete dependent measures, one participant was dropped from the study.

The research study began by obtaining consent from parents of participants and assent from the child participants. During the process of pretesting, peer actors were found to serve as peer models during the study. As a part of pre and post assessment, three different measures were taken: diagnostic, neuropsychological, and cortisol. Some of the measures used were the Social Communication Questionnaire (SCQ), Social Responsiveness Scale (SRS), A Developmental Neuropsychological Assessment (DNA), Parenting Stress Index (PSI), and Adaptive Behavior Assessment System (ABAS). Cortisol levels were measured at pre and posttest in several locations throughout the study including home, school, and theater rehearsals.

During the intervention stage, participants were paired one-to-one with a typically developing peer who underwent 3 days of peer training. Along with their peer, participants attended the theater program Monday through Friday for 2 weeks. Sessions were held only in the afternoon from 1:00 to 5:00. The schedule for each day was sent home to parents with 1 of 10 objectives. Each day, activities were focused on a core objective or skill. Most activities engaged participants through role playing, imaginative play, mirroring, and more. The remainder of theater sessions focused on rehearsing the play. At the end of the 2 weeks, participants and peers put on two evening performances open to the public.

The study used a pretest-posttest design for within-group comparisons. Results were reported using p values. Based on results from the Companionship Scale, children diagnosed with ASD showed an increase in active involvement with peers ($p = 0.027$). However, there was no significant difference in eye contact with peers ($p = 0.553$). Based on the neuropsychological measure, there was a significant change in Delayed Memory for Faces ($p = 0.002$) which indicates an increase in face identification memory. There were also significant differences in several other facial identifications measures which further support the improvement in ability to remember and identify faces. Significant differences were also found in other areas of social functioning including social awareness ($p = 0.043$) and social cognition ($p = 0.001$). Significant changes in adaptive skills were seen specifically in the areas of Home Living and Self Care. Parents also reported significant decreases in total stress. Regarding cortisol levels, reductions were seen as participants were reintroduced to the same experience multiple times. For example, significant reductions in arousal was measured between the first day and the second playground measure ($p = 0.004$).

Overall, the results of the 2-week intervention supports the hypothesis of the study regarding an increase in social interaction in youth diagnosed with ASD. However, gains in social interaction during the 2-week period did not generalize into the familiar setting of a playground. Participants showed interest in seeing and playing with peers from the theater program in a setting like the playground. The overall design and implementation of the study were strong. However, the sample size was small and testing a comparison group would strengthen the findings. Meaningful next steps for further study and program improvements include generalization and duration of treatment. By adding more peers into the study, it may improve carry-over into the natural environment. By extending the duration of treatment or adding a follow-up to the study, results will be strengthened.

Weiss, Viecili, and Bohr (2015) examined the effect of parent involvement on the effectiveness of Cognitive Behavioral Therapy on youth with ASD and comorbid anxiety. Participants were recruited between 2009 and 2011 through community education programs in an urban center. In order to be eligible, the child had to have a diagnosis of ASD from a child psychologist in the community they lived. The diagnosis was verified using the ADOS. Participants also had to have an average IQ above 80 on the WASI. All participants showed clinically significant levels of anxiety according to the Screen for Child Anxiety Related Emotional Disorders (SCARED). Children could not currently be involved in an intervention program related to anxiety, and no medication changes could occur during the course of treatment. Eighteen children with ASD and their parents ended up participating in the study. Children were between the ages 8 and 12 and consisted mostly of males (n = 15). It was mostly

mothers that filled out the parent questionnaire, and the majority were living with a spouse. Most parents had also finished a college degree.

Along with measures listed earlier, several parent and self-reports were used to assess child anxiety and parent stress. The CBCL: School Age Version 6-18 is a parent-report questionnaire that assesses current mental health problems exhibited by children. The Revised Children's Manifest Anxiety Scales (RCMAS) is used by the child to self-report feelings of anxiety. Lastly, the Parent Stress Scale (PSS) was used to assess levels of stress in parents. Most measures were completed pre and post treatment. For the treatment phase, participants were broken into four groups who received therapy from a trained therapist with 10 years of experience with the Coping Cat program. Each group received twelve weekly sessions lasting 1.5 hours. The manualized group program consists of behavioral approaches such as exposure, role play, and relaxation. They are taught direct coping mechanisms to help with reacting to anxiety, recognizing anxious feelings, and to utilize rewards and relaxation. Five adaptations were made to the program for the purpose of the study: concrete visual tactics, self-regulation, increased support, child-specific interests, and parent involvement

Measures were evaluated for significant changes on a group and individual level. RCI values were calculated to determine the magnitude of change. At the pre-treatment stage, all children were either borderline or clinical on the CBCL measure. On the SCARED measure, 82% of children were borderline or clinical; however, only two children were clinical on the RCMAS. At post-treatment, 33% moved to non-clinical on the CBCL, 53% moved to non-clinical on the SCARED total score, and 50% moved to non-clinical on at least one of the SCARED subscales. Scores on the CBCL and SCARED were significantly lower at post

treatment (r = -.35; r = -.42). This pattern extended through all SCARED subscales. However, little to no difference was seen between pre and post treatment on the RCMAS. On the CBCL, 33% of children were classified as either "recovered" or "improved," one child was "worsened," and one child was "deteriorated." On the SCARED total score, 35% were considered to be "recovered." One child was considered to be "worsened." Only 11% were "recovered" and 89% remained "unchanged" on the RCMAS total score. Regarding parent stress and child anxiety, a correlation was found between change in parent stress and the SCARED total scores, $r(17)$ = .50, p = .04. Another interesting finding was made; those who were unresponsive to treatment had parents with high stress levels during pretreatment.

Overall, these results indicate success in reducing anxiety in children with ASD and anxiety through a modified Coping Cat program. Specific types of anxiety were noted to have significant decreases along with overall anxiety. Child reported measures did not show a decrease in anxiety, but researchers think this may be an indicator or lack of awareness rather than a measure of actual treatment outcomes. Not only were decreases in anxiety found, but there was a significant relationship between change in parenting stress and change in child anxiety. These results were reflected in the SCARED only; however, there are more items on the SCARED than the CBCL therefore increasing the sensitivity of the measure and better reflecting changes. Although these outcomes are very similar to existing reports, several limitations were found. The sample size of the study was smaller than many existing studies. The study did not include a control group or randomization of participants therefore limiting statistical methods. There was not enough power to recognize small effects.

White, Schry, Miyazaki, Ollendick, and Scahill (2015) explored how verbal ability and severity of ASD may predict long-term outcomes for reducing anxiety after CBT interventions through a 1-year follow up. Eligible participants were between the ages of 12 and 17 years of age and had a diagnosis of ASD as evidenced by the ADOS. Participants had to be diagnosed with one or more anxiety disorders as evidenced by the Anxiety Disorders Interview Schedule for Children/Parents (ADIS). Lastly, participants had to have a verbal IQ of 70 or above. Participants were randomly assigned to either treatment or a waitlist group. At randomization, 30 participants were placed for the initial trial; however, eight were excluded from this analyses. Of 22 participants, 16 were male, 18 were Caucasian, one was Asian, two were African American, and one was labeled "other." The primary anxiety disorder diagnosis was Social Phobia.

Three measures were used to track changes in anxiety symptoms over time. The Child and Adolescent Symptom Inventory--4 ASD Anxiety Scale was given to parents and each item was rated on a scale of 0-3. The SRS was selected as the primary measure of ASD social disability to help support evidence for a relationship between anxiety and impairments in social communication. Lastly, the State-Trait Anxiety Inventory was a self-report questionnaire given to parents during the pretreatment phase. The questionnaire is rated on a 4-point scale.

In order to examine change in anxiety symptoms over time, paired samples t tests were used. As predicted, findings show decreased anxiety during the treatment period, with slight increases during the following year. Results from the CASI-Anx showed paired t tests significantly lower at post-treatment (1 year follow-up; $t(13 = 2.51, p = 0.026)$. Further analyses of the SRS and VIQ scores showed adolescents with high SRS scores had higher pretreatment

CASI-Anx scores. Similarly, the parental self-report score was a significant predictor of the Time 2 slope indicating that adolescents whose parents had higher rates of anxiety had less of an increase in anxiety after treatment.

Overall, results show that targeted CBT can produce long-term reduction of anxiety symptoms for adolescents with ASD. Anxiety symptoms did increase slightly following treatment; however, anxiety did not return to the severity during the pretreatment phase. Verbal ability showed to be a predictor of increased improvement during treatment. The severity of ASD predicted more severe anxiety symptoms pretreatment and greater success during treatment. The most significant predictor was parental trait anxiety. Participants whose parents showed more anxiety pretreatment had less increase of anxiety symptoms following treatment. Those with more severe ASD might have had greater long-term success due to the content presented during treatment. Targeted instruction on social skills and anxiety may reap more benefits for those children. As for limitations, sample size and reliance on parents to report data were significant. With this small of a sample size, it is hard to determine if these results would generalize to a larger population. Lastly, between the treatment phase and the 1-year follow-up, 16 participants had either dropped treatment or parents were no longer reporting data. Therefore, only 14 participants were analyzed for final results. Further studies should include more participants with several forms of assessment.

Storch et al. (2015) examined the effectiveness of an individualized, session-based CBT program in treating early-adolescents with high-functioning autism and a co-occurring anxiety disorder. Participants included 31 (majority male at 25) children between the ages of 11 and 16 who met the following criteria: a diagnosis of autism, Asperger's Syndrome, or PDD; a

comorbid anxiety diagnosis of separation anxiety, general anxiety disorder, OCD, or social

phobia; a score at or below 13 on the Pediatric Anxiety Rating Scale (PARS); and an IQ at or

below 80 based on the WASI. Anxiety diagnoses were determined using the ADIS. Each

participant had to have at least one anxiety disorder considered to be of clinical severity. If there

was more than one clinical diagnosis, the one with the highest rating would be considered the

primary diagnosis. The most common primary diagnosis among participants was social phobia.

Medications could not be changed during the enrollment weeks and had to be stable within the

6-8 weeks before starting the study. Lastly, participants could not be taking part in any other

intervention program or be actively suicidal.

Services for the study were provided at a university health clinic specializing in pediatric

anxiety. The study began with a phone screening and a diagnostic assessment for ASD. Several

measures were used to gain information about participants' anxiety. Clinician-rated measures

were administered by graduate-level evaluators who were blind to the conditions of the

intervention. Upon further analyses of the PARS assessment administration, the interrater

reliability was found to be high (correlation coefficient = .93). The intervention consisted of 16

weekly session of the modified BICA program used in Wood et al. The revisions were made to

make the sessions more relevant to early adolescents. Each session lasted between 60 and 90

minutes on a modular basis. Sessions were led by postdoctoral or doctoral students with at least

1 year of experience in child anxiety treatment. The therapist picked the topic each week based

off clinical appropriateness. At least three sessions needed to focus on coping skills and eight

sessions are exposure therapy. Other sessions are chosen based on the individual and focus on

adaptive skills, motivation, and social skills. Parents were included in most sessions to facilitate

open communication and generalization of skills. The sessions were concluded with a module

focusing on relapse prevention and continuing treatment. Participants who were randomized to

TAU chose either to participate in psychotherapy, pharmacological treatment, or no treatment for

the designated 16 weeks.

At post-treatment, significant differences were observed for all measures including the

PARS ($d = 0.79$), the ADIS CSR ($d = 1.30$), and CGI-Severity ($d = 0.94$). Participants in the

CBT treatment group responded to treatment at a rate of 68.8%. Only 26.7% of the TUA group

responded to their choice of treatment. Of those in the CBT treatment group, 37.5% no longer

met criteria for their primary anxiety diagnosis at post-treatment. No participants in the TUA

group showed signs of remission. Parents reported significant overall improvements in autism

functioning including awareness ($d = 0.75$), cognition ($d = 0.76$), and communication ($d = 1.13$).

At the 1-month follow up, no significant declines were detected in symptoms on any measure.

Significant changes were seen in communication ($d = 1.19$), cognition ($d = 1.55$), motivation

($d = 1.13$), and mannerisms ($d = 1.39$).

Overall, all anxiety measures show significant improvements in the overall functioning of

participants in the CBT group. While some students in the TUA group improved, no significant

improvements were observed overall. There were several limitations to the study. First, the

TUA group did not have specific treatment requirements and therefore there was no standard for

the treatment being provided to those participants. Second, the study was not powered to

examine treatment mediators and moderators. Third, the participant demographic did not include

diversity in gender or race. Lastly, the follow up period did not allow for examination of long-

term treatment effects. Further studies might analyze how parent involvement affects the results of treatment.

Corbett, Key, Fecteau, Newsom, Coke, and Yoder (2016) continued examining the effects of a peer-mediated theater-based program on the social competence of adolescent students with ASD. Researchers utilized a randomized experimental design to measure social ability by analyzing neural, cognitive, and behavioral measures, as well as aspects of the social competence framework such as social cognition, social interaction, and social functioning. Researchers hypothesized that children with ASD who received treatment would show more improvements in social ability across all areas of the social competence framework than those assigned to the waitlist group.

At randomization, 33 students were allocated to either a treatment group or waitlist. Three students in the waitlist group failed to return for post-testing. Therefore, the final sample for analysis included 30 children with high-functioning ASD between the ages of 8 to 14 years. Out of the 30 participants, 24 were male and six were female. There were a total of 21 Caucasian participants, one African-American, two Asian, four Hispanic, and 2 multiracial. All participants were on at least one medication with seven on two or more. Diagnosis of ASD was based on the DSM-V manual and established by a previous diagnosis, current clinical judgment, or corroboration by the ADOS. Criteria for selection also included an intelligence score of 70 or above (WASI).

The intervention period was split into multiple parts. The experimental group received treatment first over 10 days at four hours per session. Upon completion of follow-up, the waitlist group received intervention as a 10-week summer camp model. Two performances were held at

the end of intervention at the university's theater. Waitlist participants did not get follow-up testing. The intervention program was based on three components. The program began with providing peer training to neurotypical peers to help in facilitating the SENSE theater principles. The intervention itself was held during Saturday sessions. The schedule for each session was given ahead of time and displayed the core concept for each day. The first sessions consisted of role-playing, theatrical exercises, etc. During the third session, participants were introduced to the play and their roles. The remaining sessions focused on working on characters and rehearsing. Lastly, videos models were used to facilitate practice at home. The peer mentors recorded 20 videos displaying target behaviors. Participants were asked to practice using the videos for at least 15 minutes per day.

Data were analyzed with ANCOVA models. Results showed significant between-group differences on Memory of Faces Delayed which indicates that the theater intervention program results in improvements in social cognition for the treatment group. These findings also show significant improvement in memory for faces for a group of participants with ASD experiencing treatment through the program. Current findings indicate memory for faces is amenable to treatment and may be associated with naturally accompanying changes in social competence. Results also showed significant between-group difference in perspective taking established through theory of mind skills. Engagement in the theater exercises increased awareness of social cues and perspective taking. Similarly, significant between-group differences were shown in social communication based on two parent-report measures showing gains in home and in community environments.

Overall, participants in the SENSE theater program showed improvements in all social competency areas based on behavioral and neural measures. These findings extend previous findings on the SENSE program. The current reports support the use of the social interaction model. Future studies will focus on whether or not the results are due to a link between social cognition and interaction. Nevertheless, there are limitations to the study. Parent reports produced results that may overestimate the true score which favors the experimental favor. Group placement is known by parents and therefore inflates scores to favor the experimental group. Lastly, the study would have benefited from informants from outside the study such as teachers to measure the maintenance of results and generalization of social skills in the school and playground settings. Due to time factors, there was no follow up on dependent variables or beyond 2 months.

Conaughton, Donovan, and March (2017) examined the effectiveness of an internet-based CBT program on reducing the anxiety symptoms of students with high-functioning ASD. Participants in the randomized control trial included 42 Australian children between the ages of 8 and 12 with high functioning ASD. Thirty-six of the students were male while only six were female. All students were of Australian descent. All students were required to be diagnosed with one or more comorbid anxiety disorders. The majority of students' primary diagnosis was Social Anxiety disorder and the average number of comorbid disorders across the entire sample was 3.36. For ethical reasons, students meeting clinical diagnosis of depression were not included in the study. Children receiving treatment through another care provider were also not included in the study. Half of all participants were assigned to the treatment group and half were assigned to a wait-list control group.

Before the treatment period began, parents were required to provide information including age, gender, who was filling out questionnaires, marital status, combined income, highest level of education, and information on the child participant. Measures were conducted before intervention, after, and at a 3-month follow up. After measures were complete, the WLC was dismissed from the study. They were given access to the BRAVE online program. The program consists of 10 child sessions and six parent sessions, each lasting about 60 minutes each. Each session is completed weekly alongside weekly contact with a therapist through the online program. Two booster sessions are offered to be taken one month after treatment and three months after treatment. After all participants had completed the program, measures were taken again and data was analyzed using chi square, ANOVA, and MANOVA procedures.

In respect to pretreatment outcomes between the treatment and waitlist groups, no significant differences were found during the MANOVA analyses. At post-treatment, 20% of the treatment group were free of their primary diagnosis compared to 0% of waitlist participants. By the 3-month follow up, 38.9% of the treatment group was free of their primary diagnosis. In respect to all anxiety diagnoses, 10% of the treatment group was free of all anxiety diagnoses at post-treatment compared to 0% of the waitlist group. At the 3-month follow up, 16.7% of the treatment group were free of all anxiety diagnoses. Treatment satisfaction was also analyzed, and it was found that participants showed moderate satisfaction to the treatment program. Overall, significant improvements were made in general mental health of all treatment participants.

Compared to the previous study of the BRAVE ONLINE program with neurotypical children, results did not show the yielded remission rates researchers hoped for. One explanation

for these discrepancies could be the amount of time it took participants to complete the program. In the present study, almost half the amount of participants completed all 10 sessions within the weeks allowed. Another possible reason for the lower yields may be due to the timeline of follow-up measures. In the present study, the last follow up was at 3 months. In the previous study, a follow-up was done at 6 months which may have given more time for effects to be apparent and generalize across environments. Aside from these discrepancies, there were several limitations to the study. First, the tool used to diagnose ASD was not considered to be the "gold standard" for diagnosis. In future research, the ADOS--2 should be used to ensure more accurate diagnoses. Secondly, a limited number of participants actually completed all sessions. Due to the nature of the disability, an online program may be difficult for children to complete on their own without direction or organization skills. In future research, family characteristics should be taken into account to predict completion. Thirdly, there was no face-to-face CBT control group. Therefore, it is unknown if results indicated success with the unmodified program or if it was the online basis. Lastly, the lack of a control group during the 3-month follow up makes conclusions about successes at this point impossible to corroborate. Overall, future research on the BRAVE ONLINE program would be beneficial in strengthening the results of this study.

Corbett, Blain, Ioannou, and Balser (2017) examined the impact of the SENSE theater program on reducing anxiety and stress in children with Autism Spectrum Disorder. In total, 36 participants were recruited for the study. However, the final sample only included 30 youth with ASD between the ages 8 and 14. Out of the 30 total participants, 80% were male (13 in EXP and 11 in WLC groups). The majority of participants were Caucasian with 21 in total. Lastly, a total of 19 were on one psychotropic medication and seven were on two or more medications.

Treatment was provided to the EXP group 10 times during weekly sessions of 4 hours each. After treatment, the EXP group was assessed and the WLC group was given the treatment in 10 sessions. However, the WLC was not assessed after treatment. The methods and procedures for the treatment sessions are the same as explained in the previous Corbett summaries. Treatment included peer training, SENSE Theatre participation, and homework using video models. There were a total of 12 trained peers who were each paired with a participant. Peers and participants attended the SENSE theater program each Saturday from 1:00pm to 5:00pm at a local secondary school. Before and after treatment, participants were measured for anxiety using the STAI-C, and cortisol levels were monitored throughout. Additionally, group play was measured using formal observations by unbiased professionals using an established playground observation approach (PIP).

ANCOVA analysis procedures were used to evaluate the effect of treatment on anxiety levels in participants. Between-subject effects showed a significant on post STAI-C Trait $(F(1, 27) = 9.16, p = 0.005)$. No group effect was observed for STAI - C State $(F(1, 27) = 0.03, p = 0.86))$. A mediational analysis was conducted to test whether group play mediated change in trait anxiety levels. Changes in play did not show a significant effect on change in trait anxiety $(B = -0.32; CI = -3.35 \text{ to } 2.11)$. However, the direct effect of the intervention on trait anxiety remained significant $(B = -6.97; CI = -12.62 \text{ to } -1.31)$. As for stress levels, ANCOVA analyses showed significant changes in cortisol levels only at the beginning and end of the first and middle days of intervention (not on the final day). No significant differences were seen between days at the same time of day, on the playground, or before bedtime. Negative correlations were found between STAI-C Trait scores and cortisol levels during play $(r = -0.37, p = 0.047)$.

Additionally, there was a negative correlation between STAI-C Trait scores and the amount of time spent participating in group play ($r = -0.390$, $p = 0.03$).

Overall, results show treatment significantly affected the trait anxiety in the EXP group, but did not significantly affect state anxiety. Results relating to social competence and stress correspond to those found in previous research findings on the SENSE program. Results relating to anxiety and stress were consistent with previous research findings through other treatment programs. These results are important for the progress of the SENSE theater program. However, there were several limitations to this study. First, STAI-C indicators may not have been accurate for state anxiety due to lack of ability to self-report emotional states by children with ASD. Secondly, the type of intervention limited the sample size available for the study. By assessing multiple cohorts, a bigger sample size could have been used to strengthen the results. Lastly, cortisol measures are helpful to the study, but the strong variability between and within subjects needs to be taken into account when discussing the significance or results. Future studies should address these limitations.

Murphy et al. (2017) examined the effectiveness of CBT to reduce anxiety in children with ASD compared to person-centered counselling. This pilot randomized controlled trial consisted of two studies using the Multimodal Anxiety and Social Skill Intervention for adolescents with ASD (MASSI) and counselling provided by the NHS in the United Kingdom. Assessments were given at three points: baseline, within 4 weeks of treatment completion, and at a 12-week follow-up. Participants were randomized by a statistician unconnected to the study and all assessment measures were collected by an unbiased, independent assessor.

Participants were children, adolescents, and their parents who attend clinics in southern England. All children between the ages 12 and 18 who were referred to the clinic between April, 2011, and April, 2013, with a diagnosis of ASD and anxiety were invited to participate in the study. Participants were required to meet diagnoses based on the ADOS, ADI-R, and ADIS. Additionally, the MASSI program requires an age of 12-17 with an IQ above 70. In the UK, children with ASD without a co-occurring learning disability attend a mainstream school. Students with ASD who do have a co-occurring disability attend a special school. Therefore, a requirement for participants was to be currently or recently attending a mainstream school. Participants were excluded for a variety of disorders not supported by the MASSI program as well as if they were receiving therapy elsewhere. As part of the treatment process, five clinicians provided either CBT, counselling, or both. Two clinicians provided CBT only to four participants each. Additionally, two clinicians provided only counselling services; one to six participants, and one to five participants. Lastly, one clinician provided CBT to nine participants and counselling to eight participants. All clinicians received supervision. In total, 17 participants were allocated to CBT treatment and 19 to counselling services.

During the treatment phase, all participants were offered 12 individual sessions, one booster session, and five group sessions. The MASSI CBT program aims to reduce anxiety and provide supplementary strategies for social skills deficits. The supportive counselling services aimed to build relationships with participants and encouraged participants to express their feelings using reflective listening, supportive statements, clarification and empathy. These interventions did not focus on physical symptoms or cognitions, but instead dealt with anxiety as

it was raised by the client. For example, if an individual raised anxiety in terms of relationships,

they would explore the relationship itself, but not the symptoms.

Analyses of both primary (ADIS) and secondary (SRS) outcome measures were

conducted on intention to treat. ANCOVA procedures were used to compare scores between the

treatment groups. Attendance of intervention sessions was significantly different between

groups. The mean number of individual sessions attended for the CBT group was 9.06 and for

counselling it was 11.71 ($p = 0.02$). Treatment fidelity was measured using the Primary Care

Therapy Process Rating Scale (PCTPRS). On the CBT subscale of this measure, the mean score

for the CBT sessions was 25.88 while the counselling group scored 9.62. These results are

highly significant ($p < .0001$). On the counselling subscale, the CBT mean score was 15.76 and

counselling was 20.81, also a highly significant difference ($p < .001$). These results show that

the therapists were faithful to the interventions they provided. Outcome measures show no

significant differences between pre and post tests for all anxiety types except for separation

anxiety. However, these results should be interpreted with caution due to the small sample for

this anxiety type. Results remained insignificant at the 12-month follow-up for all anxiety types.

Overall, no significant differences were found between the effects of the CBT treatment

and the counselling interventions. These findings are consistent with previous findings for

anxiety treatment for adults. However, few studies have examined the same comparisons. It is

important to note, these findings do not implicate either intervention as being unsuccessful in

treating anxiety. Rather, it shows neither intervention is superior to the other. The significant

difference in individual attendance between both groups could have had an effect on these

findings. One limitation to this study is the sample size. As a pilot study, the sample size was

fairly small and subtler differences may have been detected with a larger sample size. Further

studies might compare CBT with another intervention using a larger sample size.

Table 1

Summary of Chapter 2 Findings

Authors	Study Design	Participants	Procedure	Results
Corbett, Gunther, Comins, Price, Ryan, Simon, Schupp, & Rios (2011)	Quantitative	Eight children with ASD paired with eight neurotypical children between the ages of 6 and 17.	Participants engaged in a musical theatre program aimed at reducing stress and increasing social communication.	● Improvements were made with facial identification and theory of mind. ● Shows potential in improving social communication with the support of peers and behavioral modeling.
Guli, Semrud-Clikeman, Lerner, & Britton (2013)	Quantitative	Thirty-nine children (19 diagnosed with ASD, nine diagnosed with NLD, and 11 diagnosed with ADHD) between the ages 8 and 14 from cities around the southwest region of America.	Families completed pre and post-test measures. Children participate in a 16-session drama intervention program involving process dramas and improvisation activities. Parents also complete an interview to provide qualitative data.	● Results show improvements in positive interaction and decreased solitary play. ● This study is among the first to show evidence of generalization of treatment. Improvements observed in gym, playground, and the cafeteria.

Table 1 (continued)

Authors	Study Design	Participants	Procedure	Results
McNally Keehn, Lincoln, Brown, & Chavira (2013)	Quantitative	Twenty-two children between the ages of 8 and 14 with ASD and clinical anxiety from Southern California.	Participants engaged in 16 sessions of CBT according to the Coping Cat program.	● 7 of 12 participants in the CBT intervention no longer met criteria for their anxiety diagnosis post treatment while all waitlist participants still met criteria. ● After two months, 36 percent maintained freedom from their diagnosis while the rest showed statistical differences in anxiety scores.
Corbett, Swain, Coke, Simon, Newsom, Houchins-Juarez, Jenson, Wang, & Song (2014)	Quantitative	Twelve youth ages 8 to 17 with ASD paired with a trained, typically developing peer. One participant did not finish the program leaving 11 participants.	Participants engaged in a 2-week summer camp model of the popular SENSE theater intervention program.	● Increased interaction with familiar peers increased while interaction with unfamiliar peers remained stable. ● Results matched previous findings that showed improvements in core social deficits in ASD which heighten anxiety.
Weiss, Viecili, & Bohr (2015)	Quantitative	Eighteen children age 8 to 12 years diagnosed with ASD and anxiety with their parents. The majority of questionnaires were filled out by the mothers.	Parents participated with their children in a 12-session group "Coping Cat" intervention. Parents also completed the Child Behavior Checklist and a parent report.	● Significant reductions were noted across anxiety areas reported by parents. ● Significant correlations were found between parent stress and child anxiety.

Table 1 (continued)

Authors	Study Design	Participants	Procedure	Results
White, Schry, Miyazaki, Ollendick, & Scahill (2015)	Quantitative	Twenty-two adolescents between 12 and 17 years of age with ASD and one or more anxiety disorders.	Participants attended about 12 individual sessions of CBT and seven group social skills sessions. Parent coaching was done throughout all sessions. Participants were assessed again one year later.	● Treatment showed improvements in anxiety symptoms in adolescents. ● ASD severity predicted more severe anxiety pretreatment with greater improvement following treatment.
Storch, Lewin, Collier, Arnold, De Nadai, Dane, Nadeau, Mutch, & Murphy (2015)	Quantitative	Thirty-one children ages 11 to 16 with ASD and clinical anxiety.	Each child participated in 16 weekly, individual sessions of a developmentally modified CBT program of 60 to 90 minutes.	● The personalized treatment significantly reduced symptoms of anxiety. ● Responders to the intervention maintained gains over a one-month period.
Corbett, Key, Qualls, Fecteau, Newsom, Coke, & Yoder (2016)	Quantitative	Thirty children between the ages 8 and 14 with ASD.	Participants in the treatment group attended 10 four hour long sessions of the SENSE theater program with peer assistance.	● Group effects were seen in social ability, communication, group play with toys, memory of faces, and theory of mind. ● At two months, the group maintained communication skills.
Conaughton, Donovan, & March (2017)	Quantitative	Forty-two children with high-functioning ASD between 8 and 12 years of age with an anxiety disorder with their parents.	Children and their parents participated in an online-based CBT program called BRAVE-ONLINE. Two booster sessions were completed at one and three months after completion of the program.	● Participants in the treatment group showed significant reduction in clinical severity and reported anxiety symptoms compared to the waitlist group. ● Overall functioning increased after treatment.

Table 1 (continued)

Authors	Study Design	Participants	Procedure	Results
Corbett, Blain, Loannou, & Balser (2017)	Quantitative	Thirty youth between 8 and 14 years of age with ASD.	Children participated in four hour sessions of the SENSE theater program. Anxiety and cortisol measures were assessed throughout the program.	• Improvements were shown in social competence. • Social interaction with peers reduced the levels of trait-anxiety seen in children involved in the treatment group.
Murphy et al. (2017)	Quantitative	Participants were children, adolescents, and their parents who attend clinics in Southern England. All participants were between the ages 12 and 18.	After measures were given, all participants received either CBT or counselling services through 12 individual sessions, one booster session, and five group sessions.	• No significant differences were found between or within groups. • Neither treatment could be proven more effective on reducing anxiety than the other.

Chapter 2 Summary

This concludes the literature review of 11 studies that examined the effect of CBT and theater interventions on anxiety in children and adolescents with ASD. Conclusions and recommendations are discussed in Chapter 3.

Chapter 3: Conclusions and Recommendations

The purpose of this research paper was to analyze the effectiveness of two different approaches to reducing anxiety symptoms in children and adolescents with Autism Spectrum Disorder. Chapter 1 provided background information on the disabilities and strategies while Chapter 2 presented a review of the literature. In this chapter, I provide a review of findings, recommendations for future research, and implications for practice.

Conclusions

I reviewed 11 studies that examined whether or not certain treatments affect anxiety symptoms in children and adolescents with ASD. Specifically, four of the students examined the effectiveness of theater based intervention using the SENSE theater model (Corbett et al., 2011; Corbett et al., 2014; Corbett et al., 2016; Corbett et al., 2017), and one using the Social Competence Intervention Program (Guli et al., 2013). The remainder of the studies examined the effectiveness of reducing anxiety using Cognitive Behavioral Therapy (Conaughton et al., 2017; McNally Keehn et al., 2013; Murphy et al., 2017; Storch et al., 2015; Weiss et al., 2015; White et al., 2015).

All but one of the studies examining the SENSE Theater program evaluated overall social interaction and stress (Corbett et al., 2011; Corbett et al., 2014; Corbett et al., 2016). The fourth study also evaluated anxiety symptoms (Corbett et al., 2017). Of the remaining studies, two evaluated the Coping Cat CBT program (McNally Keehn et al., 2013; Weiss et al., 2014), and four evaluated other formats of CBT methods (Conaughton et al., 2017; Murphy et al., 2017; Storch et al., 2015; White et al., 2015).

SENSE Theater. All four studies that examined the SENSE program were found to improve overall social communication and, in turn, improved social anxiety in students. Corbett et al. (2011) concluded that improvements in facial identification and theory of mind skills may be due to active practice using a variety of methods including video modeling and role playing which are key factors in developing perspective taking. In an additional study, Corbett et al. (2014) asserted similar findings with changes in adaptive skills specifically in the areas of Home Living and Self Care. As time went on, Corbett et al. (2016) continued to come to the same conclusion that the SENSE program improved overall social competence including significant differences in awareness of social cues and perspective taking. In the most recent study of the SENSE program, Corbett et al. (2017) examined the effects of the program on anxiety, and concluded there is a direct effect of the intervention on trait anxiety levels in children.

Other Theater-Based Interventions. Out of the 11 studies reviewed, one study examined the Social Competence Intervention Program (SCIP). Guli et al. (2013) looked for changes in social perception, social competence, and social behaviors in a naturalistic setting. Conclusions suggest improvements in generalized social interaction among the intervention group, but not the control group. Parents' reports corroborate observational findings by reporting changes in their child's social functioning including improvements in interpersonal relations, nonverbals, empathy, and self-control.

Coping Cat CBT. In both studies that examined a modified version of the Coping Cat program, children were found to experience more significant reductions in anxiety symptoms than those receiving no treatment or an unmodified treatment. McNally Keehn et al. (2013) concluded that Coping Cat had the ability to abolish primary anxiety diagnosis in children and

maintain these gains after a 2-month period. Weiss et al. (2015) found parent involvement in the Coping Cat program to be effective in reducing anxiety in children. However, the results were lessened as stress levels in parents increased.

Other Cognitive Behavioral Therapies. Four studies used other CBT methods to improve anxiety symptoms in children. All of these studies included a randomization component to a control or comparison group. Out of the four studies, three used an individual or group, in-person CBT method (Storch et al., 2015; Murphy et al., 2017; White et al., 2015). The remaining study used an internet-based CBT method (Conaughton et al., 2017).

White et al. (2015) asserted verbal ability is a predictor of increased improvement during and after treatment. Additionally, results show that targeted CBT is successful in producing long-term reduction of anxiety symptoms for adolescents with ASD. Storch et al. (2015) had similar conclusions showing significant improvements in overall functioning of participants receiving CBT. Some students in the control group showed slight improvements, but there were no overall improvements observed. Lastly, Murphy et al. (2017) concluded CBT was effective in reducing anxiety in children and adolescents, however, there were no significant differences between the effects of CBT and counselling interventions. In regard to internet-based methods, Conaughton et al. (2017) found treatment results did not yield remission rates nearly as high as hoped for; however, there were moderate improvements made in the general mental health of all treatment participants. The varying durations, sample sizes, and treatment design may contribute to differences in results between each of these studies.

Recommendations for Future Research

Further research in the area of autism and comorbid anxiety must continue. Specifically, attention should be directed toward sample size and research design. All 11 studies listed sample size as a possible limitation. Many of the studies reviewed had 30 or less participants assigned to a group. Small sample sizes can affect the strength of results obtained from a study. Without representation of a larger population, results may not be generalizable. Additionally, the research design of several studies did not include a control group or comparison group. Without the results of a control group, it is unknown whether results show significant implications.

Another limitation to current research is the use of biased report measures and assessments. In the case of White et al. (2015), parent reports made up a significant amount of the data used for analyses. Parents are not blind to the diagnoses of their child or the methods of the study and therefore might indicate the results they are expecting from the treatment. Similar limitations were seen in McNally Keehn et al. (2013) and Guli et al. (2013). Further research should use unbiased methods of reporting and observing.

Lastly, future research could benefit from longer follow-up periods. Many of the studies reviewed had either no follow up, a 1-month follow-up, or a 3-month follow-up. The majority did not follow up at a time greater than 3 months. By obtaining data further after treatment, generalization and maintenance of treatment outcomes can be better measured.

The problem that stands out the most to me after conducting a review on current literature is the lack of treatment methods available for students with ASD. Although theater-based interventions and CBT both show their own merits, modifications to these programs seem to be

needed to give the best results. Until more studies of this nature are available, results of these studies should be interpreted with caution.

Implications for Current Practice

As an educator, it is not my job to provide counselling or psychological services for my students; however, it is my responsibility to make my students feel safe in their educational environment. In doing so, I need to consider students who may have mental health needs throughout the day. By implementing certain concepts from CBT programs and theater-based intervention into my classroom, there is a possibility of reducing anxious feelings throughout the day.

It could be argued that these types of treatments should be carried out by a school psychologist, therapist, or other clinician. However, school psychologists tend to have crammed daily schedules with only 10 to 15 minutes allotted for each student on a biweekly basis. Similarly, therapists are often seen outside of the school day and can cost a lot of money for families. By using certain principles of these intervention programs in the classroom, results may be obtained quicker and may more easily generalize to environments the student is most familiar with.

Treatments that resulted in significant improvements in reducing anxiety in students all required some sort of training. I am unaware of the extent of these trainings, but it can be assumed they may cost money and will take time out of a teacher's day. However, there are many books and resources available online about CBT and theater-based interventions that cost little to the individual or school. Certain principles from these books can be implemented into social skills teaching methods already used in the classroom. For example, video modeling and

role playing are popular methods for teaching social skills in classrooms. By modifying these lessons to target areas of anxiety in students and using a theater-based model, anxiety may be reduced. Similarly, by having group conversations about worries and practicing on letting those worries float into the air may have similar results.

Although it may seem easy to implement CBT and theater into the special education, there is no research to support the use of these methods in the classroom. Therefore, by modifying to include principles from research-based interventions may not result in the desired effects and should be used with caution.

Summary

The findings of these 11 studies were somewhat variable, but all showed at least moderate improvements in anxiety symptoms. Modified CBT programs and theater interventions are just beginning appear in the literature. In my limited teaching experience, I have seen many students with ASD struggle with their anxiety into adulthood with no interventions showing significant improvements. Cognitive Behavior Therapy and theater-based interventions may be the answer to many student mental health needs.

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