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# The Effectiveness of a Computer-Assisted, Cognitive-Behavior Program for Treating Anxiety Symptoms in Children with Autism Spectrum Disorder

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Running head: COMPUTER-ASSISTED CBT FOR ASD AND ANXIETY

Philadelphia College of Osteopathic Medicine

Department of Psychology

THE EFFECTIVENESS OF A COMPUTER-ASSISTED, COGNITIVE-BEHAVIOR  
PROGRAM FOR TREATING ANXIETY SYMPTOMS IN CHILDREN WITH  
AUTISM SPECTRUM DISORDER

By Jennifer A. Zabel

Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Psychology

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**PHILADELPHIA COLLEGE OF OSTEOPATHIC MEDICINE  
DEPARTMENT OF PSYCHOLOGY**

**Dissertation Approval**

This is to certify that the thesis presented to us by **Jennifer A. Zabel** on the **8th** day of **April, 2015**, in partial fulfillment of the requirements for the degree of Doctor of Psychology, has been examined and is acceptable in both scholarship and literary quality.

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### **Abstract**

Autism Spectrum Disorder (ASD) is a complex and multifaceted, neurodevelopmental disorder that severely impacts children and families across a variety of settings. Prevalence rates of ASD are continuing to increase rapidly, with sizeable intervention and treatment costs placed on families and society. Further complicating the matter, many individuals with ASD also evidence co-occurring anxiety symptoms or disorders and tend to be at a higher risk for developing such problems when compared to other clinical populations or typically developing children. This study investigated the effectiveness of a computer-assisted CBT program, Camp Cope-A-Lot (CCAL), in regards to reducing anxiety symptoms in four participants diagnosed with ASD. Data from quantitative measures revealed inconsistent results, yet informal, qualitative feedback from parents as well as information from the researcher's observations and progress notes appeared more promising for use of the CCAL intervention for this population of children.

*Keywords:* autism, anxiety, cognitive behavior therapy

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## Chapter 1: Introduction

Children and adolescents with Autism Spectrum Disorder (ASD) exhibit impairments in social interaction, in verbal and nonverbal communication, and present with repetitive and restrictive interests and behaviors (American Psychiatric Association [APA], 2013). Symptoms of this disorder often are present prior to age 3 years and can range from mild to severe characteristics, hence the use of the term “spectrum disorder.” Regardless of the level of severity, these deficits are often pervasive, impacting children and families not only at home, but also in educational and social environments (Chalfant, 2011; Chalfant, Rapee, & Carroll, 2007).

Research on the causes of ASD remain inconclusive, yet the prevalence rates for these disorders have been increasing at a rate of 10% to 17% annually with estimates as high as one in every 88 children being diagnosed with an ASD (Centers for Disease Control [CDC], 2008). Current intervention costs to families, communities, and health care systems range from approximately \$40,000 to \$60,000 each year per child (CDC, 2011), which is estimated to cost over \$1.4 million over the child’s lifespan when comorbid intellectual disabilities are not present (Autism Speaks, 2012).

Despite these high costs to families and society, very few children with ASD grow to be adults that are gainfully employed and live independently (Howlin, Goode, Hutton, & Rutter, 2004). In fact, adults with ASD are employed less frequently, when compared with adults with other disabilities (Standifer, 2012). As will be discussed, problems with anxiety, and in some cases, the presence of comorbid anxiety disorders can be debilitating for this population and may account for a major portion of this impasse. As this growing population of children continue to enter our schools,

communities, and eventually the workforce, it will become increasingly important to determine effective, evidence-based treatments and interventions in order to promote independence and adaptive behavioral performance within these settings (White, Oswald, Ollendick, & Scahill, 2009a).

### **Statement of the Problem**

Anxiety disorders include some of the most common mental health problems exhibited in youth, with prevalence rates ranging between 3% and 20% (Albano, Chorpita, & Barlow, 2003). In fact, children and adolescents are most frequently referred for mental health services due to problems with anxiety (Tomb & Hunter, 2004). ASD is a complex, multifaceted disorder and results across multiple studies consistently have revealed anxiety disorders to be the most commonly co-occurring disorder among children with ASD (Anderson & Morris, 2006; Gillott & Standen, 2007; Lang, Mahoney, El Zein, Delaune, & Amidon, 2011; Leyfer et al., 2006; Reaven et al., 2009; Sze & Wood, 2007). Children and adolescents diagnosed with ASD appear to demonstrate an increased risk for developing anxiety symptoms or an anxiety disorder, when compared with other clinical populations (Bellini, 2004; Chalfant, Rapee, & Carroll, 2007) as well as typically developing children (Gillott, Furniss, & Walter, 2001; Kim, Szatmari, Bryson, Streiner, & Wilson, 2000; Reaven et al., 2009). Currently reported prevalence rates are variable, ranging from 11% to 84% (Chalfant et al., 2007; Lang, Regeher, Lauderdale, Ashbaugh, & Haring, 2010; Reaven et al., 2009; Sze & Wood, 2007; White et al., 2009b). Negative impacts related to anxiety may include withdrawal from social interactions, poor school or occupational performance, disturbances in eating or sleeping,

avoidance of particular stimuli or situations, and/or health problems due to increased levels of stress (APA, 2013).

Early detection and intervention for such problems in young children and adolescents has been shown to decrease anxiety symptoms and also to prevent the development of more serious mental health problems in adulthood (Tomb & Hunter, 2004). Based on this information, youth with ASD and co-occurring anxiety problems may require particular attention and targeted intervention to achieve positive outcomes similar to that of their non-disabled peers. Despite numerous research efforts, there is currently no cure for ASD (CDC, 2011). However, many associated symptoms, such as problems with anxiety, are treatable (Reaven et al., 2009) and the treatments that are effective may decrease the overall presentation and level of severity of the primary disability of ASD (Barnhill, 2007).

The use of Cognitive-Behavioral Therapy (CBT) has been documented in numerous studies as a highly effective treatment for anxiety disorders (Barlow, 2000; Barrett, Duffy, Dadds, & Rapee, 2001; Kendall, 1994; Khanna & Kendall, 2008; Silverman et al., 1999). Only recently have researchers begun to address the use of CBT with children who have ASD and comorbid anxiety symptoms or disorders (Donoghue, Stallard, & Kucia, 2011; White et al., 2009a). Several modifications, such as the use of visuals and decreasing language demands, have been implemented to better accommodate the unique needs of this population (Anderson & Morris, 2006; Chalfant et al., 2007; Reaven et al., 2009; Sofronoff, Attwood, & Hinton, 2005; Sze & Wood, 2007). Furthermore, computer-based and computer-assisted CBT treatments are being utilized increasingly as alternative methods to the traditional delivery of mental health services

(Cunningham, 2008; Khanna & Kendall, 2008), especially when attempting to meet the mental health needs of children and adolescents (Goodwin, 2008). Many studies have articulated the benefits of using technology with children with ASD for increasing social skills, communication, and a variety of academic learning activities (Goldsmith & LeBlanc, 2004; Goodwin, 2008). As such, the delivery of computer-based or computer-assisted CBT for this population may serve as a viable and effective treatment option for decreasing secondary anxiety symptomology. Additional research in this area is needed in order to treat this increasingly growing group of children and adolescents more effectively. At present, the existing research appears promising for the use of CBT as a possible intervention for treating anxiety symptoms associated with this complex disorder (Anderson & Morris, 2006; Chalfant et al., 2007; Reaven et al., 2009; Sze & Wood, 2007; White et al., 2009a/b; Wood et al., 2009). The current study investigated the following research questions:

*Research Question 1:* Does implementation of the computer-assisted, Camp Cope-A-Lot (CCAL) intervention reduce overall symptoms of anxiety in children with ASD?

*Research Question 2:* Does treating anxiety symptoms with the CCAL intervention decrease overall symptoms of ASD in participants?

*Research Question 3:* Does the CCAL intervention improve executive function skills in children with ASD and anxiety symptoms?

## Chapter 2: Review of the Literature

Autism Spectrum Disorder (ASD) is a complex and multifaceted neurodevelopmental disorder. As such, children and adolescents diagnosed with ASD may present with an array of symptoms, including but not limited to sensory processing problems (Rogers & Ozonoff, 2005), sleep disturbances, cognitive impairments (APA, 2013), and/or self-injurious behaviors (Carr, 1977). Difficulties with attention and appropriate regulation of emotions and behaviors are also commonly observed across age groups in individuals with autism (Lainhart, 1999). Of growing importance in the literature as well as in actual mental health settings working with children with ASD, is the prevalence of co-occurring or comorbid psychiatric symptoms or disorders present in this population. Leyfer and colleagues (2006) found that 72% of the children in their study met criteria for at least one DSM Axis I disorder, and 30% of the sample exhibited symptomology consistent with two or more additional psychiatric disorders.

Additionally, individuals with ASD are approximately twice as likely to demonstrate symptoms of a comorbid psychiatric disorder within twelve months of receiving their initial diagnosis, when compared with other clinical populations (Simonoff et al., 2008).

Results across multiple studies consistently revealed anxiety disorders to be the most common co-occurring disorder among children with ASD (Kim, Szatmari, Bryson, Streiner, & Wilson, 2000; Leyfer et al., 2006; Reaven et al., 2009), despite exclusion of anxiety symptoms from diagnostic criteria in previous and current versions of the DSM (White et al., 2009a). Children and adolescents diagnosed with ASD appear more likely to develop anxiety symptoms or an anxiety disorder when compared with other clinical populations (Bellini, 2004; Chalfant et al., 2007) as well as typically developing children



(Bellini, 2004; Gillott et al., 2001; Green, Gilchrist, Burton, & Cox, 2000; Kim et al., 2000; Reaven et al., 2009). Kanner (1943) was one of the first researchers to describe problems related to anxiety in this population, yet research efforts for treatment of these problems has only recently begun (White et al., 2009a). Currently reported prevalence rates are variable, ranging from 11% to 84% (Chalfant et al., 2007; Lang et al., 2010; Reaven et al., 2009; Sze & Wood, 2007; White et al., 2009a). Larger-scale studies have produced more consistent prevalence rates between 40% and 45% (Bellini, 2004; Simonoff et al., 2008).<sup>1</sup>

Measurements of the most common subtypes of anxiety in pediatric populations indicate that individuals with ASD exhibit higher lifetime prevalence of anxiety than the general population (American Psychiatric Association, 2000). In one of the primary studies using a diagnostic instrument specifically designed to differentiate symptoms of psychiatric disorders from ASD, Leyfer and colleagues (2006) found specific phobias to be the most common anxiety disorder among participating youth (44.3%). Multiple phobias were reported by sample participants with ASD; however, many of the fears reported were dissimilar to that of typically developing children (e.g., loud noises, crowds). The presence of obsessive-compulsive disorder (OCD) was the second most prevalent anxiety disorder (37.2%), followed by separation anxiety (11.9%), social phobia (7.5%), and generalized anxiety (2.4%). Prevalence rates reported in other studies were not always consistent with these subtype findings, yet many studies revealed

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<sup>1</sup> More information related to this topic can be found in a review by Kerns and Kendall (2012), wherein the researchers review whether anxiety symptoms are better understood as part of an ASD diagnosis or as a separate, comorbid disorder. This information is important when attempting to determine prevalence rates.

increased anxiety problems for individuals with ASD when compared with other populations (Bellini, 2004; White et al., 2009a). Situations commonly reported as anxiety-provoking included completing routines or having others act in a particular manner, non-social aspects of interactions (e.g. extraneous noise), transitions, and changes in familiar settings (Leyfer et al., 2006). Interestingly, anxiety symptoms did not appear to vary over time.

Debate exists about whether or not individuals with ASD are, in fact, demonstrating symptoms of a separate anxiety disorder or if symptom presentation is caused by overlap between disabilities (Kerns & Kendall, 2012; Wood & Gadow, 2010). In addition, some clinicians view anxiety as an expected feature of ASD, because it is frequently observed with this population (Leyfer et al., 2006). Limitations in diagnosing mental health conditions behaviorally and clinically (i.e., via observations, interviews, and rating scale reports), rather than through medical procedures and practices (e.g., blood tests), render answers to these questions elusive (Lilienfeld, Waldman, & Israel, 1994).

Despite this lack of clarity in diagnosis and prevalence rates, individuals with ASD appear especially vulnerable, when compared with other populations, to develop problems with anxiety. As mentioned previously, initial research by Kanner (1943) suggested that many behavioral symptoms of autism such as insistence on sameness and the presence of particular routines and fixations were precipitated and maintained by anxiety (e.g., fear of change in the environment). Thus, these core features of autism cause children with this disability to be increasingly susceptible to problems with anxiety.

Following the publication of Kanner's work, several other theories have been presented as a framework for attempting to understand deficits in social interaction skills, communication, and behaviors exhibited in individuals with ASD that may contribute to increased risk for developing problems with anxiety. The theory of mind hypothesis ([ToM], Baron-Cohen, Leslie, & Frith, 1985) and the weak central coherence theory (Happe, 1996) were among the most commonly cited theories. An analysis of thinking patterns and impairments in neuropsychological functioning, including the executive function theory of ASD, (Landa & Goldberg, 2005; Ozonoff & Jensen, 1999) and heightened physiological arousal common to these disorders, is also critical to understanding of this complex disorder and in assisting with the development of effective interventions. However, research remains unclear concerning the reasons why this particular group of children is increasingly susceptible for developing problems with anxiety (Bellini, 2004; Gillott et al., 2001; Green et al., 2000; Kim et al., 2000).

### **Theoretical Foundations for Understanding Autism Spectrum Disorder & Increased Vulnerability for Developing Anxiety Disorders**

The theory of mind hypothesis (ToM) suggests that children with ASD tend to have deficits in their ability to understand mental states such as imagining and predicting others' thoughts and feelings (Baron-Cohen et al., 1985) and in turn, realizing that these thoughts and feelings may be different from their own (Burnette et al., 2005). Meta-cognitive as well as social cognition skills needed to think about one's own and others' thoughts are often deficient in children and adolescents with ASD (Hobson, 1989; Rutter, 1983). In addition, how these thoughts and feelings are related to observable behaviors is difficult to differentiate and understand for children with these disorders. Cardaciotta and

Herbert (2004) as well as Anderson and Morris (2006) found that many of these same social skill impairments are observed in individuals diagnosed with social anxiety disorders.

These observed deficits may have a significant impact on a child's ability to form and participate in social relationships (e.g., being bullied, not fitting in with others) with appropriate social and emotional reciprocity (Burnette et al., 2005; Tantam, 2000). The individual may develop thought distortions similar to children with anxiety disorders, believing that the world is unpredictable and poses a threat to one's safety (Lang, 1968), which may result in significant social rejection or isolation and/or the development of paranoid thought patterns (Anderson & Morris, 2006). It is hypothesized that the accumulation of multiple years of such isolation, rejection, and/or failure to form appropriate social relationships with others puts children with ASD at an increased risk for developing anxiety and/or depression (Attwood, 1998; Tantum, 2000; Vasey & Daleiden, 1994).

Current research and debate has shown that the theory of mind hypothesis may not be as central to understanding ASD as once espoused (Kleinmans, Akshoomoff, & Delis, 2005), with more recent emphasis being placed on underlying cognitive processing deficits such as those described within the weak central coherence theory. This theory indicates that children with ASD tend to demonstrate weaknesses when attempting to process information as whole concepts (Happé, 1996). A preference for processing information at the detail level has been observed with this population. Therefore, children with ASD tend to have difficulties generalizing whole concepts and skills across multiple settings. These deficits may be observed in social interactions when children

with ASD and/or anxiety disorders attempt to process facial expressions, pragmatic language, or behavioral performance of another individual (Burnette et al., 2005; Cardaciotta & Herbert, 2004).

Similar to the theory of mind hypothesis, some studies have highlighted the idea that not all children with an ASD evidenced better processing at the detail level (Burnette et al., 2005), leading to some debate regarding the validity of the weak central coherence theory. Burnette and colleagues (2005) highlight the idea that the weak central coherence theory has almost exclusively been studied in individuals with ASD, and given the high prevalence of comorbidity of mood and anxiety disorders with this population, this pattern of processing may have been more closely related to cognitive processing patterns observed in anxious or depressed individuals than being specific to individuals with ASD. More research on both the theory of mind hypothesis and on weak central coherence theory is warranted. However, newer neuroimaging techniques, such as results from functional magnetic resonance imaging (fMRI) have begun to reveal deficits in several areas of the brain and neural circuitry, which may be linked to behavioral observations consistent with these two theories (Wehrenberg & Prinz, 2007).

The executive function theory explains that many children with ASD tend to have deficits in executive function skills (Landa & Goldberg, 2005; Ozonoff & Jensen, 1999). Executive functions include multiple cognitive processes that direct or cue the brain to perform a specific task (McCloskey, Perkins, & VanDivner, 2009). These skills are required for appropriate emotional and behavioral regulation, planning, organization, cognitive flexibility, and inhibition skills (Gioa, Isquith, Guy, & Kenworthy, 2000). Cognitive switching and initiation of verbal retrieval strategies also appear impaired in

children with ASD, with higher-functioning children exhibiting increased levels of rigidity or inflexibility (Kleinhans et al., 2005).

Research by Winner (2008) indicated that the coordination of many of these skills is needed for successful social interactions; this includes demonstration of skills such as inhibition of inappropriate emotional and behavioral responses as well as shifting between thoughts, ideas, and topics (e.g., flexibility in thinking). In addition, deficits in executive functions have been correlated with communication problems in individuals with ASD (Landa & Goldberg, 2005; McEvoy, Rogers, & Pennington, 1993). Problems with emotional regulation and physiological arousal are often observed in this population, which tends to increase vulnerability to developing anxiety disorders (Biederman, Rosenbaum, Chaloff, & Kagan, 1995; Gray, 1990; Schultz, Romanski, & Tsatsanis, 2000). Adequate regulation requires a fluent ability to shift and sustain attention appropriately and inhibit and control emotions and behaviors (Eisenberg et al., 1997). Therefore, impairments in any of these skills may significantly impact communication and social relationships. Despite much research supporting the executive function theory in understanding deficits observed in individuals with ASD, some inconsistencies have surfaced, requiring further research in this area (Hill, 2004; Pennington & Ozonoff, 1996).

### **The Anxious Brain**

Several brain structures, neural circuits, and neurotransmitter activities have been uncovered as key components in our understanding of the anxious individual's cognitions, feelings, and behaviors. The anatomical structures outlined in this section have been shown both to increase as well as to alleviate levels of anxiety, depending

upon how adequately the information is being communicated and filtered between various subcortical and cortical structures of the brain (Kana, Keller, Minshew, & Just, 2007). Neuropsychological research discussed in this section has been successfully linked to effective treatments for anxiety disorders, especially in the area of cognitive-behavioral therapy (CBT).

Important to our discussion and understanding of anxiety disorders is the role and function of the amygdala, basal ganglia as well as other subcortical structures of the brain (LeDoux, 1996; LeDoux, 1998). Subcortical regions of the brain are responsible for automatic reactions and responses to stimuli, and in the case of anxiety disorders, these reactions are often in response to stimuli that are perceived as threatening (as described in Barlow, 2000 & Chorpita, 2001). How stimulus information is processed and interpreted, however, is the role of cortical structures such as the orbitofrontal cortex, anterior cingulate gyrus, and prefrontal cortex. Individuals with anxiety disorders often interpret the majority of stimuli, especially neutral types of information, as threatening or negative (Barlow, 2000; Friedberg & McClure, 2002). Finally, how information is communicated between subcortical and cortical structures will also play a substantial role in adaptive versus maladaptive responses to stimuli (Kana et al., 2007; Koziol & Budding, 2009).

The amygdala and its circuitry play a central role in detecting changes in one's environment as well as in triggering needed systems to respond to those changes or stimuli present in the setting (Davis, 1992; Fanselow, 1994). If the stimuli are perceived as threatening, the amygdala will communicate with structures of the limbic system such as the thalamus, hippocampus, and hypothalamus that an immediate response to the change in the environment is required. The amygdala will also communicate with the

peripheral and autonomic nervous systems. The autonomic nervous system, composed of the sympathetic and parasympathetic nervous systems, are responsible for initiating arousal of the brain under threatening conditions as well as inhibiting arousal, respectively.

Increased amounts of adrenaline will be produced and correspond with behavioral reactions such as the body's "fight or flight" mechanisms (Cannon, 1929). These reflexive reactions cannot be controlled consciously unless information is mediated appropriately to the cortical structures of the brain. The basal ganglia, which is composed of multiple dopamine receptors, is central to the communication of information between subcortical and cortical regions of the brain. Information from the cortex is communicated with the basal ganglia via the nucleus accumbens and thalamus and circulated back to the cortex and structures within the limbic system (Wehrenberg & Prinz, 2007). Increased levels of neuronal firing activity within the basal ganglia are often associated with elevated levels of tension and anxiety, unless the gamma-aminobutyric acid (GABA) receptors are functioning appropriately by inhibiting the level of basal ganglia and brain activity.

Failure to inhibit increased neuronal firing in the basal ganglia can be observed in several externalizing behaviors associated with anxiety disorders (Wehrenberg & Prinz, 2007). Feifer (2009) noted that emotional and cognitive negativity, defined as catastrophizing in cognitive-behavioral therapy literature (Freeman, Pretzer, Fleming, & Simon, 2004), is commonly associated with this type of brain activity. Irritability and aggression, quick startle responses, and the presence of panic attacks have also been observed and associated with elevated levels of basal ganglia activity (Wehrenberg &



Prinz, 2007).

Exhibitions of conscious cognitive control, such as assigning emotional valence to stimuli, are the roles and functions of the cortical systems in the brain (Feifer, 2009). Central to these processes are the orbitofrontal cortex and anterior cingulate gyrus, structures that are part of the prefrontal cortex which have connections with the amygdala and other structures within the limbic system (Koziol & Budding, 2009). The orbitofrontal cortex assists with encoding of environmental stimuli by associating the information with previous experiences stored in memory. Impairments in the orbitofrontal cortex, whether it be under- or over-activity, has been linked to problems of cognitive and behavioral inhibition (e.g., obsessive thoughts, controlling impulses, poor social judgment; Lehmkuhl, Storch, Bodfish, & Geffken, 2008; Wehrenberg & Prinz, 2007).

Mediation between emotion and cognition in order to produce an adaptive behavioral response to stimuli that is filtered from subcortical structures is relegated to the anterior cingulate gyrus (Wehrenberg & Prinz, 2007). Additionally, the anterior cingulate gyrus assists with problem solving when a particular thought or behavior is maladaptive by producing multiple options or ways in which to view the problem. When functioning properly, the individual is able to mediate information and create multiple solutions with “ease and flexibility,” (Wehrenberg & Prinz, p. 22), which is often seen as an area of impairment in children with anxiety and/or autism spectrum disorders (Kleinhans et al., 2005). In children with these disorders, the mediation process of the anterior cingulate gyrus is not as fluid, but instead may appear that the child is “stuck” in a particularly narrow or rigid pattern of thinking (Wehrenberg & Prinz, 2007).

Furthermore, negative thought patterns tend to “loop” repeatedly between subcortical and cortical structures of the brain instead of shifting to free up cognitive space in order to be able to create potential adaptive solutions (Koziol & Budding, 2009). When this occurs, it is much more difficult for the prefrontal cortex to communicate effective solutions and therefore decrease arousal in the limbic system. Impairments in these prefrontal cortex regions in individuals with anxiety disorder have been supported by several neuroimaging studies (Wehrenberg & Prinz, 2007).

Over- and under-activity in the various brain structures described here have been implicated in different types of anxiety disorders and have subsequently led to different types of intervention and treatment (Feifer, 2009). Anxiety disorders have been described as spectrum disorders, characterized by varying cognitive and behavioral presentations. Bottom-up anxiety disorders, such as post-traumatic stress disorder (PTSD), panic attacks, and phobias consist of an overactive amygdala (subcortical structure) paired with an underactive prefrontal cortex (cortical structure). Exposure therapies have been highly effective in treating these types of anxiety disorders.

Top-down types of anxiety disorders are typically characterized by an overactive prefrontal cortex, which can be observed in an individual’s excessive worrying and fearfulness. This pattern of functioning is common among individuals diagnosed with generalized anxiety disorder (GAD) and obsessive-compulsive disorder (OCD). Cognitive-behavior therapy techniques, which focus on cognitive restructuring, are often effective strategies for treatment (Friedberg & McClure, 2002).

### **Cognitive-Behavioral Therapy (CBT) as an Effective Treatment**

Although more research is needed to understand the causes leading to increased rates of anxiety in children with ASD, it is clear that this population presents with problematic symptoms requiring treatment and intervention (Sze & Wood, 2007; White et al., 2009a). ASD is a complex and multifaceted disorder and when further complicated by comorbidity such as anxiety problems, symptoms are often more severe and cause a greater impact in the individual's level of functionality (Kessler, Chiu, Demler, & Walters, 2005).

Prevention efforts for this population of children have proven challenging; Kim and researchers (2000) report that results are currently inconclusive concerning which symptoms present in earlier developmental stages of autism are correlated with later anxiety symptomology. Therefore, the need for effective interventions for treatment of anxiety disorders in children with ASD has become increasingly imperative. Additionally, clinicians are continually faced with the challenge of meeting the treatment needs of this growing population. Despite the lack of a cure for autism, effective treatments for anxiety are well established and may present as potential solutions for relieving anxiety in individuals with ASD.

The use of Cognitive-Behavioral Therapy (CBT) in the treatment of children with ASD and comorbid anxiety disorders is a relatively new area of research (Anderson & Morris, 2006; Donoghue, Stallard, & Kucia, 2011; Reaven & Hepburn, 2003; White et al., 2009a), yet current results appear promising. However, numerous studies purport the use of CBT as a highly effective treatment of anxiety disorders (Barlow, 2000; Bolton, McPoyle-Callahan, & Christner, 2012; Khanna & Kendall, 2008). Many of the techniques utilized in treating anxiety disorders in non-autistic populations appear

effective for treating anxiety in children with ASD (Bolton et al., 2012), yet several modifications such as the use of visual and concrete information, as well as decreasing language demands were essential components outlined across studies (Anderson & Morris, 2006; Chalfant et al., 2007; Reaven et al., 2009; Sofronoff et al., 2005; Sze & Wood, 2007). More research in this area is needed in order to treat this increasingly growing group of children and adolescents more effectively. At present, the existing research appears promising for the use of CBT as a possible intervention for treating anxiety symptoms associated with this complex disorder (Cardaciotto & Herbert, 2004; Chalfant et al., 2007; Reaven & Hepburn, 2003; Reaven et al., 2009; Sofronoff & Attwood, 2003; Sze & Wood, 2007; White et al., 2009a/b; Wood et al., 2009), yet it is still unclear which elements of the therapy are effective (Anderson & Morris, 2006).

Several manual- and modular-based treatments have begun to be researched as viable treatments for anxiety in this population. One such manual-based program that has shown effectiveness is the *Cool Kids* program (Lyneham, Abbott, Wignall, & Rapee, 2003). The modules covered in the *Cool Kids* program include feelings recognition (particularly in regard to anxious feelings and physiological responses to anxiety), cognitive restructuring, and exposure activities. However, in order to treat anxiety symptoms effectively in children with ASD, several modifications to the program were implemented in the research by Chalfant and colleagues (2007).

Modifications included the use of visual and concrete materials such as worksheets and other visual supports. Additionally, most of the treatment was based on relaxation and exposure interventions, because the researchers indicated that these interventions were more concrete in nature and relied less on communication skills,

which frequently is an area of impairment for this population (APA, 2000). Cognitive restructuring components were also utilized; however, because of documented language impairments, worksheets outlining “helpful” versus “unhelpful” thoughts were supplied to participants in the study. Coping self-talk, relapse prevention, and parent involvement were also implemented. Results from this study indicated that individuals in the treatment condition showed significant decreases in anxiety symptoms, when compared with the control condition.

The Multi-Component Integrated Treatment (MCIT) intervention (formerly called the Multimodal Anxiety and Social Skills Intervention) has also shown some effectiveness in treating anxiety symptoms with this population of children and adolescents (Bolton et al., 2012). Several modules have been shown to be effective in this intervention, including the following: parent involvement, social-learning/exposure assignments, psycho-education, and feedback on performance. Research by White and colleagues (2009b) has begun to document the effectiveness of this manual-based treatment in reducing anxiety symptoms in children with ASD.

Reaven and colleagues (2009) also measured the effectiveness of CBT in treating children with high-functioning autism spectrum disorders. A group therapy, manual-based approach was utilized in this study. Participants were involved in a 12-week intervention program. The researchers created and implemented an original manual for this study instead of modifying an existing manual to meet the needs of this specific group. Visual and concrete strategies for teaching CBT techniques were emphasized through the use of multiple-choice worksheets, drawing and photography, and video modeling. Parent participation in both group and dyad sessions was also a part of the

study. The first six sessions focused on identification of feelings and physical signs of anxiety. The children were taught progressive muscle relaxation, deep breathing, and the use of positive coping statements. The latter portion of the study included exposure-based techniques. In an effort to generalize these skills across multiple settings, children in the study created videos that showed them facing their fears. At the completion of the study, the children's parents reported significant decreases in anxiety symptoms on the SCARED measure. This study also showed support for the effectiveness in using group therapy in treating anxiety symptoms in children with ASD (Reaven et al., 2009).

Because of the complexity of ASD and related disorders, modular-based treatments have also shown effectiveness in meeting the needs of children with autism and comorbid anxiety symptoms or disorders (Bolton et al., 2012). As an example, Sofronoff and colleagues (2005) conducted a study using CBT in treatment of this population. Sessions were similar to those in the manual-based treatments described previously, which included the following modules: feelings and physiological recognition, relaxation, social skills training, and the use of Social Stories (Gray, 1998). Parental involvement and training sessions were also been found to be effective in working with this clinical population. Results of this study indicated reductions in anxiety symptomatology, as reported by the children's caregivers.

### **Computer-Based and Computer-Assisted CBT Treatments**

The use of computer-based (no interaction with a therapist) and computer-assisted CBT treatments (some interaction with a therapist) is being utilized increasingly as alternatives methods to the traditional delivery of mental health services (Cunningham, 2008; Khanna & Kendall, 2008). Some studies have focused on the level of effectiveness

in treating adult populations (as cited in Cunningham, 2008), but the use of technology has become increasingly intriguing in meeting the mental health needs of children and adolescents (Goodwin, 2008; McCrone et al., 2004; Proudfoot et al., 2004). Several advantages for this type of intervention include increased accessibility to mental health services, lower costs to families and healthcare insurance providers (approximately 1/3 less of the cost of traditional mental health therapy), and a clearly delineated timeframe for treatment (Cunningham, 2008; Khanna & Kendall, 2008). Treatments are also standardized, delivered relatively consistently across participants, and the individual has the option of “attending” sessions at his or her convenience (Khanna & Kendall, 2010) and in a setting of his or her choosing. Issues related to confidentiality and uneasiness with face-to-face therapy may become potential barriers in youth who are seeking needed mental health support, which computer-based treatments minimize or eliminate. Given the current state of continually rising healthcare costs (CDC, 2011) and the increasing demand for mental health support with children and youth (Bolton et al., 2012), computer-based therapies offer a potential solution in meeting the many needs of this population.

One of the first computer-based programs, CAVE, was used effectively in the treatment of spider phobias (Dewis et al., 2001). Positive outcomes in the treatment of arachnophobia occurred after only three, 45-minute computer sessions; this is in comparison with a wait-list condition. The majority of computer-based treatments were originally designed for adults, yet the implementation of CAVE and the positive results that followed, ignited an interest in creating more programs for a younger generation. There were attempts to implement earlier computer-based treatments intended for adults

for use with younger audiences, in hopes of being easily transferrable and producing similar outcomes. However, newer programs such as Cool Teens, created exclusively for adolescents who have increased anxiety, have led to recent interest and research efforts in this area.

Implementation of computer-based programs has shown to be more effective than typical bibliotherapy in educating children and adolescents about their medical or mental health conditions (as cited in Cunningham, 2008). Results from a study with children diagnosed with leukemia showed that those children using technology felt more control over their illness, when compared with children who had read a book about their conditions (Dragone, Bush, Jones, Bearison, & Kamani, 2002). Similar findings were also observed in a study that included children diagnosed with cystic fibrosis and implementation of the STARBRIGHT CD-ROM program (Davis, Quittner, Stack, & Yang, 2004).

Several disadvantages to computer-based methods of therapy have also been demonstrated. For instance, designing an age-appropriate, computer-based treatment program was described as extremely labor intensive, and by the time the product becomes available it may no longer be consistent with current best practice literature (Khanna & Kendall, 2010). In addition, when using a computer the therapist does not have the opportunity to build a therapeutic relationship with the client, which is often essential to effective outcomes in therapy (Khanna & Kendall, 2008). This also limits the therapist in his or her ability to make needed changes to therapy when a particular technique becomes ineffective, symptoms worsen, or the client is in crisis, to name a few scenarios. Nonetheless, current research and outcomes from computer-based therapies are favorable



and continue to show promise as an effective intervention and treatment option for children and adolescents experiencing a variety of mental health problems (Cunningham, 2008). In addition, Khanna and Kendall (2008) discuss the fact that the use of computer-based programs has assisted with bringing research and clinical findings into real-world settings.

### **Using Technology with Children with Autism Spectrum Disorder**

Many studies have articulated the benefits of using technology with children with ASD for increasing social skills, communication, and a variety of academic skills (Goldsmith & LeBlanc, 2004; Goodwin, 2008). Additionally, studies have revealed that children with this disability are often motivated to complete tasks that include technology and are able to perform and evidence skills that often go unnoticed without such devices. Technological support and learning devices are available in a variety of formats including tactile and auditory prompting devices, video modeling and feedback, and computerized instruction, to name a few (Goldsmith & LeBlanc, 2004).

Use of computer-based instruction has become increasingly more available to families, clinics, and schools to teach skills that are often impaired with this population (Goodwin, 2008). Although results from various studies measuring the effectiveness of using technology with children with ASD remain inconsistent, the majority of studies using computer-based instruction are positive and promising (Cunningham, 2008). Therefore, the delivery of computer-based or computer-assisted CBT for this population may serve as a viable and effective treatment option for decreasing secondary anxiety symptomology. More research is needed in this area because most computer-based studies targeted children with anxiety disorders without the complication of an ASD.

**Purpose of the Study**

The purpose of the current study is to examine the effectiveness of a computer-assisted, CBT intervention in treating children with ASD and co-occurring anxiety symptoms. Participants engaged in a 12-week, CBT program called Camp Cope-A-Lot (CCAL), which was specifically developed to treat anxiety disorders in children aged 7 to 13 years (Kendall & Khanna, 2008). Modules used as part of the CCAL intervention included the following: psychoeducation related to anxiety, relaxation techniques, cognitive restructuring, exposure, and role-playing (Khanna & Kendall, 2008). Practice tasks were provided at the end of each session. Two parent sessions were also implemented as part of this intervention.

There is a substantial amount of research to support the use of CBT when treating anxiety disorders in children and adolescents (Barrett et al., 1996; Kendall, 1994; Kendall et al., 1997; Khanna & Kendall, 2008; Silverman et al., 1999). Much less information is known regarding the use of computer-assisted, CBT programs with this population, yet the available research on the CCAL intervention appears promising, specifically in terms of reducing anxiety symptoms (Khanna & Kendall, 2010). For example, Khanna and Kendall (2010) conducted a randomized clinical trial, showing that 81% of participants no longer met criteria for their primary anxiety diagnosis following completion of the CCAL intervention. In addition, effects of the intervention were maintained during a 3-month follow-up investigation. Preliminary findings regarding the feasibility, efficacy, and acceptability of this treatment format for youth also appeared encouraging (Kendall, Khanna, Edson, Cummings, & Harris, 2011; Khanna & Kendall, 2008; Spence, Holmes, March, & Lipp, 2006). Despite these findings, even less research has been published on

the effectiveness of the CCAL program in treating anxiety in children with ASD.

The current study utilized a multiple, single case design with outcomes measured at pre- and post-treatment phases (Kazdin, 2003). Data were collected via behavior rating scales and direct cognitive measures targeting executive function skills, including sustained attention, response inhibition, attentional control, and cognitive switching. It was proposed that results from this study would add to the literature on this topic and potentially provide evidence for use of the CCAL intervention as an effective treatment option for this growing population of children. More specifically, it was hypothesized that implementation of the CCAL intervention would decrease observable and self-reported anxiety symptoms in children with ASD. As discussed in the literature, it might also be expected to observe an overall decrease in symptomology of ASD by treating accompanying or associated symptoms (e.g., anxiety symptoms). Lastly, it was proposed that participants in the study would demonstrate improvements in several executive function skills, as targeted by the cognitive components of CCAL intervention.

### **Chapter 3: Method**

#### **Participants**

Participants were recruited on a voluntary basis from the Washington D.C. metropolitan area, which included residents from Virginia, Maryland, and the District of Columbia. However, upon completion of the recruitment phase, each of the participants that showed interest in the study and met inclusionary criteria resided in Prince George's County, Maryland. Participants in this research study were youth aged 11 to 15 years, who had been diagnosed with ASD. This included children who were previously diagnosed with a DSM-IV-TR disability of Autistic Disorder, Asperger's Syndrome, and Pervasive Developmental Disorder, Not Otherwise Specified (PDD-NOS). Current written documentation (less than three years old) confirming one of these diagnoses was required. Assessment reports from trained professionals, such as clinical or school psychologists, pediatricians, or other mental health professionals were accepted as proof of disability. Each of the participants, with the exception of one child, was initially diagnosed with ASD between the ages of 2 and 3 years of age; the final participant was diagnosed with Asperger's Syndrome at 11 years of age. However, each participant had been receiving special education, counseling, or other mental health supports from early childhood, with implementation of services ranging from 7 to greater than 10 years.

Each child reportedly resided in single-family homes in suburban neighborhoods, which were close in distance to the study site (range = 10-30 miles round trip). In addition, participants' parents were married and had received education beyond a high school diploma, with trade/technical training as well as Master's, Professional, and Doctoral degrees listed as the highest levels of schooling completed. Each parent was

employed and total household incomes were reported by three of the four participants' families, ranging from \$60,000 to above \$100,000 per year.

Five participants were recruited, yet one participant was lost to attrition prior to the completion of this study. The final sample consisted of one female and three male, African-American children, who were rising seventh and ninth grade students (two from each grade-level). The study began during the summer months and continued into the fall of the 2014-2015 school year. One child started the study as an 11-year-old and had a birthday before completing the study. The remaining participants' ages in years were consistent across data collection phases. Participants' names have been changed and are referred to in this study as "Sally," "Sam," "John," and "Matthew."

Sally was an 11-year-old, female diagnosed with Asperger's Syndrome with secondary diagnoses of Attention Deficit-Hyperactivity Disorder (ADHD) and Social Anxiety Disorder (FSIQ, SS = 93; VIQ, SS = 85). As a result of her Social Anxiety Disorder diagnosis, Sally primarily demonstrated anxiety related to taking tests, performing poorly in school, potentially embarrassing herself in front of others, and worrying about what others thought of her. Sally also reported that she had difficulties making friends, because she tended to have interests different from her same-aged peers. Generalized anxiety, worry, and fearful feelings were frequently observed. When faced with a problem, Sally's parents shared that their daughter often complained of stomachaches. Exposure tasks included taking tests, facing her fear of heights (through visualization and practice riding elevators), and sharing her thoughts and feelings with her parents, especially when reprimanded for her behaviors. Sally conquered her fear of believing she acted foolishly in front of others by auditioning for a school play. She also

used visualization and watched movies to face her fear of snakes. Sally had a birthday over the course of her participation in this study. Therefore, her post-intervention data were compared with normative information of 12-year-old children.

Sam was a 14-year-old, male diagnosed with ASD. Sam's overall cognitive skills fell within the low average range (FSIQ,  $SS = 86$ ), which were commensurate with results from standardized testing measuring his verbal skills (VIQ,  $SS = 85$ ). Anxiety related to fears of the dark, of doctors and of dentists, and of insects and spiders was reported to be of a significant degree. Moreover, Sam frequently worried about what others thought of him and often needed to recheck that things were completed in a particular manner. Sam's parents shared that their son was often scared when he had to take tests and was worried about performing poorly on his schoolwork. Exposure tasks included taking tests, being a good sport when losing a game, and conquering his fear of storms and the dark. Sam also faced his fears of being left home alone and thoughts of his loved ones dying. He practiced assertiveness skills in intervention sessions for use when teased by his peers at school.

John was a 12-year-old, male diagnosed with ASD and accompanying intellectual impairment (FSIQ,  $SS = 50$ ). Despite exhibiting significantly low performance on standardized assessments of verbal ability (VIQ,  $SS = 40$ ), John was able to communicate at a functional level needed to participate in the CCAL intervention. Pre-intervention data suggested that John demonstrated worry and anxiety in many situations, which included being away from his parents, performing poorly on his schoolwork, and embarrassing himself in front of others. John could become extremely uncomfortable when asked to talk in front of others, specifically with less familiar individuals. In these

situations, John would often resort to shaking his head “yes/no” or responding with one-word utterances. Several obsessive-compulsive behaviors were also observed to a significant degree (e.g., rechecking things, repetition of tasks and activities). Some of John’s exposure tasks included taking tests, ordering food independently in restaurants, allowing others to move objects from a preferred spot or position, and having conversations with less familiar individuals at school.

The final participant, Matthew, was a 15-year-old, male diagnosed with ASD and co-occurring intellectual impairment (FSIQ, SS = 53). Similar to John, Matthew’s standardized test scores in the area of verbal functioning fell within the low range (VIQ, SS = 43), yet he was able to communicate in a manner appropriate for the CCAL intervention. Matthew’s parents shared the information that their son was often afraid of being in crowded places such as stores. He also worried about being away from his parents or being alone in his house or other familiar settings. Fears of the dark, putting his face in or under water, and animals, especially dogs, were reported to a significant degree. Socially, Matthew seemed anxious when taking tests, using public restrooms, and interacting or speaking with same-aged peers or adults. Exposure tasks included taking tests, playing and having conversations with same-aged peers, and ordering food independently in restaurants. Additionally, Matthew learned to tolerate crowded spaces and hearing the sound of babies crying.

### **Inclusion Criteria**

Individuals were eligible for inclusion in the study if they were children between the ages of 11 years, 0 months to 15 years, 11 months and had been diagnosed with ASD. As mentioned previously, written documentation, no more than 3-years-old, showing the

presence of ASD or a previous DSM-IV-TR Pervasive Developmental Disorder from a qualified professional was required. Participants were not taking medication to treat problems with anxiety, nor were they suffering from significant seizures or any other medical conditions that would interfere with their participation in the study.

Furthermore, participants had to be experiencing elevated levels of anxiety (Total Score  $\geq$  30 for males or  $\geq$  32 for females), as evidenced by parent report on the Spence Children's Anxiety Scale (SCAS).

Proficiency in English was needed in order to access materials included in the intervention program. A laptop computer with the CCAL program installed was made available at the research site for participation in the study. According to the Maryland Technology Literacy Standards for Students, the skills required for basic computer use were also needed to access information from the CCAL intervention program (Maryland State Department of Education [MSDE], 2013). These skills were measured by means of a Basic Computer Skills Checklist, which can be found in Appendix A. Participants were required to demonstrate at least 80% accuracy in order to be included in the study.

Participants needed to be available to complete weekly lessons on the computer over the course of a 12-week time period. Independent sessions required approximately 30 minutes of the child's time on the computer, with 10 extra minutes allowed for Game Time, which served as positive reinforcement for the child's participation.

Approximately 10 minutes per week were also allotted for parent contact with the researcher. Additionally, parents received direct support from the researcher during parent sessions conducted during the third and seventh sessions. Transportation to and



from the research study site was required on a weekly basis for each of the 12 weeks of intervention.

### **Recruitment**

Participants were recruited on a voluntary basis by means of informational flyers distributed at the One World Center for Autism, Inc. (see Appendix B), which is a non-profit organization (tax-exempt 501c3) dedicated to nurturing the social, psychological, educational, and physical well-being of children and their families living with Autism in Prince George's County, Maryland. The organization's mission is to link those living with Autism to their world through family support, informational resources, community awareness, and individual therapeutic and medical care. Flyers were posted in several locations at the Center, as well as being placed with other informational materials in the Parent Resource Library. Information on the flyer included the purpose of the study, name of the institution and study site, names of the principal and responsible investigators, contact information, basic eligibility criteria for participants, and length of study. Participants also were recruited by means of employee referral, through the permission of the family. Families concerned with their child's level of anxiety received a paper flyer regarding the research study from an employee at the Center. Upon contact with the researcher, interested families were provided with additional information about the study and given an opportunity to ask any questions. Interested families were then invited to the study site to conduct screening procedures. Recruitment, data collection, and intervention sessions were conducted at the One World Center for Autism, Inc.

## Measures and Materials

**Intake Procedure Protocol.** The researcher created the Intake Procedure Protocol, shown in Appendix C, in order to standardize initial intake procedures across participants. The protocol contained ordered steps that the researcher took to ensure fidelity. In addition, discontinuation rules were provided on the protocol and adhered to as appropriate (e.g., inclusionary criteria not met).

**Inclusionary Criteria Checklist.** The Inclusionary Criteria Checklist also provided a standardized protocol for use by the researcher to determine if interested participants met criteria for the present study (see Appendix D). Potential participants needed to meet 11 different criteria in order to be considered for the study. Some of the criteria that were measured included: age, native language, availability and transportation, proof of diagnosis, and the presence of elevated anxiety symptoms.

**Basic Computer Skills Checklist.** The Basic Computer Skills Checklist outlined necessary skills needed by participants in order to access the CCAL computer program. Potential participants needed to demonstrate at least 80% accuracy to be considered for inclusion in the present study.

**Contact Information Form.** Parent and participants' names, addresses, and phone numbers were collected via the Contact Information Form (see Appendix E). This information was collected to assist with scheduling or in case of emergency situations. Contact information was kept in a secure location, separated from de-identified, intervention data.

**Parental Demographic Information Form.** Participants' parents were asked to respond voluntarily to a variety of demographic questions on the Parental Demographic

Information Form. Information was collected regarding race/ethnicity of the child, parental education, household income, and years of intervention the participant had received, among other relevancies. The reader is referred to Appendix F for more detailed information.

**Camp Cope-A-Lot (CCAL) & Go-To-Gadget (GTG).** Camp Cope-A-Lot (CCAL) is a 12-week, computer-assisted intervention program for children aged 7 to 13 years (Kendall & Khanna, 2008). Although some of the participants were above the designated age range for the CCAL program, research suggested that children with ASD tend to demonstrate delays in social functioning several years below that of their chronological age (APA, 1994). Therefore, the CCAL intervention appeared appropriately selected for the intended population. Participants completed this program with the assistance of the researcher, who served as the “coach.” According to the authors of CCAL, the program utilizes empirically supported, cognitive-behavioral strategies in treating anxiety symptoms and disorders in youth such as generalized anxiety disorder (GAD), social phobia, and separation anxiety (Kendall & Khanna, 2008). Behavioral strategies included exposure and relaxation techniques, role-playing, and positive reinforcement for practice; skills such as psycho-education, problem solving, and restructuring of anxious thoughts were some of the cognitive processing strategies implemented. Kendall and Khanna (2008) describe that the goal of the program is “...to teach children to recognize signs of unwanted anxious arousal and to let these signs serve as cues for the use of anxiety management strategies, with the help of an interactive computer program” (p. 3).

The first six sessions or levels of CCAL included skill-building activities, in which the child was introduced to the program and learned basic concepts and skills through interactive activities, with assistance from camp characters. The child completed these sessions relatively independently with minimal interaction from the researcher/coach. Review activities, called Cope-A-Lot Contests, were provided between sessions to help reinforce and practice presented information. Participants prepared for contests by writing responses in a provided notebook, referred to as the Go-to-Gadget (GTG). Sessions three and seven were parent sessions during which the coach and parent met to discuss the child's progress, any concerns, and upcoming sessions in the treatment program.

The last six sessions included exposure tasks in which the child, with assistance from the coach, practiced learned skills in imaginary and/or real-life situations. The child constructed a four-step plan, the FEAR Plan, which provided coping strategies that the participant could use when experiencing anxiety both inside and outside of intervention sessions. The FEAR plan was an acronym that included the following four steps: F = *Feeling Frightened* (identifying physiological symptoms of anxiety), E = *Expecting Bad Things to Happen* (identifying anxious thoughts or thought distortions), A = *Attitudes and Actions that Can Help* (cognitive reframing and identification of helpful thoughts and behaviors), and R = *Results and Rewards* (reflecting on outcomes and providing positive support for efforts). Keeping with the camping theme, participants practiced tasks called Totem Pole Challenges. Challenges were arranged in a hierarchical order and slowly practiced from least (low-anxiety) to most difficult situations for the individual (moderate to high anxiety). The coach assisted the child with planning both in- and out-of-session

practice tasks, processed the experiences with the child, and provided positive reinforcement for the child's efforts. The child's FEAR plan was reiterated and utilized during exposure-based, practice tasks to teach the child that he or she could cope in anxiety-provoking situations. Data were collected before and after exposure tasks by means of a Fear Thermometer rating.

Participants were rewarded at the end of each session for their efforts and participation with a 10-minute time period to play videogames, found under the Game Time section of CCAL. More games were added and accessible to participants as they continued through each level of the program. Additional time for playing games could also be determined by the coach in an effort to reward participants for engaging in more challenging exposure tasks. If the participant did not view playing videogames as a rewarding activity, the coach devised a separate arrangement with the participant and caregiver.

**Session Objectives & Procedures Protocol.** In order to standardize procedures across participants and across intervention sessions, beyond what was provided in the CCAL computer program, the researcher created a treatment protocol that can be found in Appendix G. Progress notes from each intervention session were recorded on the protocol forms. This information was kept in a secure location and all identifying information was removed from each participant's file.

**Spence Children's Anxiety Scale (SCAS).** The Spence Children's Anxiety Scale (SCAS) contains parent reports and self-reports, used to measure anxiety symptoms related to separation anxiety, social phobia, obsessive-compulsive disorder (OCD), panic-agoraphobia, generalized anxiety, and fear of physical injury (Spence, 1997). It is one of

the first scales designed to measure these anxiety symptoms specifically in children, versus other available anxiety scales that were converted from adult measures (Spence, 1998). In addition, the SCAS was one of the original scales to compare anxiety symptoms with general and clinical samples of children; several existing anxiety measures provide scores solely in comparison with anxiety-disordered or other clinical groups of children. The SCAS was initially designed for children aged 8 to 12 years; however, ongoing research efforts have led to new versions of the SCAS, which enable the scale to be administered to children as young as 3-years-old and up to age 18 years.

The versions of the SCAS that were used in this study contained 44 items, yet only 38 of these items relate to specific symptoms of anxiety. The remaining six items are included in order to decrease negative response bias (<http://www.scaswebsite.com>). Children and parents were asked to rate the frequency with which they experienced or observed their child experiencing the listed anxiety symptoms, respectively. Symptoms were measured using a 4-point, Likert scale that included the descriptors “Never,” “Sometimes,” “Often,” and “Always.” The SCAS should not be used in isolation to diagnose anxiety disorders but instead in conjunction with other assessment measures and with multiply confirming data. The SCAS has been used in clinical, therapeutic, and research contexts for assessment/screening, monitoring treatment progress, as well as measuring intervention outcomes. For this study, the SCAS was administered prior to implementation of the CCAL intervention and at the conclusion of the study in order to measure participants’ and parents’ perceptions of anxiety symptoms.

The normative sample for the SCAS, which was composed of 4,916 Australian children, included 2,386 males and 2,530 females (<http://www.scaswebsite.com>). When

compared with national census data, the sample was found to be representative of the demographics of individuals living in the area. However, the SCAS has also been used effectively in many countries and continues to be translated into other languages and re-normed with other populations.

In general, research on the SCAS has yielded acceptable psychometric properties, which supports its clinical utility (Spence, 1997; Spence, 1998; Spence, Barrett, & Turner, 2003). Internal reliability for the Total Scale was considered high (Cronbach  $\alpha = .93$ ), which indicated that the items on the SCAS were measuring a consistent construct of anxiety (<http://www.scaswebsite.com>). Subscale scores were also determined to be adequate, with internal consistencies ranging from .74 to .82. Increased variability on the Physical Injury Fears subscale resulted in a lower consistency coefficient of .60. This pattern of internal reliability was observed across age and gender groups (e.g., boys 8-11 & 12-15, girls 8-11 & 12-15), with the exception of the Separation Anxiety subscale which revealed weaker reliability for the younger group of males (Cronbach  $\alpha = .69$ ) and the older sample of females (Cronbach  $\alpha = .68$ ). Test-retest reliability was assessed within a 6-month interval, yielding a total score reliability coefficient of .60 with more variability observed on individual subscales (Spence, 1998). Convergent validity was measured in Spence (1998) by comparing SCAS scores to the Revised Children's Manifest Anxiety Scale (RCMAS, Reynolds & Richmond, 1978). Total score comparisons from the SCAS and RCMAS were adequate, as determined by a Pearson product-moment correlation of .71.

**Stress Survey Schedule for Individuals with Autism and Other Pervasive Developmental Disabilities (SSS).** Individuals with ASD and co-occurring anxiety

symptoms tend to have some anxiety-provoking stimuli that differ from that of individuals primarily struggling with anxiety disorders (Grodén et al., 2001). Because of this, the Stress Survey Schedule for Individuals with Autism and Other Pervasive Developmental Disabilities (SSS) was selected to measure those triggers specific to individuals with ASD. Eight separate dimensions of stress are measured on the SSS including the following: Anticipation/Uncertainty, Changes and Threats, Unpleasant Events, Pleasant Events, Sensory/Personal Contact, Food Related Activity, Social/Environmental Interactions, and Ritual Related Stress (Goodwin, Groden, Velicer, & Diller, 2007).

The technical adequacy of the SSS continues to be researched and studied, because it is one of the first scales to attempt to measure stress with this population. At present, the SSS appears effective for measuring perceived stress in some subgroups of individuals with autism or other developmental disabilities (Goodwin et al., 2007). Internal consistency for the scale was acceptable, yet no other measures of reliability were reported. No normative information or standardized scoring was available at the time of this writing.

Information from the SSS was collected from participants at the beginning of the study in order to target interventions, specifically exposure and practice tasks, as part of the CCAL treatment. The SSS was also re-administered at the conclusion of the study in order to measure intervention outcomes. Administration of this scale was conducted using an interview format by the researcher. Each participant's parent was also present at the time of the interview. The Life Stressors portion of the SSS (seven total items) was not administered to participants.



**Autism Spectrum Rating Scales (ASRS™).** The Autism Spectrum Rating Scales (ASRS™) is an assessment instrument used to quantify parents' and teachers' perceptions of an individual's observable symptoms, behaviors, and associated features consistent with that of an Autism Spectrum Disorder (Goldstein & Naglieri, 2009). The ASRS can be used for individuals between the ages of 2 and 18 years old. Several versions of the ASRS are available; however, for this study, the full-length, parent form for children aged 6 to 18 years was administered. This version of the ASRS contains 71 items in which the parent rated how frequently a behavior was observed using the following descriptors: "Never," "Rarely," "Occasionally," "Frequently," or "Very Frequently." The ASRS yields a Total Score, a DSM-IV-TR score,<sup>2</sup> as well as scores on several ASRS Scales – Social/Communication, Unusual Behaviors, and Self-Regulation – and Treatment Scales – Peer Socialization, Adult Socialization, Social/Emotional Reciprocity, Atypical Language, Stereotypy, Behavioral Rigidity, Sensory Sensitivity, and Attention. When used in conjunction with other assessment data, the ASRS is able to provide accurate information regarding diagnostic decision-making, intervention planning, and progress monitoring. Of greater importance to the current study, the ASRS can be used to effectively evaluate treatment outcomes for children on the Autism Spectrum.

The ASRS is the first norm-referenced, assessment tool to be standardized nationally in regard to identifying, classifying, and measuring symptoms and behaviors

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<sup>2</sup> The ASRS was normed using the DSM-IV-TR, which was the most current version available at the time the scale was created. However, the ASRS had been updated to reflect changes described in the DSM-5. Scores for this study were compared to updated, DSM-5 normative data.

related to ASD (Goldstein & Naglieri, 2009). The standardization sample consisted of 2,560 cases from across the United States, which included 1,920 cases for the version of the ASRS form (6-18 Years) used in this study (960 parent & 960 teacher forms). Data from 1,200 clinical cases (7.6% of the normative sample) were also analyzed and included children diagnosed with the following disabilities: Autistic Disorder, Asperger's Syndrome, PDD-NOS, Attention-Deficit/Hyperactivity Disorder (ADHD), Mood and Anxiety Disorders, Developmental Delays, and Communication Disorders. The percentages of children diagnosed with these clinical conditions were matched in an effort to reflect the percentages found in the U.S. general population. Furthermore, normative samples were evenly distributed by age and gender and highly representative of 2000 U.S. Census data in terms of race and ethnicity.

Psychometric properties related to reliability and validity of the ASRS were considered adequate (Goldstein & Naglieri, 2009). High levels of internal consistency and test-retest reliability were reported. Internal consistency coefficients (reported using Cronbach's Alpha) for the Total ASRS Score (6-18 Years) were reported at .97 across parent and teacher reports, and reliability coefficients for the DSM-IV-TR Scales (6-18 Years) ranged from .95 to .96. In addition, internal consistency on the ASRS Scales (6-18 Years) across raters ranged from .92 to .95 and reliability amongst the Treatment Scales (6-18 Years) was also considered high and ranged from .73 to .92. Test-retest reliability was calculated within a two- to four-week timeframe, with Total ASRS Scores (6-18 Years) ranging from .87 to .92 across teacher and parent ratings, respectively (reported using Pearson's  $r$ ,  $p < .001$ ). DSM-IV-TR Scale (6-18 Years) scores were high

(.88 to .91) as were test-retest coefficients for the ASRS Scales (6-18 Years; .84 to .91) and Treatment Scales (6-18 Years; .80 to .91).

Tests of discriminative validity were also well established and yielded acceptable technical evidence (American Educational Research Association [AERA], 1999). In general, the ASRS scales were able to discriminate individuals with ASD, accurately, from the general population and from other clinical groups at an average rate of 92.1% (Goldstein & Naglieri, 2009). Individuals with ASD were also rated significantly higher than the other two comparison groups across each scale, with the exception of the Attention scale on the ASRS (6-18 Years) teacher form.

Convergent validity was tested by having parents and teachers complete the ASRS forms, in addition to at least one of the following measures: Gilliam Autism Rating Scale, Second Edition (GARS-2<sup>TM</sup>), Gilliam Asperger's Disorder Scale (GADS<sup>TM</sup>), and/or Childhood Autism Rating Scale (CARS<sup>TM</sup>). Differences in metrics (e.g., raw scores, differences in mean scores) and comparison groups (e.g., only using clinical groups) utilized in these previously-mentioned measures were described as possible factors influencing overall correlations with the ASRS (product overview citation). Nonetheless, correlations between the ASRS (6-18 Years) parent forms revealed moderate (.50) to large relationships (.80) with these other measures of Autism Spectrum Disorders ( $p < .01$ ).

The ASRS (6-18 Years) requires approximately a sixth grade reading level and about 15 minutes to administer. This version of the ASRS was administered prior to the start of the CCAL intervention and again upon completion of the intervention in order to monitor treatment progress. It should be noted that the present researcher met examiner

qualifications, because the ASRS was intended to be utilized by mental health professionals, including certified school psychologists. Three different score reports can be generated with the ASRS, including an Interpretive, Comparative, and Progress Monitoring Report. Only the Progress Monitoring Reports were used for this study; these provided information regarding each participant's progress or change in scores over time. The ASRS was scored using the ASRS scoring software by entering each parent's responses from paper-and-pencil administrations. The researcher completed this process twice in order to verify that information was accurately entered into the software program.

**Test of Everyday Attention for Children (TEA-Ch).** The Test of Everyday Attention for Children (TEA-Ch) is a standardized assessment designed to measure several attention and executive function skills in youth aged 6 to 16 years (Manly, Robertson, Anderson, & Nimmo-Smith, 1999). The TEA-Ch contains two parallel forms (Versions A & B) that are conducive to measuring pre- and post-treatment outcomes. Several tasks measuring sustained attention, response inhibition, attentional control, and switching were selected, because it was hypothesized that cognitive-behavioral interventions would increase skills in these areas, which are typically weaker or impaired in individuals with ASD. Subtests selected to measure outcomes in these skill areas included Walk, Don't Walk, Creature Counting, and Opposite Worlds. The majority of the subtests on the TEA-Ch were designed by the authors to minimize demands on language comprehension, memory, as well as general knowledge skills (Manly, Anderson, Nimmo-Smith, Turner, Watson, & Robertson, 2001). Thus, despite each participant's level of intellectual functioning, the selected subtests included simple and

clear directions and each child was able to participate adequately in this portion of the study.

The TEA-Ch was normed on a sample of 293 Australian children, which included a total of 147 females and 146 males. Individuals in the sample were stratified into six age groups with 58 children aged 11 to 12 years; 58 children aged 13 to 14 years, and 29 children aged 15 to 16 years. Children were not included in the norming process if they experienced a head injury, neurological illness, developmental delay, sensory loss, or had been diagnosed with a disability (Manly et al., 1999). In addition, children with attention or learning problems were excluded from the standardization sample. Each of the children selected as part of the normative sample was administered Version A of the TEA-Ch, and 55 of the 293 children also completed Version B. The second administration of Version B was conducted between 6 to 15 days after completing Version A. This information was used to measure test-retest reliability as well as to determine cut scores needed to establish a significant change in performance between test administrations. Correlation coefficients for the three selected subtests, when controlled for age, were considered adequate and reported as follows: Creature Counting accuracy = .71, Walk, Don't Walk = .71, Same World time = .87, and Opposite World time = .85. The authors indicate, however, that results should be interpreted cautiously when administrations of the TEA-Ch exceed the timeframe used when developing normative comparison information.

One hundred and sixty children from the normative sample were also administered several subtests from the WISC-III. Results suggested that the TEA-Ch was an adequate assessment instrument for measuring the outlined attention and

executive function skills for children with average levels of intelligence, because there was little relationship between their WISC-III performances (Manly et al., 1999).

Minimal information is known about the TEA-Ch in regard to measuring these same skills in children with below average cognitive abilities.

Validity of the TEA-Ch was assessed using Structural Equation Modeling, which revealed that selective and sustained attention as well as attentional control "...alone form a good fit of the patterns of performance observed in a large group of children" (Manly et al., 1999, p. 35). Convergent validity was also measured with 96 children from the normative sample using the Stroop task (Trenerry, Crosson, DeBoe & Leber, 1989), Trails Test (Spren & Strauss, 1991), and the Matching Figures Test (Arizmendi, Paulsen, & Domino, 1981). In general, moderate to strong correlations were found when subtests from the TEA-Ch were compared with tests that measured similar aspects of attention.

**Posttest Procedure Protocol.** A Posttest Procedure Protocol was created in order to standardize post-intervention procedures across participants. The protocol contained ordered steps that the researcher took to ensure fidelity. The reader is referred to Appendix H for more detailed information.

**Informal Research Feedback Form.** The Informal Research Feedback Form was used to collect information regarding parents' and participants' experiences during the intervention-based study, as well as to inform future research (see Appendix I). Six questions required parents to respond using a 5-point, Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The remaining items contained several open-ended questions.

### **Research Design**

This study utilized a single case study design with multiple participants (Kazdin, 2003). Data from four cases were collected and analyzed as part of this study. This research design was selected in an effort to measure treatment outcomes in a small sample of participants with ASD, which by definition, is a disability that can vary widely in severity between and among diagnosed individuals. This research was considered a preliminary study used to measure the effectiveness of the CCAL program in treating anxiety symptoms in children with ASD. Data were analyzed between pre- and post-treatment phases for each participant.

**Dependent and Independent Variables.** Dependent variables for this study included symptoms of anxiety and stress, severity of Autism Spectrum Disorder symptomatology, and constructs of executive functions. Elevated symptoms of anxiety were defined on the parent's SCAS report as Total Scores that were greater than or equal to 30 or 32 for male and female participants, respectively. This information was also used as inclusionary criteria for participation in the study. *T*-scores on the SCAS: Child Version were scaled with a mean of 50 and standard deviation of 10, with *T*-scores at or above 60 being suggestive of elevated levels of anxiety. Subscale and Total Scores were analyzed at pre- and post-treatment phases.

Data regarding specific stimuli that could be considered particularly stressful or anxiety provoking for individuals with ASD were also collected using the Stress Survey Schedule for Individuals with Autism and Other Pervasive Developmental Disabilities (SSS). This information was collected both at pre- and at post-intervention phases via self-report (with parents present) in order to analyze individual changes on several stress-

related subscales. Moreover, data from the pre-intervention phase were used to develop the child's fear hierarchy for the Totem Pole Challenges, which were part of the last six, practice-based treatment sessions.

Despite consistent deficits in the areas of communication, social interaction, and behavior, individuals with ASD may vary greatly in the severity of these as well as other associated symptoms. Thus, severity of symptomatology was measured at the pre-treatment phase using the Autism Spectrum Rating Scales (ASRS<sup>TM</sup>) in order to understand and analyze further symptoms specific to participants in the study. The scale was re-administered at the post-treatment phase to help determine if the intervention was effective in decreasing the severity of associated symptoms of ASD (e.g., resistance to change) and/or increasing more adaptive behaviors such as improved peer relationships and self-regulation skills.

Last, pre- and post-treatment data were collected using three subtests from the TEA-Ch – Walk, Don't Walk, Creature Counting, and Opposite Worlds. These subtests were selected in order to measure changes in the areas of sustained attention, response inhibition, attentional control, and switching. Thus, it was hypothesized that cognitive-behavioral interventions would increase skills in these areas, which are typically weaker or impaired in individuals with ASD and/or anxiety disorders.

### **Procedure**

Following the recruitment process, parents and potential participants were invited to the One World Center for Autism, Inc. at a time and day that was convenient for the family. Parents were asked to bring to their scheduled appointments, written documentation of their child's date of birth, diagnosis of ASD, and relevant test results.



All procedures, including Informed Consent procedures, were conducted in a private room to ensure confidentiality.

The Informed Consent process was fully explained (as outlined on the Informed Consent Form for Participation) to the participant's legal caregivers. Parents were given ample time to read and ask questions regarding the Informed Consent Form for Participation. Additionally, parents were allowed to take home an unsigned form for up to three days before consenting or declining involvement in the study. If the parent agreed to have his and her child participate in the study, the researcher served as a witness and signed the consent form as well. If the parent decided to decline participation, procedures were discontinued. Potential participants were provided with more detailed information about the study via the Informed Assent Form for Participation. The same procedures were followed when obtaining assent for participation.

If consent and assent for participation were provided, initial inclusionary criteria were reviewed with the family (Appendix D). If a criterion was not met, or if the parent answered "No," to a significant question, intake procedures were discontinued immediately in order to avoid unnecessary use of the participants' time and any discomfort in disclosing more confidential information. At such a point, the parent and participant were thanked for their time and intake procedures were discontinued.

If the participant initially qualified for the study, the child's parent was asked to complete the Spence Children's Anxiety Scale (SCAS: Parent Version). The potential child participant also completed several skills on a provided computer in order to measure his or her level of proficiency, as outlined on the Basic Computer Skills

Checklist. Next, using the remaining items on the Inclusionary Criteria Checklist, the researcher determined full eligibility for participation. The researcher provided information to the parent and to the potential participant regarding whether or not full criteria for inclusion in the study were met. If the participant did not qualify, the parent and participant were thanked for their time and procedures were discontinued. Procedures were continued only for participants that met full eligibility criteria. Eligible participants were assigned an identification number and all personal information was removed from their data sheets and forms.

Following these procedures, demographic information was collected via the Parental Demographic Information Form as well as pre-intervention data, which included administration of the SSS, the SCAS: Child Version, the ASRS (Parent 6-18 Years), and the Creature Counting, Opposite Worlds, and Walk, Don't Walk subtests from Version A of the TEA-Ch. A date and time to begin the intervention was determined with the parent, with the intervention beginning within one week of completing intake and pre-intervention procedures. Participants attended the study site for one intervention session per week. This included approximately 50-60 minutes per week during the first six sessions and approximately 65 minutes per week during the remaining six sessions. As mentioned previously, the treatment protocol that was used for each participant is included in Appendix G. Following the twelfth week of intervention, posttest data were collected, which included administration of the following: SCAS: Parent and Child Versions, SSS, ASRS (Parent 6-18 Years), and Version B of the Creature Counting, Walk, Don't Walk, and Opposite Worlds subtests from the TEA-Ch. The Informal

Research Feedback Form was also provided to parents to learn more about their experiences with the CCAL intervention.

## Chapter 4: Results

### Overview

Data are presented in this chapter in an effort to answer each of the study's research questions and supporting hypotheses. Results are arranged by research question. Additionally, each participant's data are reviewed and analyzed in response to the research questions and hypotheses.

*Research Question 1:* Does implementation of the CCAL intervention reduce overall symptoms of anxiety in children with ASD?

*Hypothesis 1a:* Participants will demonstrate a reduction in observable anxiety symptoms between pre- and post-test, as measured on the parent's report from the Spence Children's Anxiety Scale (SCAS).

Each child's parent was asked to report on observable anxiety symptoms using the Spence Children's Anxiety Scale (SCAS): Parent Version. Each parent rated the frequency with which behaviors were observed using a 4-point Likert scale – “Never,” “Sometimes,” “Often,” or “Always” (Spence, 1994). The SCAS: Parent Version yields six subscale scores as well as an overall Total Anxiety Score. Items measured symptoms on the following subscales: 1] Panic Attack and Agoraphobia, 2] Separation Anxiety, 3] Physical Injury Fears, 4] Social Phobia, 5] Obsessive Compulsive, 6] Generalized Anxiety Disorder. Raw scores were collected and compared with means and standard deviations published by Nauta and colleagues (2004). Two different samples of children

– anxiety disordered and non-clinical groups of children – were used for comparison and data analysis during pre- and post-intervention phases. In addition, raw scores were compared with normative information according to the participant’s sex and age group (e.g., boys aged 12-18 years).

Data from the SCAS: Parent Version scales were collected prior to and following the completion of the 12-week, CCAL intervention. It should be noted that Sally had a birthday between pre- and post-intervention data collection stages. Because of this, her responses were compared with girls aged 8-11 years and girls aged 12-15 years, respectively. Participants’ subscale scores are presented in Figures 4.1 to 4.4. In addition, Total SCAS Anxiety Scores across participants at pre- and post-intervention phases are depicted in Table 1.

Table 1

*Participants’ Total SCAS Anxiety Raw Scores at Pre- and Post-Intervention Phases*

	<i>Pre-Test</i>	<i>Post-Test</i>
Sally	32	14
Sam	30	23
John	41	21
Matthew	30	37

**Sally’s SCAS: Parent Version Results**

Prior to starting the intervention, Sally’s parents reported elevated levels of anxiety on the Total SCAS Anxiety Score similar to that of children diagnosed with

anxiety disorders. Moreover, concerns were noted on several of the subscales including the Social Phobia, Obsessive Compulsive, and Generalized Anxiety Disorder scales. Items of significance included anxiety related to taking tests and performing poorly in school, potentially embarrassing herself in front of others, and worrying about what others might think of her. Sally was observed to demonstrate fear when attempting to talk in front of her class and showed difficulties inhibiting negative or silly thoughts from entering her mind. Her parents noted that Sally could become bothered by these types of thoughts as well. Generalized anxiety, worry, and fearful feelings were also reported to a significant degree, when compared with a non-clinical sample of children. When faced with a problem, Sally's parents shared the information that their daughter often complained of stomachaches.

Some concerns, as denoted by ratings between the means from the non-clinical and anxiety disordered comparison groups, were observed on the Separation Anxiety scale. Per parent report, Sally was often observed worrying about being away from her parents and feared that something negative may happen to someone in her family. Minimal concerns were reported on items from the Panic Attack and Agoraphobia and Physical Injury Fears scales.

Following completion of the CCAL intervention, results from each of the subscales, with the exception of the Physical Injury Fears scale, showed decreased behavioral concerns. Scores were also more similar to the non-clinical sample of same-aged girls. Furthermore, Sally's Total SCAS Anxiety Score decreased between pre- and post-intervention stages. Conversely, increased concerns regarding fears of insects,

spiders, and the dark, as measured on the Physical Injury Fears subscale, were endorsed at the post-intervention stage.

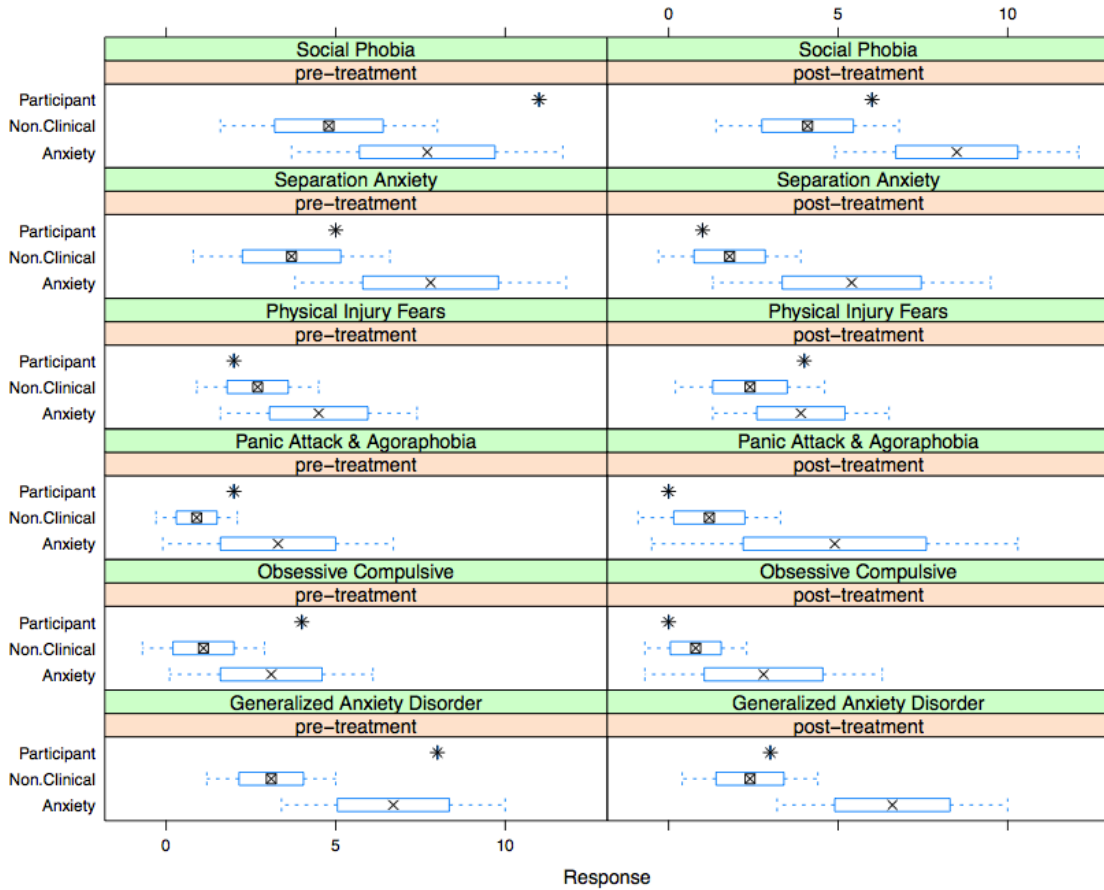


Figure 4.1. Sally's Pre- & Post-Intervention SCAS: Parent Version Results in Comparison with Means and Standard Deviations of Non-Clinical and Anxiety Disordered Samples of Children. The asterisks depict the participant's scores for each subscale.

**Sam's SCAS: Parent Version Results**

Pre-intervention data for Sam were remarkable for elevated scores similar to the anxiety-disordered normative sample of children on the Physical Injury Fears, Social

Phobia, Obsessive Compulsive, and Generalized Anxiety Disorder subscales. Per parent report, Sam's Total SCAS Anxiety Score was also elevated when compared with boys of the same age. An item analysis revealed frequent fears of the dark, doctors and dentists, and insects and spiders. Sam's parents shared that their son was often scared when he had to take a test and worried about performing poorly on his schoolwork. Sam was frequently observed worrying about many things, especially what others thought of him. Scores on the remaining scales – Panic Attack and Agoraphobia and Separation Anxiety scales – were similar to ratings obtained by the non-clinical sample of children.

A review of post-intervention data was suggestive of decreased behavioral symptoms on the Obsessive Compulsive, Generalized Anxiety Disorder, and Total SCAS Anxiety scales. Results from the Panic Attack and Agoraphobia and Separation Anxiety scales remained relatively low and were similar to non-clinical samples of children; however, results from the Physical Injury Fears and Social Phobia scales continued to be elevated at a level similar to that of children with anxiety disorders. Items/behaviors of significance similar to those mentioned previously continued to be endorsed, at relatively consistent rates, during the post-intervention phase.



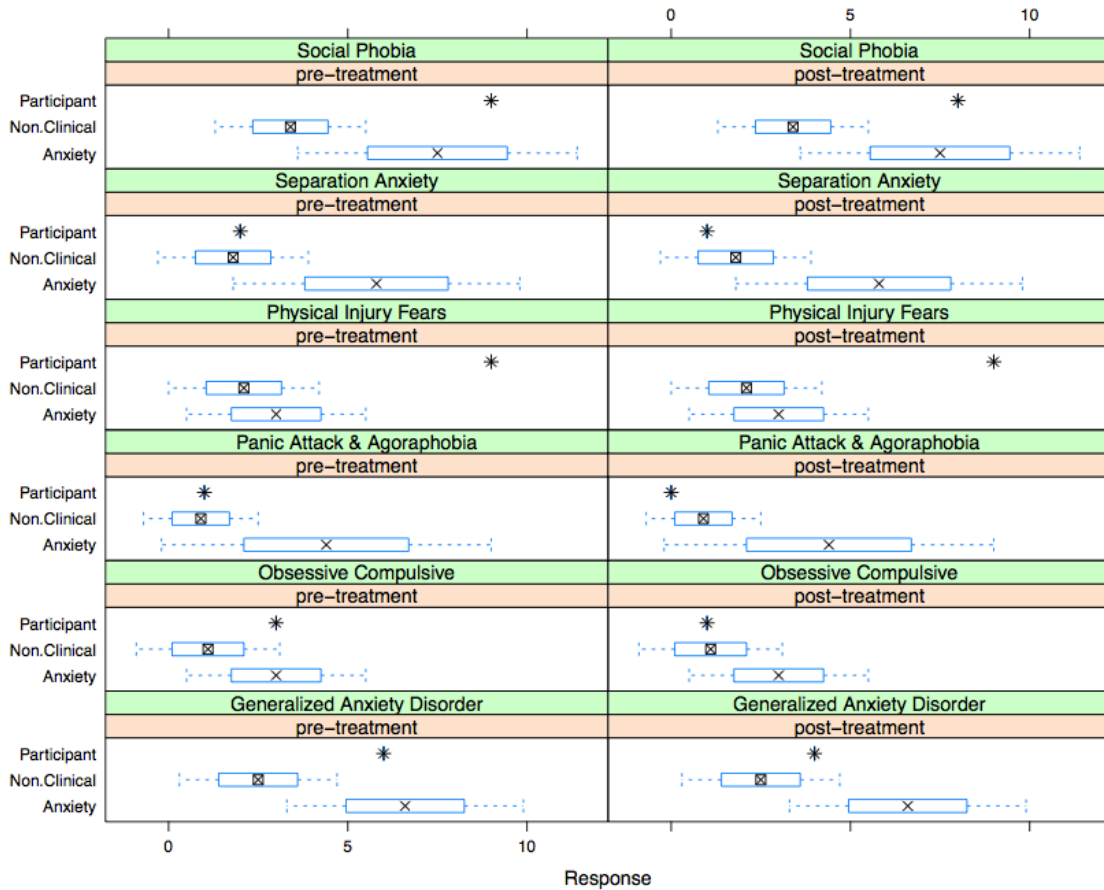


Figure 4.2. Sam’s Pre- & Post-Intervention SCAS: Parent Version Results in Comparison to Means and Standard Deviations of Non-Clinical and Anxiety Disordered Samples of Children. The asterisks depict the participant’s scores for each subscale.

**John’s SCAS: Parent Version Results**

At the beginning of this study, John’s parents reported elevated levels of Total Anxiety, similar to that of boys diagnosed with anxiety disorders. Additionally, elevation within the anxiety-disordered range was observed on each of the SCAS subscales, with the exception of the Panic Attack and Agoraphobia scale. Per parent report, John often demonstrated increased worry and anxiety regarding many situations. He appeared

frequently afraid of being away from his parents and of being home alone, because he often worried that negative things could happen to him. Furthermore, John reportedly worried about performing poorly on his schoolwork, embarrassing himself in front of others, and he frequently worried about what other people thought of him. It was reported that John became very uncomfortable and anxious when he was asked to talk in front of or with others, especially when speaking with less familiar individuals. John was observed refraining from talking, shaking his head “yes/no,” or responding quietly with one-word utterances in these situations. Several obsessive-compulsive behaviors were also observed, in which John often rechecked that he had completed things correctly; he also performed tasks and activities repeatedly. John’s mother shared the information that her son could become very anxious about losing preferred objects or toys; thus, he often placed these objects in a particular area in his room and frequently rechecked that these items had not been moved throughout the day. Last, John was noted to show an extreme dislike of insects and spiders.

Following his participation in the CCAL intervention, John’s mother reported a decrease in many of the previously mentioned, problematic behaviors as denoted by lower scores on the Separation Anxiety, Social Phobia, Obsessive Compulsive, and Generalized Anxiety Disorder scales. John’s Total SCAS Anxiety Score was also lower during the post-intervention phase. Results from the Separation Anxiety and Generalized Anxiety Disorder scales were more similar to that of the non-clinical sample of children, and ratings from the Obsessive Compulsive scale and John’s Total SCAS Anxiety Score fell between the mean scores for both comparison groups. Although John’s Social Phobia score decreased from pre- to post-intervention phases, the results remained more

similar to children in the anxiety-disordered, normative group. Post-intervention data from the Panic Attack and Agoraphobia and Physical Injury Fears scales were consistent with pre-intervention results, with scores within the average and elevated ranges, respectively. An item analysis revealed that John seemed to become more fearful of the dark at the end of the study, and he also continued to demonstrate a similar level of fear of insects and spiders and of speaking in front of his classmates. Per parent report, John appeared slightly less worried about performing poorly at school and about what others thought of him, yet these behaviors continued to occur on a fairly frequent basis. The behaviors outlined on the remaining items from the SCAS: Parent Version were either not observed at all or not observed to a significant degree (e.g., ratings of “Sometimes” observed).

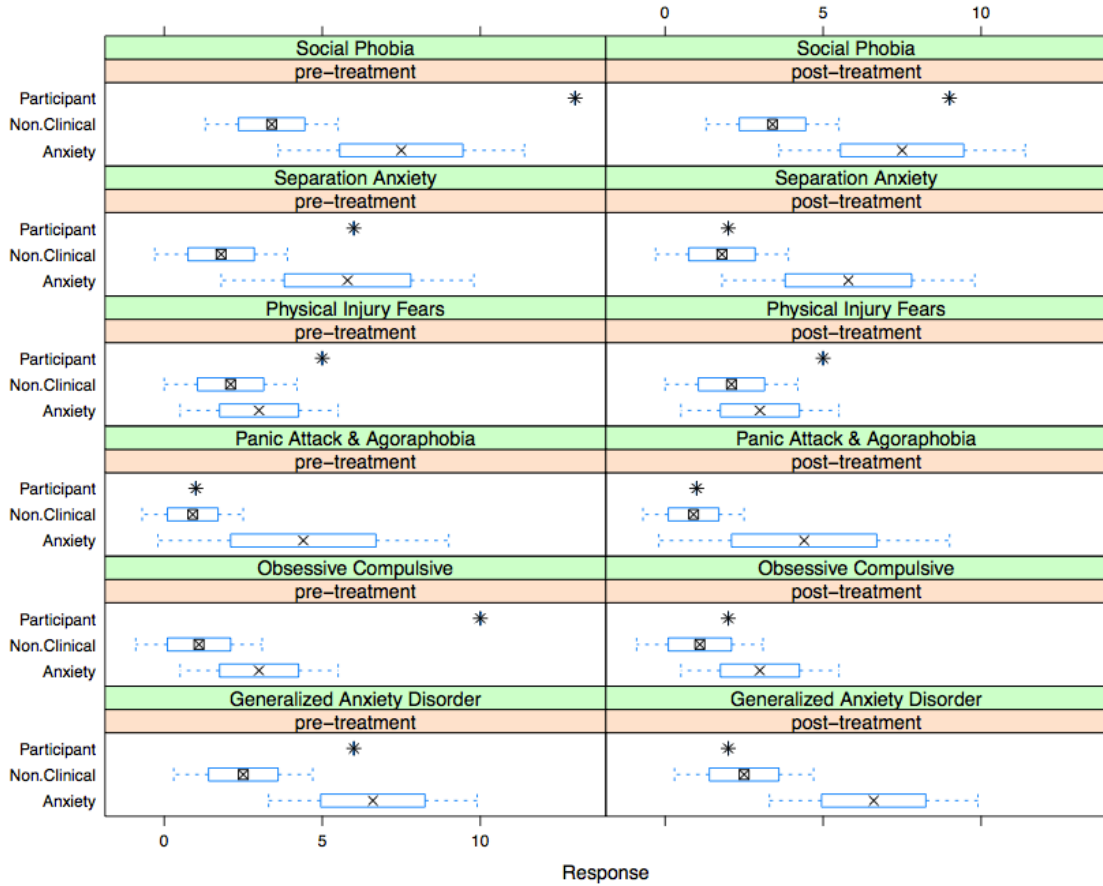


Figure 4.3. John’s Pre- & Post-Intervention SCAS: Parent Version Results in Comparison with Means and Standard Deviations of Non-Clinical and Anxiety Disordered Samples of Children. The asterisks depict the participant’s scores for each subscale.

**Matthew’s SCAS: Parent Version Results**

Pre-intervention data for Matthew revealed elevation on the Panic Attack and Agoraphobia, Separation Anxiety, Physical Injury Fears, and Social Phobia scales. Scores on these scales were considered more similar to that of children in the anxiety-disordered, normative sample. In addition, Mathew’s Total SCAS Anxiety Score was

considered elevated for his chronological age. Matthew's parents shared the information that their son was often afraid of being in crowded places such as stores. He also worried about being away from his parents and alone in his house or other familiar setting. Fears of the dark, of putting his face in or under water, and of animals, especially dogs, were reported to a significant degree. Of the items measured on the Social Phobia subscale, Matthew reportedly seemed scared when taking a test, using a public restroom, and interacting or speaking with same-aged peers or with adults. Matthew's parents reported minimal behavioral concerns on the Obsessive Compulsive scale, and behaviors described on the Generalized Anxiety Disorder scale yielded a score between the mean scores of the two comparison groups.

Upon completion of the CCAL intervention, ratings from the Panic Attack and Agoraphobia, Separation Anxiety, Physical Injury Fears, and Social Phobia scales showed increases in anxiety symptoms from the pre-intervention phase. In turn, Matthew's Total SCAS Anxiety Score also increased during post-intervention data collection. Many of the same behaviors as those mentioned previously continued to be endorsed to the same degree following participation in the CCAL intervention. Ratings from the Obsessive Compulsive scale remained the same, but results from the Generalized Anxiety Disorder scale decreased. Both of these scales yielded results more similar to the mean score of the non-clinical, normative sample.

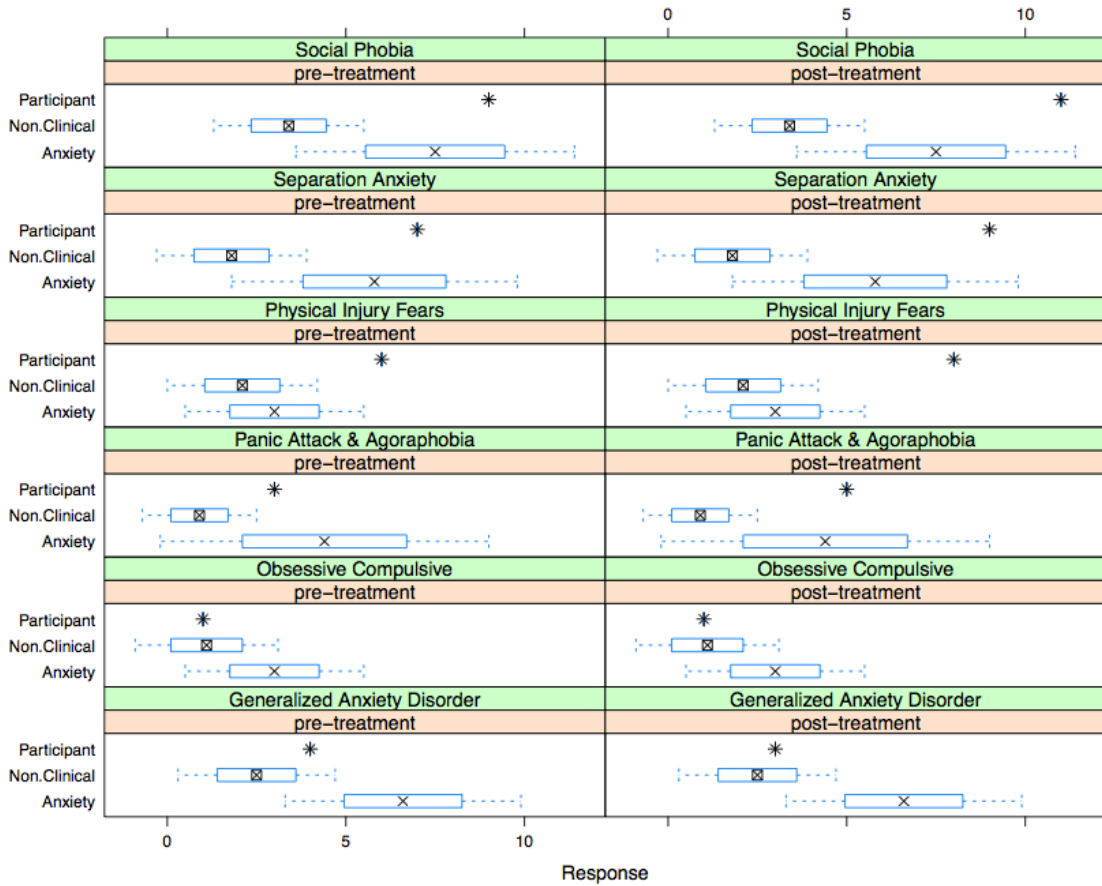


Figure 4.4. Matthew’s Pre- & Post-Intervention SCAS: Parent Version Results in Comparison with Means and Standard Deviations of Non-Clinical and Anxiety Disordered Samples of Children. The asterisks depict the participant’s scores for each subscale.

*Hypothesis 1b:* Participants will demonstrate a reduction in anxiety symptoms between pre- and post-test, as measured on the child’s report from the Spence Children’s Anxiety Scale (SCAS).

Each child participant was also asked to report on individual anxiety symptoms, using the Spence Children’s Anxiety Scale (SCAS): Child Version. Participants rated the

frequency with which certain events occurred, using a 4-point Likert scale – “Never,” “Sometimes,” “Often,” or “Always” (Spence, 1994). The SCAS: Child Version yields six subscale scores as well as an overall Total Anxiety Score. Subscales included items related to the following: 1] Panic Attack and Agoraphobia, 2] Separation Anxiety, 3] Physical Injury Fears, 4] Social Phobia, 5] Obsessive Compulsive, 6] Generalized Anxiety Disorder. Raw scores were converted to *T*-scores, using normative information based on the participant’s sex and age group (e.g., boys aged 12-15 years). *T*-scores on the SCAS: Child Version were scaled with mean of 50 and standard deviation of 10, with *T*-scores at or above 60 being suggestive of elevated levels of anxiety (www.scaswebsite.com). Data from the SCAS: Child Version scales were collected prior to and following the completion of the 12-week, CCAL intervention.

Only three of the four participants were able to complete the SCAS: Child Version at both the pre- and post-intervention stages.<sup>3</sup> As mentioned previously, Sally turned a year older between pre- and post-intervention data collection stages. Because of this, her responses were compared with girls aged 8-11 years and girls aged 12-15 years, respectively.

### **Sally’s SCAS: Child Version Results**

During pre-intervention data collection, Sally reported significant problems on the Obsessive Compulsive, Social Phobia, and Physical Injury Fears scales. Moreover, Sally’s Total SCAS Anxiety Score fell within the elevated range when compared with

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<sup>3</sup> Matthew appeared incredibly anxious while attempting to complete the SCAS: Child Version. He tended to respond to questions using a “yes/no” format. Therefore, administration of this scale was discontinued. Matthew seemed more comfortable completing the SSS in the presence of his caregiver. These behaviors improved at the post-intervention phase.

girls within the same age group. Sally shared that she frequently made up stories in her mind in order to stop bad things from happening and was easily bothered by bad or silly thoughts. Additionally, Sally found it difficult to stop these types of thoughts from entering her mind. She often rechecked that she had completed tasks correctly and felt that she needed to do some things in just the right way in order to stop negative events from occurring. Many social problems were also endorsed, specifically in regard to feeling afraid that she would embarrass herself, which included fear of talking in front of her peers and worrying what others thought of her. Sally shared that she was scared to take tests and was frequently worried about performing poorly on her schoolwork. Fears of the dark, insects and spiders, and of being in high places were also endorsed to a significant degree. Scores from the remaining scales – Panic Attack and Agoraphobia, Separation Anxiety, and Generalized Anxiety Disorder – fell within normal limits.

Following completion of the CCAL intervention, Sally's previously mentioned concerns on the Obsessive Compulsive and Social Phobia scales significantly decreased within normal ranges. Furthermore, Sally's Total SCAS Anxiety Score was considered average at the post-intervention phase. Results from the Separation Anxiety scale remained within the average range for her age, but also showed a decrease between pre- and post-intervention phases. Sally continued to report fears of the dark and heights, but to a less significant degree, when compared with pre-intervention data. Decreases in fears related to parental separation, to being home alone, and to negative things happening to family members were described. However, newer fears of going to doctors and dentists arose and Sally continued to demonstrate a significant fear of spiders and



insects. Ratings from the Physical Injury Fears decreased slightly, yet remained in the elevated range at the post-intervention phase.

Increased ratings within the elevated ranges were observed on the Panic Attack and Agoraphobia and Generalized Anxiety Disorder scales. It should be noted that if Sally's ratings were compared with her previous age group norms (e.g., 8-11 year-olds), her post-intervention scores in these two areas would have been considered within normal limits. Nonetheless, newer concerns were endorsed when she traveled in a car, bus, or train and was in crowded places. Sally also reported more generalized feelings of worry about situations, when compared with pre-intervention data. Of the remaining items on these two scales, significant decreases in stomachaches, as they related to anxiety and worry, were noted by the participant. These findings are depicted in Figure 4.5 below.

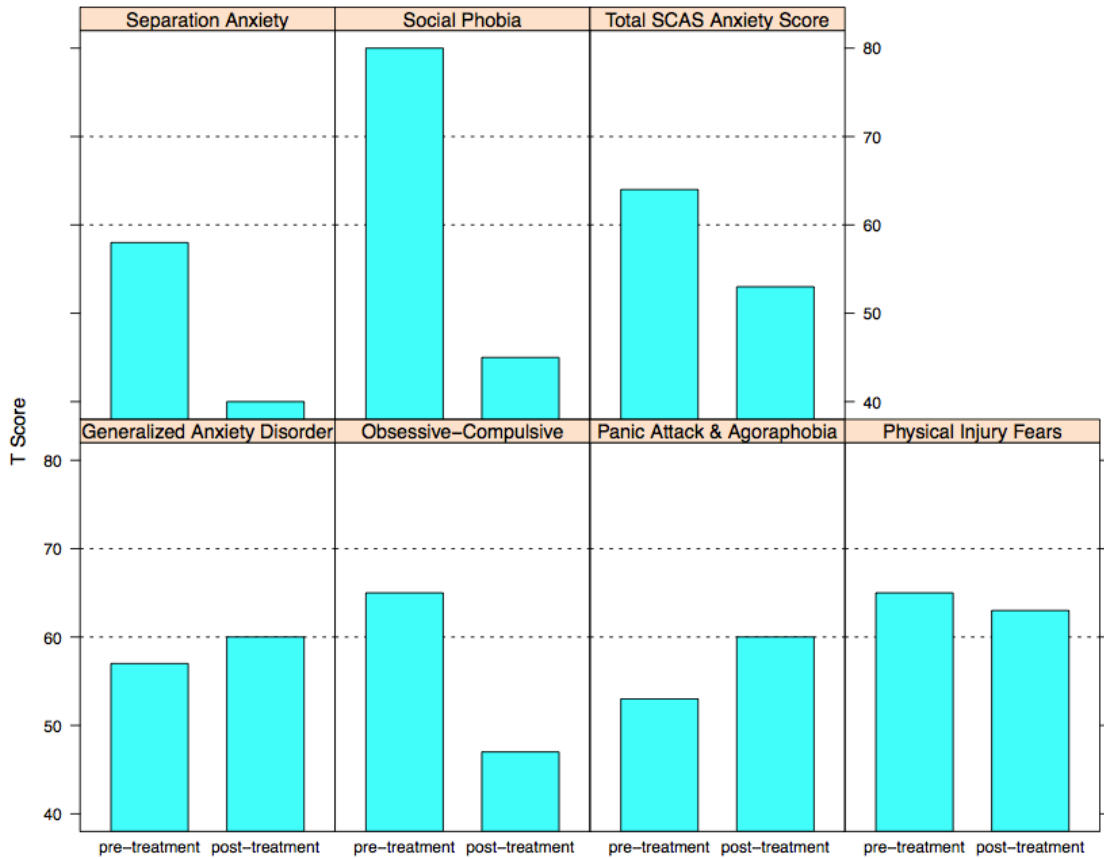


Figure 4.5. Sally’s Pre- & Post-Intervention SCAS: Child Version Results in Comparison to Same-Aged Females. Scores are depicted as *T*-scores.

**Sam’s SCAS: Child Version Results**

Sam’s pre-intervention data, as presented in Figure 4.6, showed average ratings on the Social Phobia, Panic Attack and Agoraphobia, and the Generalized Anxiety Disorder scales. More concerns were reported on the remaining subscales – Obsessive Compulsive, Separation Anxiety, and Physical Injury Fears scales. Additionally, Sam’s Total SCAS Anxiety Score fell within the elevated range when compared with boys within the same age group. An item analysis revealed frequent problems when rechecking that things were completed correctly and doing things in a particular manner

in order to stop bad things from happening. Sam also reported frequent fears about being away from his parents, as well as fears of doctors, insects, and the dark.

Sam's post-intervention data revealed decreases in reported problems on the Obsessive Compulsive and Social Phobia scales. Results from these scales were considered within the average range. Increased ratings were described on the Panic Attack and Agoraphobia, Separation Anxiety, and Generalized Anxiety scales, and similar scores within the elevated range were reported on the Physical Injury Fears scale. In turn, Sam's Total SCAS Anxiety Score was also slightly more elevated when compared with pre-intervention data. Items were indicative of more frequent problems related to feeling out of breath, trembling, and shaking, worrying about family members, and sleeping independently. Additional concerns were reported in regard to often feeling afraid and experiencing recurring thoughts that something bad may happen to him.

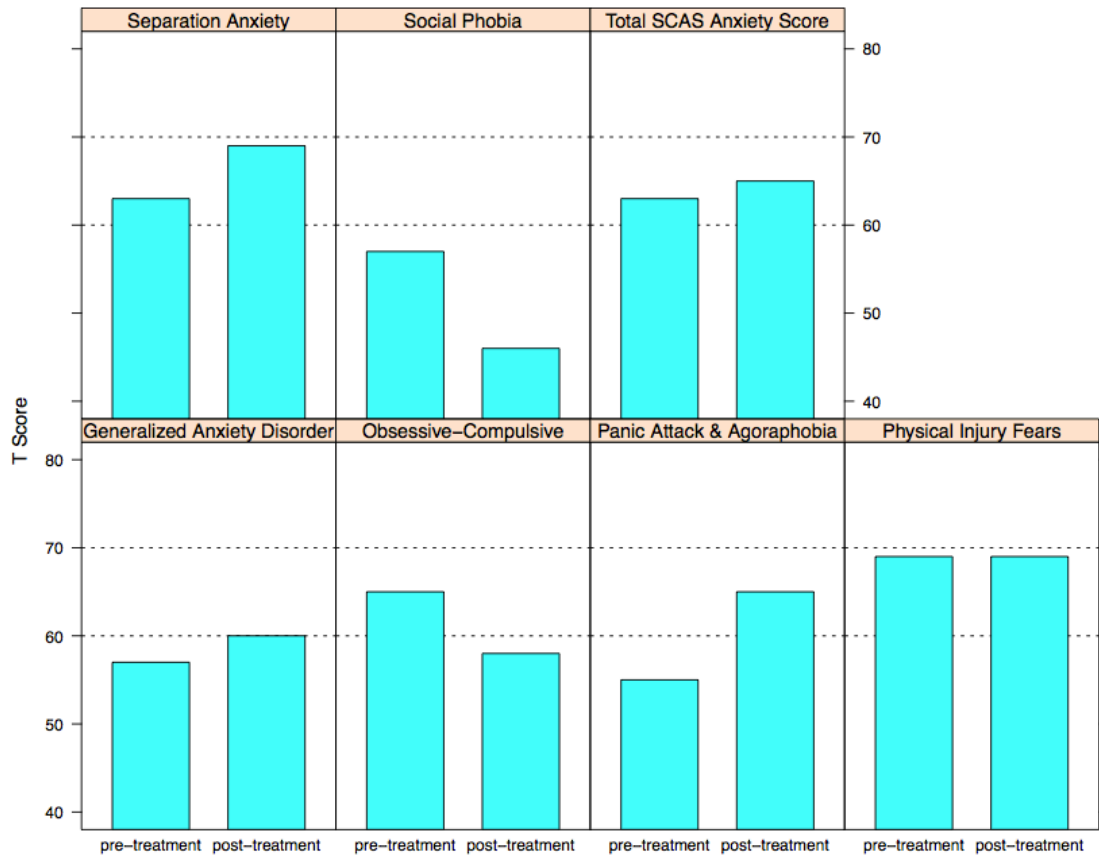


Figure 4.6. Sam’s Pre- & Post-Intervention SCAS: Child Version Results in Comparison to Same-Aged Males. Scores are depicted as *T*-scores.

**John’s SCAS: Child Version Results**

Prior to beginning the CCAL intervention, John’s Total SCAS Anxiety Score was considered within normal limits. When analyzing each of the subscales that comprise this overall score, it was noted that John provided responses within the average ranges in several areas, with the exceptions of the Obsessive Compulsive and Separation Anxiety scales. These two scales fell within the elevated range when compared with boys within the same age group. Items of significance included often needing to repeat activities, thinking of special thoughts to keep bad things from happening, and rechecking that

things were completed correctly. John also noted fears related to being away from his parents and being home alone.

Upon completion of the CCAL intervention, John reported less frequent problems on the Obsessive Compulsive and Separation Anxiety, and similar ratings within the average range were noted on the Physical Injury Fear and Generalized Anxiety Disorder scales. Increased concerns were described on the Social Phobia and Panic Attack and Agoraphobia scales, specifically in regard to worries about performing poorly on schoolwork and fear of small or enclosed spaces. Nonetheless, results from each of these subscales as well as the Total SCAS Anxiety Score yielded scores within the average range. Results from John's SCAS: Child Version at pre- and post-intervention phases are shown in Figure 4.7.

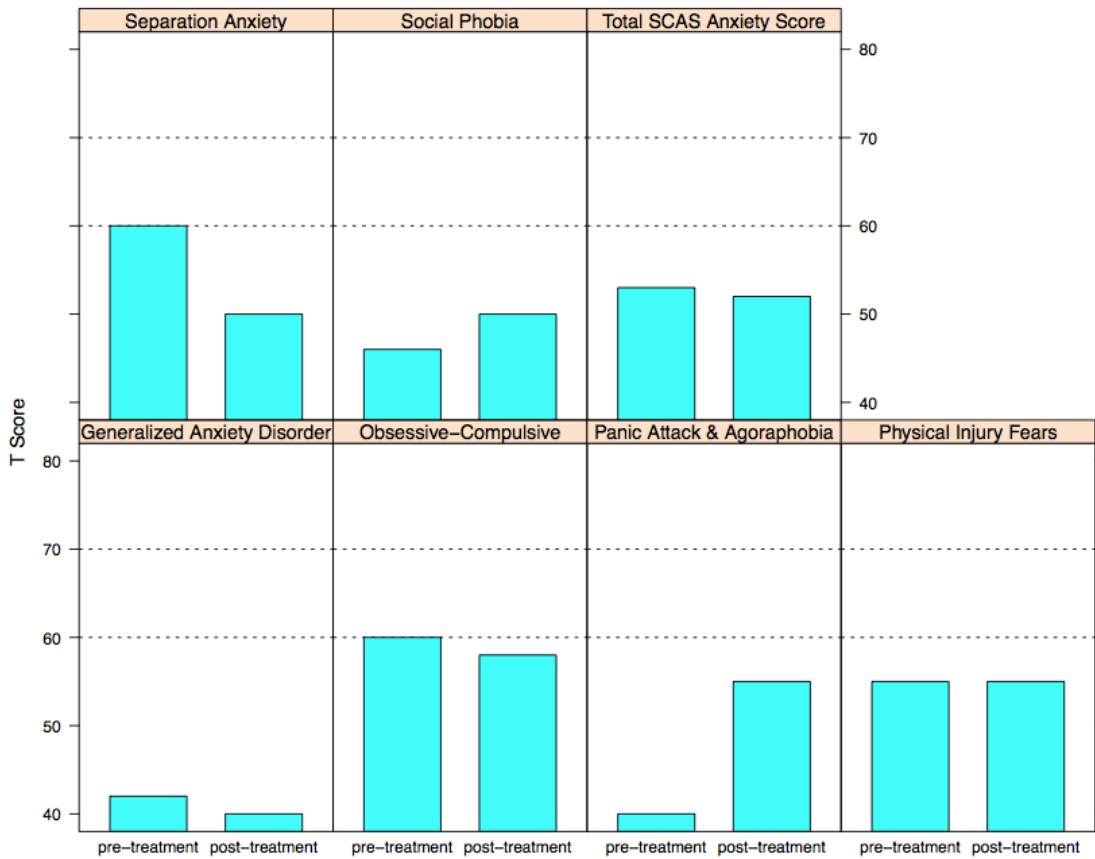


Figure 4.7. John’s Pre- & Post-Intervention SCAS: Child Version Results in Comparison to Same-Aged Males. Scores are depicted as *T*-scores.

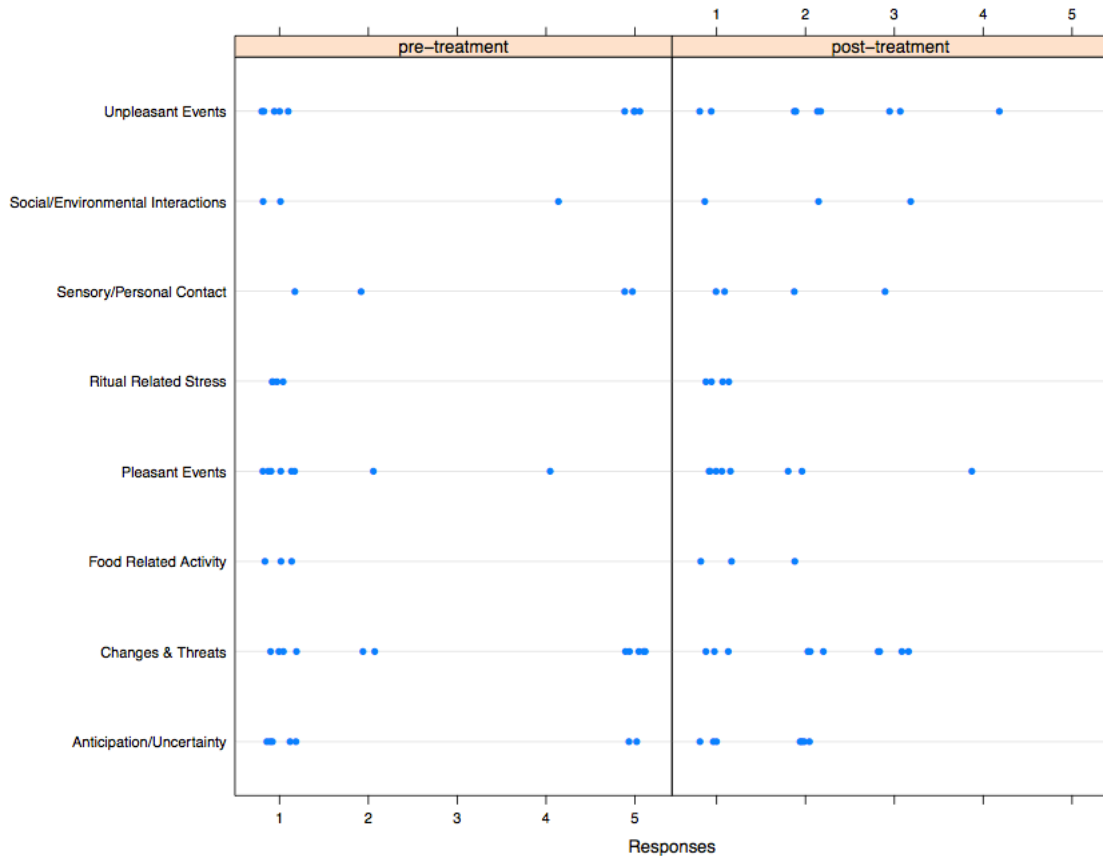
*Hypothesis 1c:* Participants will demonstrate a reduction in self-reported anxiety symptoms between pre- and post-test, as measured on the Stress Survey Schedule for Individuals with Autism and Other Pervasive Developmental Disabilities (SSS).

Each participant was asked to report on anxiety and stress-related symptoms, using the Stress Survey Schedule for Individuals with Autism and Other Pervasive Developmental Disabilities (SSS). It should be noted, however, that each child’s parent(s) were also present during administration of this scale. Participants were asked

by the researcher, in an interview format, to rate the level of intensity of a stress reaction to a series of situations or events. Ratings were provided using a 5-point Likert scale as follows: 1 = “None to Mild,” 2 = “Mild to Moderate,” 3 = “Moderate,” 4 = “Moderate to Severe” and 5 = “Severe.” Eight separate dimensions of stress were measured on the SSS including the following: Anticipation/Uncertainty, Changes and Threats, Unpleasant Events, Pleasant Events, Sensory/Personal Contact, Food Related Activity, Social/Environmental Interactions, and Ritual Related Stress (Goodwin et al., 2007). Raw scores were collected and analyzed at pre- and post-intervention phases. Normative information was unavailable for the SSS at the time of this study. Data analysis included standard summary statistics for each participant; these are depicted in the tables and dot plots that follow. Each point on the dot plot represents an item response, which has been jittered away from the exact integer in order to show the number of responses assigned to each rating.

### **Sally’s SSS Results**

Results from Sally’s self-report on the SSS (presented in Figure 4.8) showed decreases in post-intervention total scores on the Unpleasant Events, Anticipation/Uncertainty, Sensory/Personal Contact, and Changes and Threats subscales. Ratings on the Pleasant Events and Food Related Activity scales showed increases of one total point following completion of the CCAL intervention, but total scores on the Ritual Related Stress and Social/Environmental Interactions scales remained the same.



*Figure 4.8.* Sally's Pre- & Post-Intervention SSS Results. Each point on the dot plot represents an item response (Likert ratings between 1 and 5), which has been jittered away from the exact integer in order to show the number of responses assigned to each rating.

At the post-intervention phase, Sally reported moderate-to-severe levels of stress (denoted by a rating of “4”) when receiving a reprimand or a tangible reinforcement. However, no item was endorsed within the severe range at the post-intervention phase. Additionally, the proportion of Sally's responses for each of the scales clustered in the lower ranges (e.g., “1,” “2,” or “3”), which was suggestive of less intense stress reactions than reported at the pre-intervention phase (see Table 2).



Table 2

*Sally's Proportion of Moderate-to-Severe Responses on the SSS (ratings of "4" or "5")  
at Pre- & Post-Intervention Phases*

	<i>Pre-Test</i>	<i>Post-Test</i>
Anticipation/Uncertainty	29%	0%
Changes & Threats	45%	0%
Unpleasant Events	44%	11%
Pleasant Events	13%	13%
Sensory/Personal Contact	50%	0%
Food Related Activity	0%	0%
Social/Environmental Interactions	33%	0%
Ritual Related Stress	0%	0%

*Note:* Rounded to the nearest percent.

### **Sam's SSS Results**

Following completion of the CCAL intervention, decreases in total scores were revealed on the Sensory/Personal Contact, Pleasant Events, and Changes and Threats subscales. Conversely, increases in total scores were noted on each of the remaining scales at the post-intervention phase (see Figure 4.9). A post-intervention item analysis revealed that Sam continued to report significant levels of stress when waiting for preferred events or transportation and when being told "no" or receiving criticism or a reprimand. Elevated ratings were also endorsed when Sam was in the vicinity of noise or disruption by others, when touched, or when interrupted from engaging in a

ritual/routine. Sam reported increased levels of stress when observing a peer make a mistake or when a personal object of his was missing.

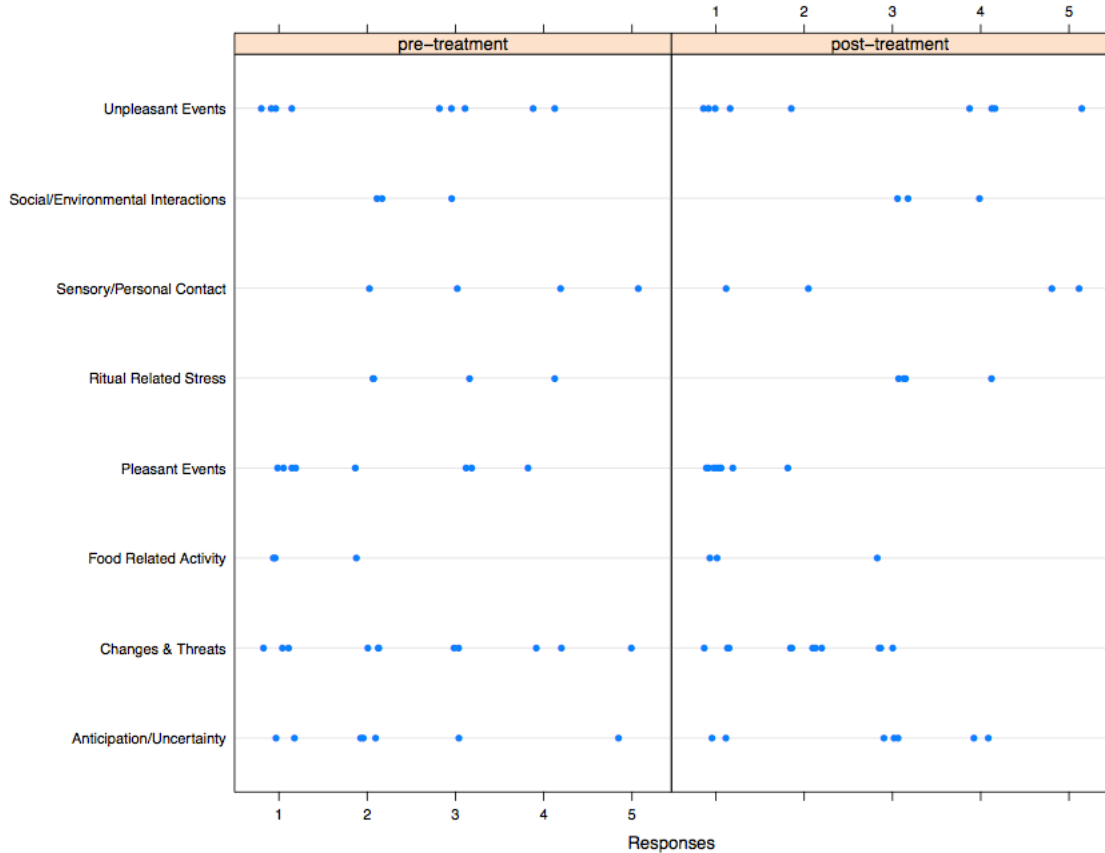


Figure 4.9. Sam’s Pre- & Post-Intervention SSS Results. Each point on the dot plot represents an item response (Likert ratings between 1 and 5), which has been jittered away from the exact integer in order to show the number of responses assigned to each rating.

As presented in Table 3, the proportion of responses within the elevated ranges (e.g., ratings of “4” and “5”) was greater following completion of the intervention on the Unpleasant Events, Social/Environmental Interactions, and Anticipation/Uncertainty scales. Decreases in the proportion of responses in this same range were observed on the

Pleasant Events and Changes and Threats scales; the three remaining scales – Sensory/Personal Contact, Ritual Related Stress, and Food Related Activity – were consistent with pre-intervention results.

Table 3

*Sam's Proportion of Moderate-to-Severe Responses on the SSS (ratings of "4" or "5") at Pre- & Post-Intervention Phases*

	<i>Pre-Test</i>	<i>Post-Test</i>
Anticipation/Uncertainty	14%	29%
Changes & Threats	36%	0%
Unpleasant Events	22%	44%
Pleasant Events	13%	0%
Sensory/Personal Contact	50%	50%
Food Related Activity	0%	0%
Social/Environmental Interactions	0%	33%
Ritual Related Stress	25%	25%

*Note:* Rounded to the nearest percent.

### **John's SSS Results**

Results from John's ratings on the SSS are shown in Figure 4.10. Decreases in total scores were observed on each of the scales at the post-intervention phase, with the exception of the Sensory/Personal Contact and Food Related Activity scales. Both of these scales showed an increase in total scores following implementation of the CCAL intervention.

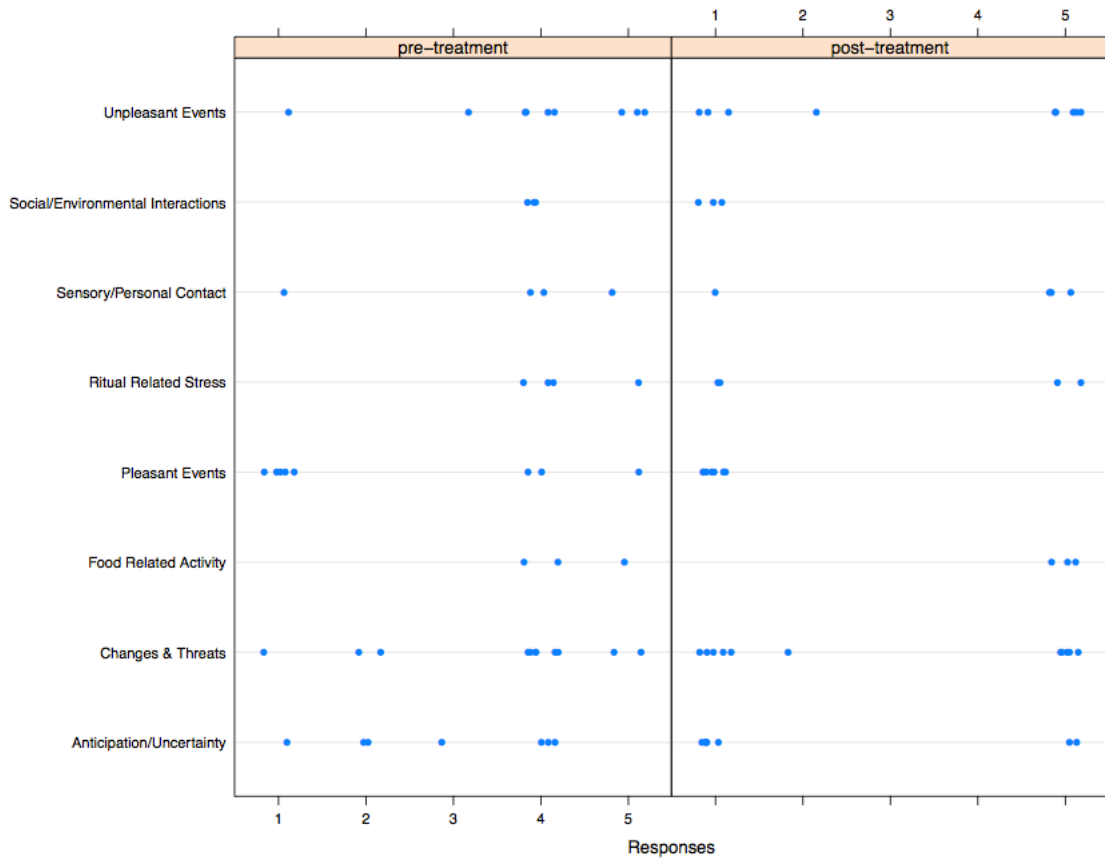


Figure 4.10. John’s Pre- & Post-Intervention SSS Results. Each point on the dot plot represents an item response (Likert ratings between 1 and 5), which has been jittered away from the exact integer in order to show the number of responses assigned to each rating.

Despite showing a more extreme type of response style during the post-treatment phases (e.g., ratings of “1” or “5”), the proportion of John’s responses within the elevated ranges – denoted by ratings of “4” or “5” – decreased on each of the scales except for the Sensory/Personal Contact and Food Related Activity scales. The proportion of elevated scores on these two scales remained the same when compared with pre-intervention data (see Table 4). An item analysis revealed that John continued to report significant levels

of stress when experiencing a change in task (engaging in a non-preferred activity), schedule, teacher, or environment (e.g., comfortable to uncomfortable, familiar to unfamiliar). Elevated levels of stress were also reported when having to wait at a restaurant, for food, for preferred events, or for reinforcement. John continued to be bothered when rituals/routines were interrupted, his schoolwork was marked as incorrect, or his personal objects were missing or out of order. Last, John reported intense levels of stress in the following situations: when attempting to communicate his needs verbally, being touched or disrupted by others, and in crowded situations or in the vicinity of extraneous noise.

Table 4

*John's Proportion of Moderate-to-Severe Responses on the SSS (ratings of "4" or "5") at Pre- & Post-Intervention Phases*

	<i>Pre-Test</i>	<i>Post-Test</i>
Anticipation/Uncertainty	43%	29%
Changes & Threats	73%	45%
Unpleasant Events	77%	56%
Pleasant Events	38%	0%
Sensory/Personal Contact	75%	75%
Food Related Activity	100%	100%
Social/Environmental Interactions	100%	0%
Ritual Related Stress	100%	50%

*Note:* Rounded to the nearest percent.

**Matthew's SSS Results**

According to Matthew's self-report ratings (shown in Figure 4.11), only the total score on the Unpleasant Events scale showed a decrease between pre- and post-intervention phases. Increases in total scores were observed on the Social/Environmental Interactions, Ritual Related Stress, Food Related Activity, and Changes and Threats subscales following implementation of the CCAL intervention. Ratings on the remaining scales were consistent across data collection periods. Following completion of the study, Matthew continued to report elevated concerns (denoted by ratings of "4" or "5") when having to transition from a comfortable, familiar, or preferred activity to a less desirable situation. In addition, Matthew reported increased levels of stress when going to the store, having a conversation, asking for help, and participating in group activities. Stress related to being in crowds or in the vicinity of noise or disruption by others was also reportedly problematic. Finally, Matthew reported problems related to waiting for food or reinforcement and being prevented from completing a ritual.

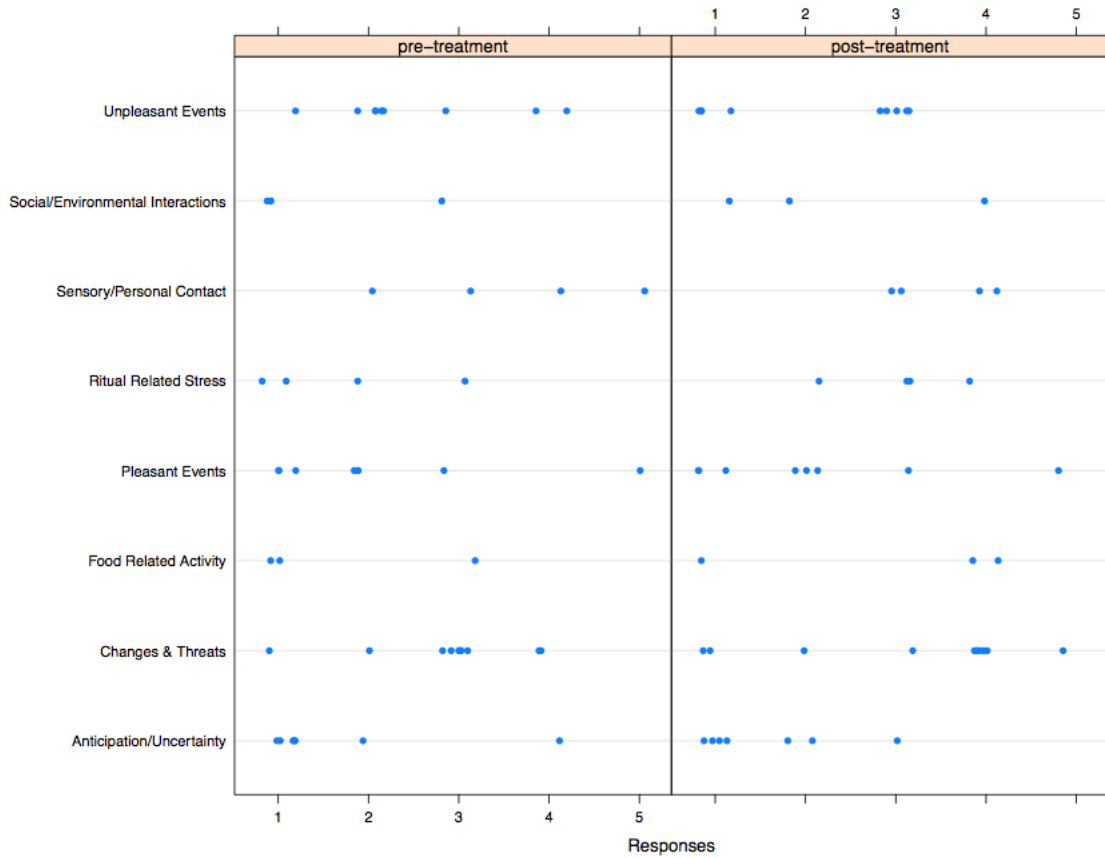


Figure 4.11. Matthew’s Pre- & Post-Intervention SSS Results. Each point on the dot plot represents an item response (Likert ratings between 1 and 5), which has been jittered away from the exact integer in order to show the number of responses assigned to each rating.

When analyzing the proportion of responses within the moderate-to-severe ranges (ratings of “4” or “5”), decreases were revealed on the Unpleasant Events and Anticipation/Uncertainty scales. Both of these scales had no responses above a rating of “3” following implementation of the CCAL intervention. The proportion of responses in the elevated ranges (rating of “4” or “5”) remained the same on the Sensory/Personal Contact and Pleasant Events scales, but increases were observed on the following scales:

Social/Environmental Interactions, Ritual Related Stress, Food Related Activity, and Changes and Threats (see Table 5 below).

Table 5

*Matthew's Proportion of Moderate-to-Severe Responses on the SSS (ratings of "4" or "5") at Pre- & Post-Intervention Phases*

	<i>Pre-Test</i>	<i>Post-Test</i>
Anticipation/Uncertainty	14%	0%
Changes & Threats	18%	64%
Unpleasant Events	22%	0%
Pleasant Events	13%	13%
Sensory/Personal Contact	50%	50%
Food Related Activity	33%	67%
Social/Environmental Interactions	0%	33%
Ritual Related Stress	0%	25%

*Note:* Rounded to the nearest percent.

*Research Question 2:* Does treating anxiety symptoms with the CCAL intervention decrease overall symptoms of ASD in participants?

*Hypothesis 2a:* Participants will demonstrate a reduction in observable ASD symptoms between pre- and post-test, as measured on the parents' reports from the Autism Spectrum Rating Scale (ASRS<sup>TM</sup>).



Each child's parent was asked to report on individual symptoms related to ASD, using the Autism Spectrum Rating Scales (ASRS<sup>TM</sup>): Parent Rating Form (6-18 Years). Participants were asked to determine how frequently a particular behavior had been observed during the previous four weeks. Ratings were recorded using a 5-point Likert scale, which included the descriptors "Never," "Rarely," "Occasionally," "Frequently," and "Very Frequently" (Goldstein & Naglieri, 2009). The ASRS provided quantitative information related to symptomology on the following subscales: 1] Social/Communication, 2] Unusual Behaviors, 3] Self-Regulation, 4] Peer Socialization, 5] Adult Socialization, 6] Social/Emotional Reciprocity, 7] Atypical Language, 8] Stereotypy, 9] Behavioral Rigidity, 10] Sensory Sensitivity, and 11] Attention. A Total Score and an overall DSM-5 Scale score was also provided.

Computerized ASRS software was used to convert raw scores into standardized *T*-scores. Data were scored using the DSM-5 scoring option as well as normative information based on the participant's sex and age. *T*-scores on the ASRS: Parent Rating Form (6-18 Years) are classified as follows: 40-59 = Average, 60-64 = Slightly Elevated, 65-69 = Elevated,  $\geq 70$  = Very Elevated. Data from the ASRS: Parent Rating Form (6-18 Years) were collected at pre- and post-intervention phases. The software's progress monitoring report function combined results from these two administrations in order to interpret any significant changes in the participant's observable behavior over time. The researcher set the level of statistical significance at the 10% level ( $p = .10$ ). Comparison data between administrations is reported using the following descriptors (Goldstein & Naglieri, 2009):

*Significant Increase:* The participant's behaviors have become more pronounced across administrations.

*Significant Decrease:* The participant's behaviors have decreased in severity across administrations.

*No Significant Change:* The participant's behavioral change was not statistically significant across administrations.

### **Sally's ASRS: Parent Rating Form Results**

At the pre-intervention phase, results from each of the scales ranged from the slightly elevated to very elevated ranges with the exception of behaviors measured on the Stereotypy scale. Thus, Sally was not described as engaging in stereotypical behaviors to a significant degree. In contrast, Sally reportedly had the greatest difficulties in the areas of Peer Socialization and Sensory Sensitivity, as denoted by parent ratings within the very elevated range. Sally's Total Score and DSM-5 Scale score were also considered elevated when compared to girls of the same age.

Based on information from the ASRS, Sally was observed to have significant difficulties understanding the feelings of others, noticing social cues, and initiating conversations with others. When spoken to by others, Sally often avoided looking at the person speaking. Per parent report, Sally was frequently observed to use an odd manner of speaking, focus on one subject for an extended period of time, or talk about things in which others did not show an interest. Because of this, Sally demonstrated problems interacting appropriately with her same-aged peers. Items of note on the Self-Regulation and Attention subscales were indicative of problems related to organization, waiting her

turn, focusing (easily distracted), completing schoolwork or chores, and remaining on-topic during discussions. Sally reportedly was bothered by some fabrics of clothing, showed strong reactions to changes in her routine (e.g., insisted on doing things the same way each time), and often resisted or overreacted to being touched.

Following completion of the CCAL intervention, scores from each of the subscales were not significantly different when compared with pre-intervention data (see Figure 4.12). In fact, eight of the eleven subscales showed increased *T*-scores during the second administration, which included results from the Stereotypy subscale. Ratings from the Stereotypy subscale were considered slightly elevated and suggestive of more concerns than observed during the pre-intervention phase. Of the scales that did not show increased *T*-scores – Self-Regulation, Sensory Sensitivity, and Attention scales – results remained within the elevated range. Last, Sally’s Total Score and DSM-5 Scale score yielded increases in *T*-scores within the very elevated range at the conclusion of the intervention.



Figure 4.12. Sally’s ASRS Results at Pre- and Post-Intervention Phases. Scores reported as T-scores.

**Sam’s ASRS: Parent Rating Form Results**

Prior to beginning the CCAL intervention, parent ratings from the ASRS revealed elevation on each of the subscales except on the Stereotypy subscale. Based on this information, Sam was not observed engaging in stereotypical behaviors to a significant degree. Per parent report, Sam was described as having the most difficulties on those behaviors measured on the Atypical Language scale. Ratings in this area were described within the very elevated range. Sam’s Total Score and overall DSM-5 Scale score were

also elevated and indicative of more concerns than are typically reported for a child his age.

Sam's mother reported that her son had some difficulties looking at others when speaking, understanding age-appropriate humor, and responding when spoken to by other children. Sam was observed to have problems engaging in age-appropriate social interactions with peers and adults, because he frequently argued with or interrupted others. Per parent report, Sam sometimes reversed pronouns when speaking, repeated words that were out-of-context to the situation, and used language that was considered immature for his chronological age. In addition, Sam often asked questions that were off-topic and tended to focus on one subject for an extended period of time. Behavioral rigidity in the forms of keeping certain objects with him at all times, insisting on completing things the same way each time, and needing things to happen just as expected were observed to a significant degree as well. Sam reportedly overreacted to smells and loud noises and could become easily distracted, which regularly impacted his ability to pay attention and complete tasks.

Upon completion of the CCAL intervention, data were not suggestive of any statistically significant changes from pre-intervention findings (see Figure 4.13). However, scores on the Self-Regulation and Atypical Language scales as well as the DSM-5 Scale and Total Score decreased across administrations. Despite these decreases in scores between pre- and post-intervention data collection, ratings on these scales continued to fall within the elevated ranges. Ratings from the Social/Communication, Peer Socialization, and Attention subscales yielded decreases in overall *T*-scores that were considered within the average range at the post-intervention phase. Ratings on the

Stereotypy subscale remained within normal limits. Finally, results from the remaining scales – Unusual Behaviors, Adult Socialization, Social/Emotional Reciprocity, Behavioral Rigidity, and Sensory Sensitivity – showed the same level of elevation as that observed during the pre-intervention phase or revealed increases in severity of symptoms.

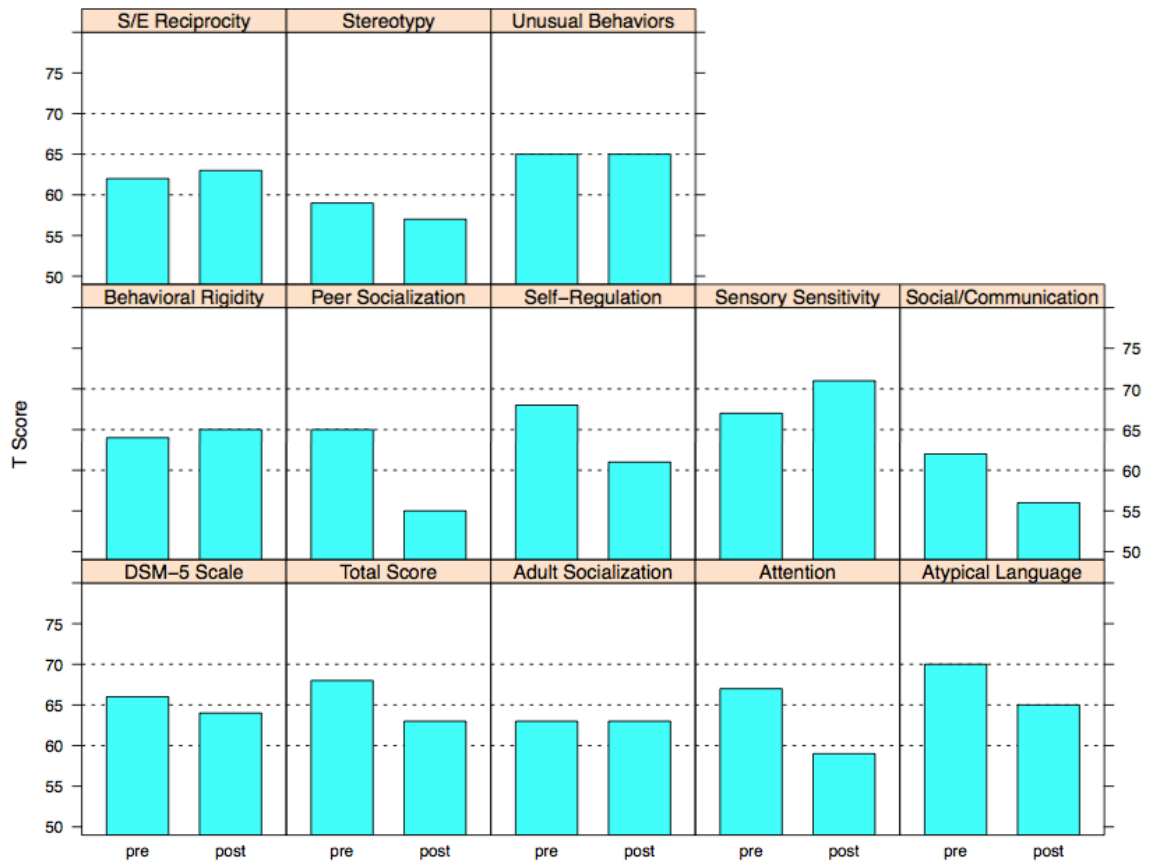


Figure 4.13. Sam’s ASRS Results at Pre- and Post-Intervention Phases. Scores reported as T-scores.

**John’s ASRS: Parent Rating Form Results**

According to the parent’s report, elevation was observed on each of the ASRS scales at the pre-intervention phase except the Sensory Sensitivity and Attention subscales. Ratings from these scales fell within the average range. Results within the

very elevated range were revealed on the Unusual Behaviors, Peer Socialization, Adult Socialization, Atypical Language, and Behavioral Rigidity subscales as well as the DSM-5 Scale and the Total Score prior to the start of the CCAL intervention.

Based on items from the ASRS, John was described as having significant difficulties interacting with adults and same-aged children. He was sometimes observed looking at others when speaking to them, yet often avoided making eye contact when in trouble or experiencing a problem. He reportedly used language that was immature for his age, because John was frequently observed talking about things that were uninteresting to others, repeating certain words or phrases out-of-context, and showing difficulties understanding how others felt. Additionally, John was frequently observed having difficulties understanding humor or jokes, starting conversations with others, as well as noticing social cues. He often demonstrated a preference for being alone, because he rarely shared fun activities or sought out the company of others. Insistence on certain routines (e.g., demonstrated a strong reaction to changes in routines), keeping objects with him at all times, and lining up objects in a particular order were observed. Moreover, problems with attention were observed to a significant degree, especially when John was required to complete tasks and chores or refrain from interrupting others. Per parent report, certain fabrics and tags in his clothing also easily bothered John.

Results from post-intervention data collection, as presented in Figure 4.14, did not yield statistically significant changes across administrations. However, decreases in *T*-scores were observed on each of the subscales with the exceptions of the Stereotypy and Attention scales. Ratings on the Stereotypy scale increased slightly, but data from the Attention and Sensory Sensitivity scales yielded consistent scores within the average

range across administrations. John’s overall DSM-5 Scale and Total Score revealed decreases between pre- and post-intervention phases. Findings in these two areas remained areas of concern yet were no longer considered within the very elevated range.

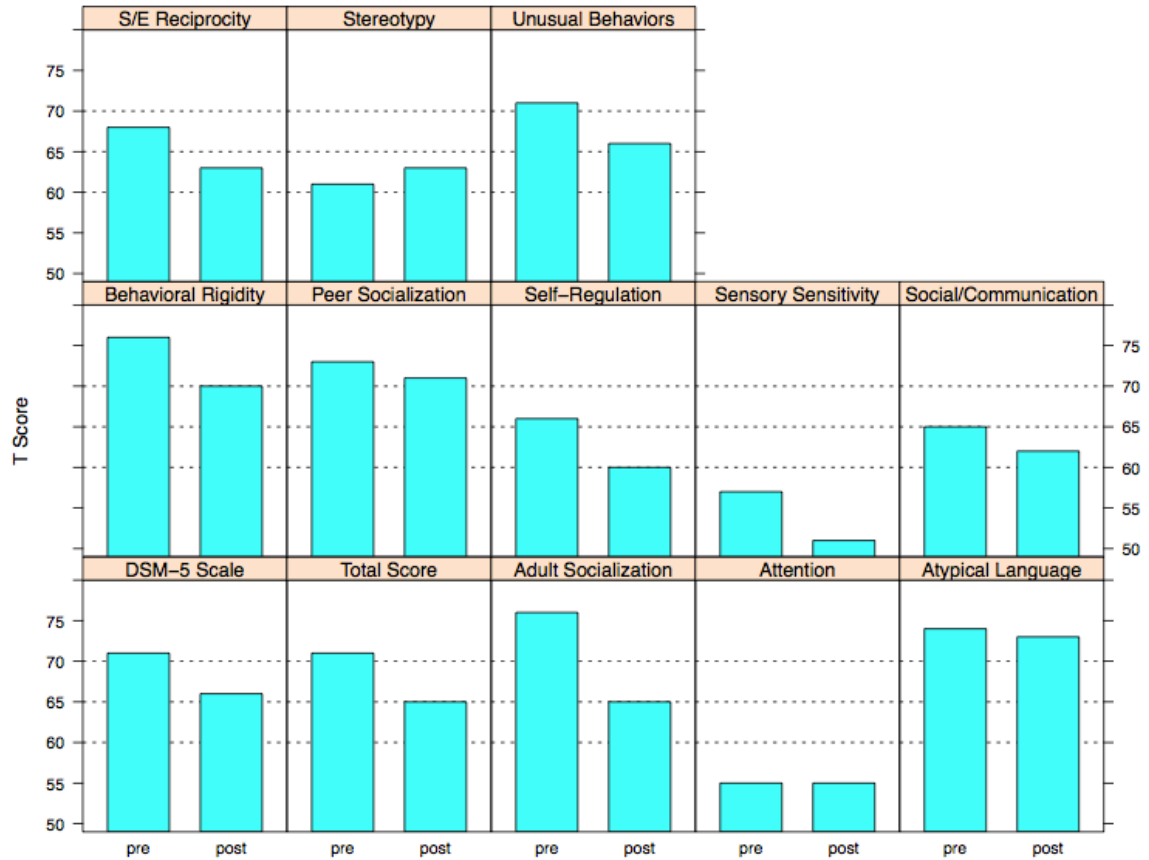


Figure 4.14. John’s ASRS Results at Pre- and Post-Intervention Phases. Scores reported as T-scores.

**Matthew’s ASRS: Parent Rating Form Results**

At the beginning of the study, Matthew’s parents reported concerns on each of the subscales of the ASRS, with exceptions observed on the Self-Regulation, Adult Socialization, and Attention subscales. Ratings from these three areas were considered within the average range when compared with same-aged peers. Matthew was described



as having the greatest behavioral difficulties, per ratings within the very elevated range, in the areas of Unusual Behaviors, Atypical Language, Stereotypy, Behavioral Rigidity, and Sensory Sensitivity subscales. In addition, Matthew's overall DSM-5 Scale score and Total Score were considered within the very elevated range.

An item analysis revealed that Matthew demonstrated significant difficulties looking at others when speaking to them, starting and maintaining conversations, and noticing social cues. He often demonstrated difficulties understanding and showing interest in others' feelings and ideas, because Matthew tended to talk about topics, for extended periods of time, that were solely of interest to him. In addition, Matthew frequently repeated words and phrases out-of-context and avoided looking at an adult when there was a problem. Per parent report, Matthew often chose to play and engage in leisure activities independently. Needs were endorsed when playing with objects appropriately, because Matthew frequently became fascinated by the parts of objects and/or smelled, tasted, or attempted to eat inedible objects. Matthew often insisted on maintaining certain routines, keeping things with him at all times, and lining up objects in a row. Last, Matthew was described as having difficulties engaging in tasks that required sustained effort.

Upon completion of the CCAL intervention, no statistically significant changes were revealed when compared with pre-intervention data (see Figure 4.15). Decreases in *T*-scores were observed in few areas including behaviors measured on the Behavioral Rigidity, Social/Emotional Reciprocity, and Unusual Behaviors scales. However, scores from these three scales remained within the "slightly elevated," "elevated," and "very elevated" ranges, respectively, at the conclusion of the study. Results from the Self-

Regulation scale remained within the average range across administrations, yet the same “very elevated” score in the area of Sensory Sensitivity was also observed. Each of the remaining scales revealed increased *T*-scores within the elevated ranges at the post-intervention phase. Data from the Adult Socialization and Attention subscales yielded slightly elevated results, but more concerns within the very elevated range were described on the Peer Socialization, Atypical Language, and Stereotypy subscales. Additionally, results from the Social/Communication scale revealed an increased *T*-score, although results remained within the elevated range. Matthew’s Total Score and overall DSM-5 Scale score showed decreases between pre- and post-intervention phases; however, ratings continued to be described within the elevated to very elevated ranges.

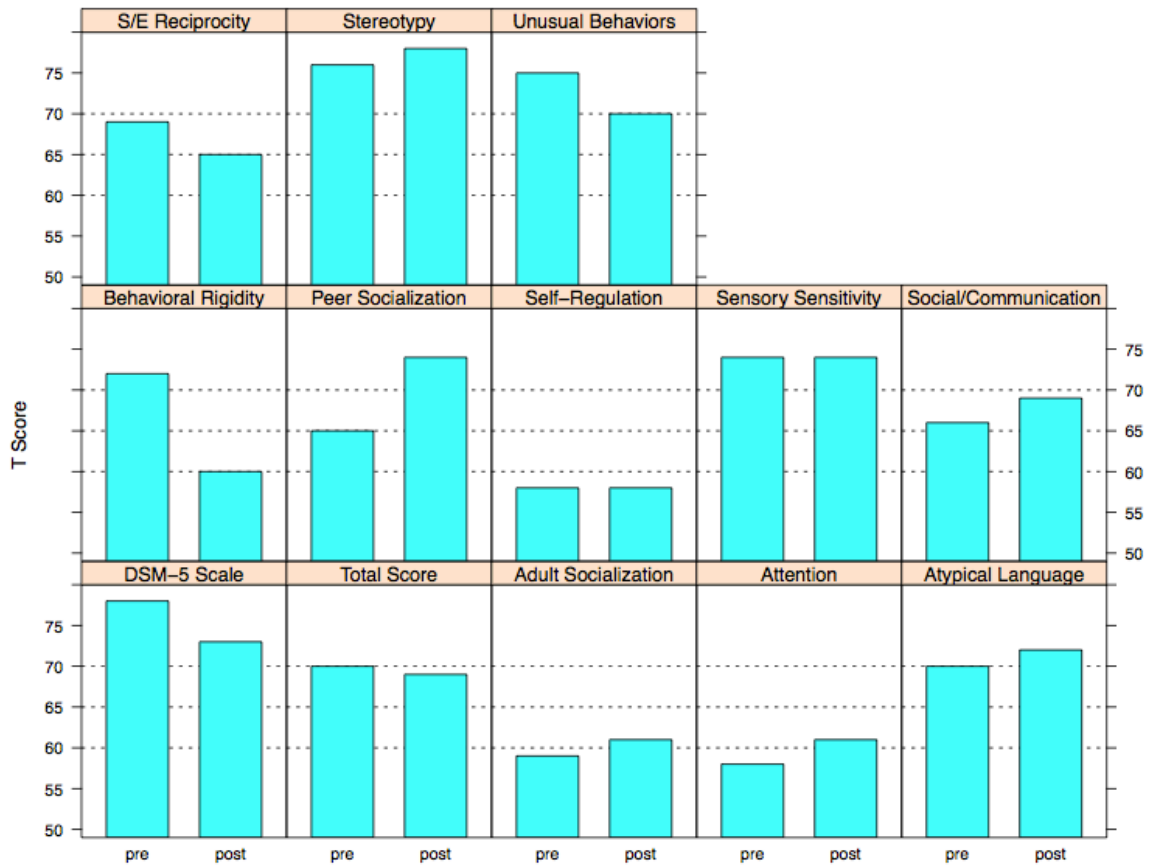


Figure 4.15. Matthew’s ASRS Results at Pre- and Post-Intervention Phases. Scores reported as *T*-scores.

*Research Question 3:* Does the CCAL intervention improve executive function skills in children with ASD and anxiety symptoms?

*Hypothesis 3a:* Participants will demonstrate improvement in attentional control and cognitive switching skills, as measured on the TEA-Ch Creature Counting subtest.

*Hypothesis 3b:* Participants will demonstrate improvement in sustained attention and response inhibition skills, as measured on the TEA-Ch Walk, Don't Walk subtest.

*Hypothesis 3c:* Participants will demonstrate improvement in attentional control and cognitive switching skills, as measured on the TEA-Ch Opposite Worlds subtest.

As part of this study, participants were administered three of the nine subtests available on the Test of Everyday Attention for Children (TEA-Ch; Manly et al., 1999). The Creature Counting, Walk, Don't Walk, and Opposite Worlds tasks were chosen in order to measure participants' executive function skills in the areas of attentional control, cognitive switching, sustained attention, and response inhibition. Version A of the TEA-Ch was administered during pre-intervention data collection, followed by administration of Version B upon each participant's completion of the CCAL intervention. Raw scores were converted to scaled scores, which had a mean or average score of 10 and a standard deviation of 3. Participants' performances were compared with normative information based on the child's sex and age with results depicted in Figures 4.16 to 4.19 in the sections below.

On the first task, Creature Counting, participants were asked to switch between counting creatures presented on the test book pages in an upward or downward manner. Upward and downward facing arrows presented on the page served as indicators that the participant needed to switch the direction he/she was counting. In addition, the participant needed to begin counting from the last number that was said before the

switch. Accuracy and completion times were recorded as scaled scores and percentile bands during this task.

Next, participants were administered the Walk, Don't Walk subtest, which measured sustained attention and response inhibition skills. Participants were asked to "take a step" by making a mark on a presented path when a particular sound was presented from an audio recording. In addition, participants were required to refrain from making a mark on the page when a second sound was heard. Twenty trials were presented on each version of this task. Additionally, sounds presented on the audio recording increased in speed as the task progressed, requiring participants to become increasingly vigilant to avoid falling into an automatic style of responding. The total number of accurate responses observed across trials (total possible raw score = 20) was calculated and converted into scaled scores and percentile bands.

Finally, participants completed two conditions on the Opposite Worlds subtest. The Same World condition required participants to name a series of ones and twos shown on the test book pages as quickly as possible. During the Opposite World condition, participants needed to inhibit their automatic responses of naming the presented digits as shown, and instead perform cognitive switching by reversing the labels for each number. Thus, participants were to name the number one as "two" and the number two as "one" throughout the Opposite World conditions. The speed with which the participant could complete this task was recorded. Performances were again scored using scaled scores and percentile bands. Separate scores for the Same World and Opposite World conditions are provided.

**Sally's Performance on the TEA-Ch**

Sally's performance on the Creature Counting subtest fell within the high average range across test administrations. In fact, she was able to respond to each item accurately on both trials, yielding the same scaled score at pre- and post-intervention phases. Therefore, a significant change in performance in terms of the Total Correct scores was not observed. Sally's Timing Score, which took into account the total completion time for correct items, compared with the total number of switches for correct items, was described within the average range across administrations. Her completion time was slightly faster during the second administration, yet a significant change in performance was not supported.

Above average performance was observed across administrations on the Walk, Don't Walk subtest. Sally was able to respond accurately to each test item during administration of both versions of the TEA-Ch. Thus, a significant change in performance was not observed.

During pre-intervention data collection on the Opposite Worlds subtest, Sally demonstrated average performances on the Same World and Opposite World conditions. These scores indicated that Sally was able to complete both conditions accurately and in a timely manner. Increased scaled scores were observed during the second test administration on both conditions. However, these changes in scores were not considered statistically significant.



Figure 4.16. Sally’s Performance on the TEA-Ch at Pre- and Post-Intervention Phases.

Results are reported as scaled scores.

**Sam’s Performance on the TEA-Ch**

Sam’s level of accuracy on both versions of the Creature Counting subtest, as measured by the Total Correct scores, fell within the above average range when compared with same-aged boys. In addition, no errors were observed across test administrations. Therefore, a significant change in performance at pre- and post-intervention phases was not supported. During the second administration of the Creature Counting subtest, Sam was noted as taking slightly more time while counting and completing the presented items. However, his overall Timing Score remained within the above average range and was not considered significantly different from his first trial performance.

During the first administration of the Walk, Don't Walk subtest, Sam was able to complete each item accurately, yielding a score within the above average range. He was noted as making a few errors during the second administration of this task, which resulted in a decreased scaled score. Sam's post-intervention score was still considered within the average range. However, a decrease of this size (observed only in an estimated 5% of children) was suggestive of a significant decline in performance.

Sam's performance on the Same World condition of the Opposite Worlds subtest fell within the average range across test administrations. Slightly faster completion times were observed during the pre-intervention phase, when compared with the post-intervention phase. Thus, a decrease in his overall scaled score was revealed, yet was not indicative of a statistically significant decline in performance. In contrast, Sam's performance on the Opposite World condition improved across test administrations. Both scores, however, were described within the low average range for his chronological age and were not suggestive of a significant change in performance.



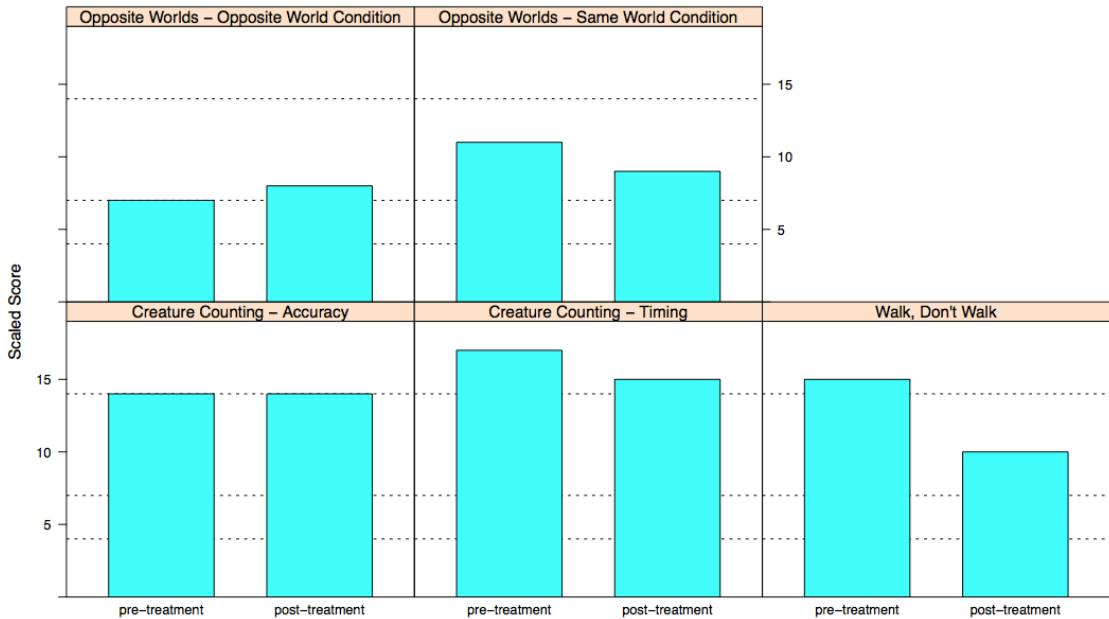


Figure 4.17. Sam’s Performance on the TEA-Ch at Pre- and Post-Intervention Phases.

Results are reported as scaled scores.

**John’s Performance on the TEA-Ch**

John was unable to complete any items correctly on the Creature Counting subtest. This pattern of performance was observed across test administrations, yielding Total Correct scores within the extremely low range. Thus, a significant change in performance was not observed. Because of the number of errors observed, a Timing Score for this subtest could not be calculated during the pre- or post-intervention phases.

Improvement in performance was observed on the Walk, Don’t Walk subtest, as revealed by an increased scaled score at the post-intervention phase. John’s scores increased from the extremely low to below average ranges across test administrations. However, his performance was not indicative of a significant level of improvement when compared with normative information.

Last, John was observed taking an extended period of time to complete items on both conditions of the Opposite Worlds task. This pattern of performance was observed across test administrations as well. Therefore, his performances on both conditions and trials were described within the extremely low range for his chronological age and were not indicative of any significant changes in performance.

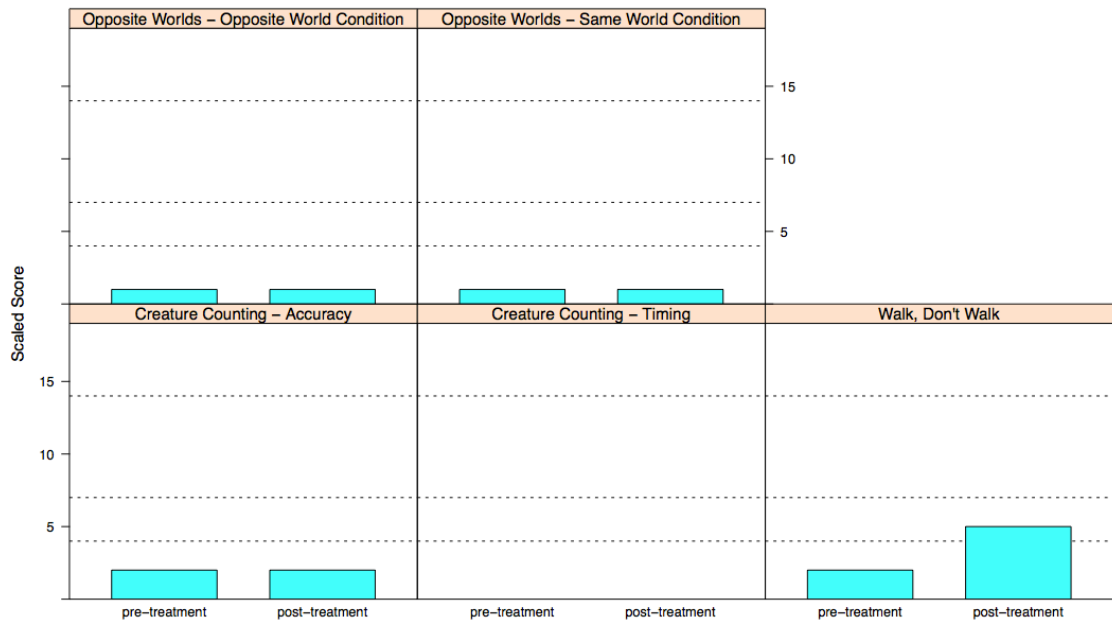


Figure 4.18. John’s Performance on the TEA-Ch at Pre- and Post-Intervention Phases. Results are reported as scaled scores.

**Matthew’s Performance on the TEA-Ch**

During the Creature Counting subtest, Matthew performed within the below average ranges across test administrations. However, he was unable to respond accurately to any of the presented items during the post-intervention condition, which led to a decrease in his Total Correct score. This decline in performance was not considered statistically significant. Matthew also tended to work at a much slower pace than

expected for his chronological age, resulting in an extremely low Timing Score during the pre-intervention phase. Due to multiple errors observed during the second administration, Timing and Difference Scores could not be calculated.

Matthew's performance on the Walk, Don't Walk subtest was considered within the extremely low range at pre- and post-intervention phases. Nonetheless, improvements in his level of accuracy, which led to an increased scaled score, were observed at the second test administration. However, observed changes in performance were not considered statistically significant.

Finally, Matthew's scaled score on the Same World condition remained the same across test administrations. In fact, he completed this condition of the Opposite Worlds subtest in the same amount of time at pre- and post-intervention phases. His timing was considered slower than expected for his chronological age. Therefore, his Same World performances fell within the extremely low range and were not suggestive of significant changes between pre- and post-intervention trials. Conversely, Matthew's performance improved (e.g., completed items more quickly) between trials on the Opposite Worlds condition. However, Matthew's performance continued to be within the extremely low range across administrations and was not suggestive of a significant level of improvement when compared with normative information.

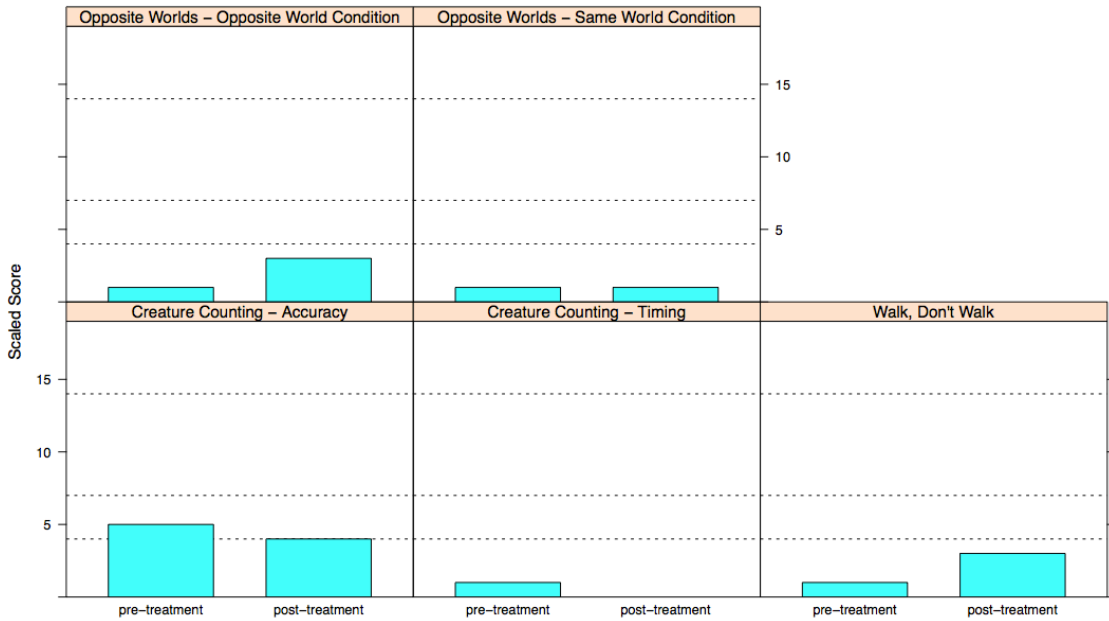


Figure 4.19. Matthew's Performance on the TEA-Ch at Pre- and Post-Intervention

Phases. Results are reported as scaled scores.

## Chapter 5: Discussion

Four adolescents with ASD and increased anxiety symptoms participated in this study, which included implementation of the 12-week, CCAL intervention. Information from parent and self-reports as well as data from direct cognitive testing are summarized in an effort to address the study's research questions and supporting hypotheses.

### Summary of Findings

*Research Question 1:* Does implementation of the CCAL intervention reduce overall symptoms of anxiety in children with ASD?

Data from the SCAS: Parent Version, SCAS: Child Version, and SSS revealed that the CCAL intervention was generally successful for decreasing some symptoms of anxiety for each of the four participants. However, results were inconsistent across scales, subscales, and participants. This variable pattern was also observed on parent and self-report measures. Therefore, results did not appear to be affected by the participant's age, gender, or level of intelligence.

According to parents' reports from the SCAS, all but one participant (Matthew) showed decreases in their Total Anxiety Score between pre- and post-intervention phases. In addition, one of the three participants had a Total Anxiety Score more similar to that of the non-clinical comparison sample (Sally), and the other two participants' Total Anxiety Scores fell between the means for the non-clinical and anxiety disordered samples (Sam and John). The fourth participant's Total Anxiety Score increased following the completion of the CCAL intervention. Similarly, each of the participant's parents, with the exception of Matthew's parent, reported decreases or consistently low ratings on the majority of subscale scores at the post-intervention phase. An analysis of Matthew's

post-intervention data yielded relatively low scores across administrations for one subscale and a decrease in only one other area. Results from these two subscales were more closely similar to the mean scores of the non-clinical comparison group. The remaining four subscales showed increases in anxiety symptoms since the start of the CCAL intervention.

Only three of the four participants were able to report information adequately regarding their anxiety symptoms on the SCAS: Child Version. Thus, data were collected solely from Sally, Sam, and John. Two of the three participants, Sally and John, showed decreases in Total Anxiety Scores following implementation of the CCAL intervention. However, John's Total Anxiety Scores were considered within normal limits at the start and at the completion of this study, but Sally began the study with a Total Anxiety score within the elevated range. Sam's Total Anxiety Score remained within the elevated range across pre- and post-intervention phases, yet also slightly increased at the completion of the study.

An analysis of subscale data from the SCAS: Child Version revealed inconsistent patterns across participants. Upon completion of the CCAL intervention, Sally reported fewer concerns in three areas, two of which were described within the average range (Obsessive Compulsive and Social Phobia), and the third remained within normal limits across administrations (Separation Anxiety). Ratings on the Physical Injury Fears scale decreased slightly yet continued to be elevated for her age. Increased problems within the elevated ranges were also reported in two areas – Panic Attack and Agoraphobia and Generalized Anxiety Disorder – which were not described as areas of concern at the start of the study.

Data from Sam's SCAS report showed increases on three of the six subscales (Panic Attack and Agoraphobia, Separation Anxiety, Generalized Anxiety Disorder), all of which yielded scores within the elevated range at the post-intervention phase. One subscale remained elevated across administrations (Physical Injury Fears) and scores from the two remaining subscales – Obsessive Compulsive and Social Phobia – were lower at the end of the study. However, ratings from the Social Phobia and Obsessive Compulsive subscales remained either within the average or elevated ranges, respectively.

John's SCAS pre-intervention data revealed two areas of concern, as denoted by scores within the elevated range on the Obsessive Compulsive and Separation Anxiety scales. However, fewer concerns were reported in these areas following completion of the study. Scores in both of these areas were considered average when compared with scores of boys of the same-age. In addition, ratings from the Generalized Anxiety Disorder and Physical Injury Fears scales remained within normal limits across administrations. Increased concerns were observed on two scales, Social Phobia and Panic Attack and Agoraphobia, yet standard scores in both of these areas were considered within normal limits upon completion of the CCAL intervention.

Each of the four participants completed the SSS in the presence of a caregiver and the researcher. Similar to the previously mentioned findings, results from the SSS varied across subscale scores and participants. Standard summary statistics were used to analyze participant data because no normative information was available for this measure.

Results from Sally's self-report showed decreases in total scores on four of the eight subscales (Unpleasant Events, Anticipation/Uncertainty, Sensory/Personal Contact, and Changes and Threats), but scores on two other scales (Ritual Related Stress and Social/Environmental Interactions) remained the same across administrations. An increase of one point was observed on each of the two remaining scales, Pleasant Events and Food Related Activity. However, upon completion of the CCAL intervention, none of the items from the SSS yielded a rating in the severe range (denoted by a rating of "5") and the proportion of responses for each subscale was suggestive of fewer intense stress reactions to a variety of stimuli.

Decreases on three of the eight subscales were observed on Sam's SSS post-intervention data (Sensory/Personal Contact, Pleasant Events, and Changes and Threats), yet each of the remaining subscales showed increased scores. The proportions of responses within the severe range (rating of "5") decreased in two areas (Pleasant Events and Changes and Threats), increased on three subscales (Unpleasant Events, Social/Environmental Interactions, and Anticipation/Uncertainty), and were consistent across administrations on the three remaining subscales (Sensory/Personal Contact, Ritual Related Stress, and Food Related Activity).

John's SSS post-intervention data yielded more favorable findings because all but two subscales showed a decrease in total scores when compared with baseline data. Ratings from the Sensory/Personal Contact and Food Related Activity subscales showed increases in total scores, and the proportion of responses in the elevated ranges (ratings of "4" or "5") remained the same across administrations. The proportion of responses in the elevated range decreased for each of the remaining scales. It is important to note that the



participant tended to demonstrate a more extreme response style during post-intervention data collection (rated most items as a “1” or “5”), which may have confounded the findings for this measure.

Last, variable findings were observed between Matthew’s pre- and post-intervention data for the SSS. Decreases in total scores were observed in one area (Unpleasant Events); four subscales showed increases across administrations (Social/Environmental Interactions, Ritual Related Stress, Food Related Activity, and Changes and Threats), and three subscale scores did not change (Sensory/Personal Contact, Pleasant Events, and Anticipation/Uncertainty). The proportions of responses within the moderate-to-severe ranges (ratings of “4” or “5”) decreased on two subscales (Unpleasant Events and Anticipation/Uncertainty) and increased on four subscales (Social/Environmental Interactions, Ritual Related Stress, Food Related Activity, and Changes and Threats). The remaining two subscales (Sensory/Personal Contact and Pleasant Events) yielded consistent proportions of responses in the elevated ranges as those observed during the pre-intervention phase.

*Research Question 2:* Does treating anxiety symptoms with the CCAL intervention decrease overall symptoms of ASD in participants?

Symptoms of ASD were measured at pre- and post-intervention phases via parent report on the ASRS. Across each of the raters’ reports, no statistically significant changes in performance were observed on the ASRS Total Score, DSM-5 Scale, or any of the subscale scores. However, results were suggestive of some reduced symptomology, as denoted by decreases in *T*-scores following completion of the CCAL intervention. In

general, results were inconsistent across scales and subscales when analyzed between and within participants' report profiles.

Total Scores and DSM-5 Scale scores decreased across administrations for three of the four participants. Data from Sam and John's reports revealed decreases in levels of severity for these two areas of the ASRS, yet post-intervention scores continued to be remarkable for observable concerns when compared with same-aged children's scores. Matthew's Total Score and DSM-5 Scale score decreased from pre-intervention findings, but continued to fall within the very elevated range upon completion of the study. Increased concerns were found solely on Sally's ASRS report. Pre-intervention scores in these two areas were very much elevated and remained within this level of severity at the second data administration.

As mentioned previously, variability on ASRS subscale scores were also observed between and within participants' score reports. According to ratings from Sally's parents, *T*-scores on eight of the eleven subscales of the ASRS increased from recorded pre-intervention data. This included ratings on the Stereotypy scale, which revealed results within normal limits at the start of the study. The three remaining scales (Self-Regulation, Sensory Sensitivity, and Attention) continued to be elevated upon completion of the CCAL intervention, although slight decreases in *T*-scores were observed.

Sam's mother reported decreased concerns in several areas following completion of the CCAL intervention. For instance, post-intervention results from the Social/Communication, Peer Socialization, and Attention subscales fell within the average range when compared with same-aged children. In addition, ratings from the Self-Regulation and Atypical Language scales decreased in level of severity yet

continued to be areas of concern as denoted by scores in the slightly elevated and elevated ranges, respectively. Per parent report, *T*-scores on the Stereotypy scale remained within normal limits across administrations, but remaining subscales (Unusual Behaviors, Adult Socialization, Social/Emotional Reciprocity, Behavioral Rigidity, and Sensory Sensitivity) revealed similar or increased elevated symptoms when compared with pre-intervention data.

Upon completion of the study, *T*-scores on John's ASRS report decreased at the post-intervention phase on each subscale, with the exception of the Stereotypy and Attention subscales. Scores from the Stereotypy subscale increased, but remained within the slightly elevated range. The same average score was obtained on the Attention subscale at pre- and post-intervention phases. Ratings from the Sensory Sensitivity scale decreased, but were described within normal limits across administrations.

Finally, Matthew's mother reported limited concerns on the Self-Regulation subscale, as denoted by average scores across pre- and post-intervention data collections. Decreases in *T*-scores were observed on the Behavioral Rigidity, Social/Emotional Reciprocity, and Unusual Behaviors subscales, yet post-intervention results continued to fall within the elevated ranges for his chronological age. The same score was obtained on the Sensory Sensitivity subscale, which was suggestive of significant observable symptoms and concerns in this area. In addition, results from each of the remaining scales – Social/Communication, Peer Socialization, Adult Socialization, Atypical Language, Stereotypy, and Attention – showed increased scores within the elevated ranges at the post-intervention phase.

*Research Question 3: Does the CCAL intervention improve executive function skills in children with ASD and anxiety symptoms?*

Data collected via direct testing using the TEA-Ch did not reveal statistically significant changes in performance across administrations for the majority of participants' subtest scores. Only one participant showed a significant change in performance, which was a decline in performance from pre-intervention data. Nonetheless, this participant's post-intervention score was considered within the average range when compared with scores of boys of the same age. In general, results tended to vary across participants, yet performances also appeared highly correlated with each participant's level of intelligence. For example, participants with average levels of intelligence tended to perform within the average to above average ranges across administrations, and those participants with co-occurring intellectual disabilities performed within the lower extreme to below average ranges. Taken together, participation in the CCAL intervention did not appear to significantly improve participants' executive function skills in the areas of attentional control, cognitive switching, sustained attention, or response inhibition.<sup>4</sup>

Results from Sally's performance on the TEA-Ch showed high average to above average performances on the Creature Counting and Walk, Don't Walk subtests, respectively, across administrations. Her ability to complete the Creature Counting subtest in a timely manner was also within the expected range for her age. Average performance was demonstrated on the Opposite Worlds subtest at pre- and post-

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<sup>4</sup> The Creature Counting and Opposite Worlds subtests measured attentional control and cognitive switching. The Walk, Don't Walk subtest measured sustained attention and response inhibition skills.

intervention phases. Increases in scaled scores were observed on the Same World and Opposite World conditions, yet neither of these scores was considered statistically different from pre-intervention results.

Sam's performance on the Creature Counting subtest fell within the above average range across administrations. As mentioned previously, a significant decline in performance was observed on the Walk, Don't Walk subtest because Sam's performance decreased from the above average to average ranges across pre- and post-intervention data collection phases, respectively. Results from the Opposite Worlds subtest revealed average performances across conditions, yet Sam was noted using slightly more time to complete the Same World condition and slightly less time on the Opposite World condition during the second test administrations.

John was unable to complete any of the items on the Creature Counting subtest correctly during pre- or post-intervention phases. Thus, Timing scores could not be calculated and his overall scores were described within the lower extreme range. John demonstrated improved performance on the Walk, Don't Walk subtest. At the start of the intervention, John's score fell within the lower extreme range and increased to the below average range at the conclusion of the study. Performances within the lower extreme range were also observed on both conditions of the Opposite Worlds subtest because John tended to take an extended period of time to complete these tasks.

Matthew performed within the below average ranges across administrations of the Creature Counting subtest, although a slight decrease in performance, as noted in the number of correct responses, was observed during the second test administration. Matthew required an extended period of time to complete this task, which resulted in a

lower extreme score at the pre-intervention phase and an inability to calculate a score at the conclusion of the study. Increased performance was observed on the Walk, Don't Walk subtest across administrations, yet Matthew's performance continued to fall within the lower extreme range. Finally, Matthew's performance on both conditions of the Opposite Worlds subtest fell within the lower extreme range. He completed the Opposite Worlds condition slightly faster during the post-intervention phase, which resulted in a higher scaled score.

### **Limitations of the Current Study**

There is some possibility that using the same measures at pre- and post-intervention phases may have impacted the outcomes because of test familiarity (Kazdin, 2003). In addition, there may have been some instances in which participants seemed to be responding quickly to self-report measures in an effort to avoid fatigue and/or boredom. Possible problems with response shift may have also limited findings from this study, in that, the participants and/or their parents reported fewer problems than at the start of the study due to changes in perspective regarding initial anxiety symptoms (Kazdin, 2003). It is also plausible that intervention outcomes were impacted by participants' and parents' awareness of being in a study and/or were influenced by attention and frequent contact from the researcher. Thus, participants and their parents may have behaved or responded differently (e.g., more positive responses, higher expectations) from their responses during normal life circumstances.

This study utilized a small sample ( $n = 4$ ) composed of minority adolescents, aged 11 to 15 years. Additionally, each participant was diagnosed with ASD, evidenced anxiety symptoms, and varied in levels of intelligence. Therefore, results from this study

are not generalizable to larger, more diverse samples that are representative of the current U.S. population. Moreover, results may have been impacted by subject heterogeneity. It is difficult to determine the extent to which each of these previously mentioned factors might have influenced treatment outcomes without use of a control group.

The timing in which this study occurred and in which data were collected may have posed a potential threat to external validity. Participants began the study over the summer months and concluded their participation during the fall of 2014. For many of the participants, school-related activities and social interaction opportunities with peers were considered highly problematic and led to increased anxiety symptoms. Thus, starting the study during a period of time in which these events and situations were less likely to occur may have impacted pre-intervention results. Furthermore, ending the study during a timeframe during which these events were extremely more likely to occur may have also confounded findings. Nonetheless, the fact that each participant's parent reported elevated levels of anxiety during the summer months provides evidence that their child's level of anxiety was seen as problematic. In addition, anxiety symptoms may have worsened at the start of the school year without support from the CCAL intervention.

Every effort was made to standardize intervention procedures by means of the development of a scripted and detailed protocol for each session. However, there were instances in which unexpected interactions arose; these could not be planned for in advance and required the knowledge and skill of the researcher to address appropriately in the moment. Having the researcher serve as the sole therapist implementing the CCAL intervention potentially served as a source of bias in the study. Using a "blind"

researcher that was unaware of the purpose, research questions, and hypotheses of the study may have minimized bias as well as potential experimenter expectancy effects.

Last, there are some potential limitations with the measures selected and the methods in which data were collected in this study. For instance, the SCAS and the TEA-Ch were normed on Australian youth, which limits their generalizability to children in the U.S., including the four adolescents that participated in this study. Although the SCAS utilized a larger sample for standardization purposes, the TEA-Ch was normed on a small sample of 293 children. It is important to note, however, that the current study's sample was composed of a group of individuals with disabilities, which may not have been fully represented in the normative samples for the SCAS or TEA-Ch. Raw scores obtained from the SCAS: Parent Version could not be transformed into standardized scores and no normative information from the SSS was available at the time of this study. Additionally, self-report techniques may have limited the results of this study because individuals with ASD tend to have difficulties reflecting on their own thoughts about particular situations (Hill, Berthoz, & Frith, 2004). Thus, many, if not all, of these factors may have impacted the results and outcomes of this study. However, it is unclear whether or not the measures selected as part of this study were sensitive enough to measure change effectively over time. Using a combination of quantitative and qualitative techniques may have provided greater understanding regarding the level of effectiveness of the CCAL intervention.

### **Future Research**

Despite these limitations, it will be important to replicate this study using a larger, more diverse sample of participants. Two of the four participants exhibited average



levels of intelligence, but the other two participants met criteria for a comorbid intellectual disability. It was unclear whether or not levels of intelligence impacted treatment outcomes, in terms of decreasing anxiety symptoms, due to variable findings. In the future, it will be important to control for these variables when interpreting results and determining treatment outcomes. Use of a wait-list control group and randomized selection of participants is strongly recommended to investigate further, the effectiveness of the CCAL intervention. Additionally, the use of a combination of quantitative and qualitative measures may provide more information regarding the effectiveness of the CCAL intervention, as well as support participants' individualized, personal changes over time.

### **Summary and Conclusions**

Autism Spectrum Disorder is a complex and multifaceted, neurodevelopmental disorder that severely impacts children and families across a variety of settings. Prevalence rates of ASD are continuing to increase rapidly, with large costs placed on families and society when implementing interventions and treatments. Despite treatment efforts, very few children with ASD grow to be adults that are gainfully employed and live independently. Further complicating the matter, many individuals with ASD also evidence co-occurring anxiety symptoms or disorders and tend to be at a higher risk for developing such problems, when compared with other clinical populations or typically developing children. The causes for this clinical profile remain inconclusive, but it is clear that there is a significant need for effective treatments and interventions for this population.

This study investigated the effectiveness of the computer-assisted CBT program, Camp Cope-A-Lot, in regard to reducing anxiety symptoms in youth diagnosed with ASD. In treating associated symptoms (e.g., anxiety), research has shown that effective treatments may also reduce the overall presentation and level of severity of ASD symptoms. Finally, it was hypothesized that improvements in executive function skills would be observed due to the cognitive aspects of the intervention.

Four participants aged 11 to 15 years, who were diagnosed with ASD, were included in this preliminary study. Results suggested that the 12-week intervention was generally successful in decreasing some symptoms of anxiety for each of the participants. However, results were inconsistent across scales, subscales, and participants. Similar findings were revealed when measuring symptoms of ASD on the ASRS, in terms of variability observed across scales, subscales, and analyses between and within participants' report profiles. No statistically significant changes in performance were observed on the ASRS Total Score, DSM-5 Scale, or any of the subscale scores, yet results were suggestive of some reduced symptomology, as denoted by decreases in *T*-scores following completion of the CCAL intervention. Last, data collected via direct testing using the TEA-Ch did not reveal statistically significant changes in performance across administrations on the majority of participants' subtest scores. Results tended to vary across participants, yet performances also appeared highly correlated with each participant's level of intelligence. Taken together, participation in the CCAL intervention did not appear to significantly improve participants' executive function skills in the areas of attentional control, cognitive switching, sustained attention, or response inhibition.

While conducting this study, it did not appear that all treatment outcomes could be captured via quantitative methodology. As mentioned previously, future research may focus on utilizing a combination of quantitative and qualitative data collection techniques in an effort to better evaluate treatment outcomes. Although not used as a formal evaluation method, parents were asked to complete an Informal Research Feedback Form in order to learn more about their experiences of participating in the study. In general, parents agreed that the CCAL intervention appeared to reduce their child's difficulties with anxiety. Additionally, there was strong agreement across parents that the program was easy to implement and that their child seemed willing and eager to participate in the weekly intervention. Few barriers to participation were reported; these included conflicts with family schedules and being available for weekly sessions. Some participants and their families experienced more challenges applying learned information to real life situations on a regular basis, but others felt that the skills and strategies were easily generalized to the home environment. Families that had more difficulties implementing strategies recommended having the researcher complete one or two visits in the natural environment to provide additional support.

This feedback is valuable to the current study and provides implications for future research and implementation of the CCAL program. The ease of implementation and the motivation to participate appears promising in the delivery of mental health services for this population. Utilizing a computer appeared especially effective because many participants interacted with the CCAL characters. For instance, on several occasions participants were observed talking at the screen, answering questions, and providing comments in a variety of situations. Furthermore, the participants seemed to find the

main character, Charlie, very relatable because many could identify with his fears and worries. Participants assisted Charlie with facing his fears (e.g., problem-solving through particular situations) and in turn, appeared more confident in attempting to complete graded exposure tasks in an effort to "...be brave like Charlie."

Use of technology also appeared to increase participants' comfort levels, when compared with traditional face-to-face, talk therapies. Increased anxiety was noted during the last six sessions in which the information provided by the computer program was lessened. Although participants were working on exposure tasks during these sessions, many participants commented that the first six sessions were "more fun." Several participants inquired about how much talking they would have to do, and another participant asked if she could start the CCAL intervention over because the first part was more interesting. Not only did participants appear more comfortable with the computer-assisted therapy, but participants also seemed better able to retain and recall information presented in this format. Providing visual information in a concrete and consistent manner appeared effective for this population's learning style. Many of these techniques are used in educational settings in an effort to differentiate instruction and support learning, and may also prove to be a viable accommodation in the delivery of traditional CBT.

Further accommodations may be warranted for children with ASD and accompanying intellectual disabilities. During the current study, the researcher sometimes needed to provide John and Matthew with additional structure and support when developing their FEAR plans due to difficulties generating ideas independently. As an example, both John and Matthew benefited from having the researcher provide

choices of “Attitudes and Actions” that could help in situations such as engaging in relaxation or creating positive thoughts in an effort to reframe thought distortions. These findings appeared consistent with previous research that described adaptations used when delivering CBT to treat anxiety in children with ASD (Anderson & Morris, 2006; Chalfant et al., 2007; Reaven et al., 2009; Sofronoff et al., 2005; Sze & Wood, 2007).

From a practical standpoint, the use of a computer-assisted program appeared less time-consuming to the therapist, which may alleviate some of the pressures of large caseloads observed in educational and clinical settings. The therapist could potentially have the option of implementing the CCAL intervention with several children at one time by having the program available on multiple computers. Because the children are also being exposed to the same, standardized information during the first six sessions and introductions of the remaining sessions, this could also allow the therapist to implement small group versus individual treatment sessions. Children may find comfort working in a small group by identifying with others’ fears and worries. Group counseling also offers the opportunity for encouragement and problem solving with others, which may promote a sense of belonging. This may be especially important for children with ASD because they may be subject to greater social isolation and rejection from their peers.

Checkpoints and coach check-ins are provided throughout sessions, allowing the therapist to provide feedback to participants and answer any individual questions. The CCAL program also collects information regarding each participant’s Totem Pole Challenges and when and how long it took participants to complete sessions. The cost of the program was relatively inexpensive when compared with other traditional mental

health services; this can be appealing to many school and clinical systems dealing with decreasing annual budgets.

When asked about some of the most rewarding aspects of participating in the study, parents reported that they enjoyed working with a psychologist on a weekly basis and that they were pleased that there was an available program that fit the needs for their child's specific population. Many parents discussed the lack of mental health services in general for youth diagnosed with ASD, with even fewer known supports for individuals experiencing moderate-to-severe symptoms of anxiety. In addition to program satisfaction, parents observed positive differences in their children. Some parents reported that they enjoyed watching their children implement learned skills to cope with their fears and anxieties. One parent was pleased with her child's decreased physiological symptoms of anxiety; she reported that she was no longer receiving phone calls from the school nurse regarding her child's frequent stomachaches. Other parents noted that it was rewarding to watch their children set and "conquer" their goals. Treatment sessions were often scheduled consecutively, so that many participants had an opportunity to meet one another and build new friendships. Several parents exchanged phone numbers in order to plan activities separate from their participation in the study. One family also seemed to experience a sense of community because it was recommended that a "Camp Cope-A-Lot Reunion" be conducted in an effort to keep in touch with the other children and their families.

Consistent with previous research (Sofronoff et al., 2005), parent involvement in the CCAL intervention appeared essential to each participant's success in the program. Parents were taught CCAL vocabulary that was used among the child, researcher, and

parent to easily facilitate communication regarding learned skills and coping strategies (e.g., “false alarm versus real danger”). Thus, this common language allowed parents to serve as effective “coaches” in real-world settings, because parents were able to cue and prompt their child to use learned strategies in appropriate situations. For instance, when one parent asked her child if he was caught in a “thinking trap,” the child was quickly able to activate his FEAR plan and to determine an “Attitude and Action” that could help, through the use of cognitive restructuring. The parent’s ability to prompt and cue their child when faced with a stressful situation was not only key to successfully navigating this one event, but it also allows an opportunity for parents to teach their child how to generalize learned skills across settings. This is especially important for children with ASD, because this executive skill is often impaired in this population. However, this information also provides parents with knowledge and another skill set to further support their child in the social world, which often proves endlessly challenging for children with ASD.

These findings have educational and occupational implications because educators and employers can serve as effective “coaches” as well. Many studies discuss the importance of education in terms of disability awareness and making environments more conducive to a variety of learning styles (Barnhill, 2007; Hendricks, 2010; Howlin et al., 2004). By providing a common language, understanding, and skill set (e.g., cueing the individual to use learned skills) similar to that demonstrated by participants’ parents, there might be better outcomes for individuals with ASD across a variety of settings.

The researcher informally documented successes accomplished by the participants during weekly sessions. These findings were suggestive of changes in participants’

quality of life in many respects, which often can go undetected when measured using solely quantitative measures. Over the course of this study, participants were able to face many of their fears such as the following: approaching, playing and having conversations with same-aged peers, taking tests, ordering meals independently in restaurants, tolerating crowded situations, and allowing personal objects to be misplaced or rearranged. Several participants were able to cope when separated from their parents (including parent vacation or staying the night away from home) and when dealing with worried feelings regarding a variety of events (e.g., being in the dark, death of a loved one, fear of storms and other natural disasters). In addition, the majority of participants were advancing to a new level of schooling (e.g., middle school to high school) and/or attending a new school, which were considered highly anxiety-provoking situations. Regardless of these challenges, several participants became more confident in their skills over the course of the intervention and attempted to get more involved with school-related activities.

In comparison with other participants in this study, Sally appeared to enjoy her time with the researcher better than most; she seemed to look forward to the positive, individualized attention she received during weekly sessions. For example, when asked about some of her favorite parts of the CCAL intervention, Sally shared, “I told you stories and you listened.” Thus, the therapeutic relationship did not appear negatively influenced by the use of a computer. In fact, there were several instances in which information observed on the computer served as a conversational starter during sessions. Sally disclosed many stressors related to familial situations and wished that she would receive more attention and praise from her parents. During the seventh session, Sally



expressed a desire to share her thoughts and feelings with her parents about these concerns as one of her exposure tasks.

Overall, Sally accomplished many tasks while participating in this study. She conquered some of her fears of heights by means of visual imagery and practice tasks that included riding on elevators. Sally learned relaxation easily and even taught her mother how to engage in this technique when she was feeling stressed. In addition, in school she made new friends that shared similar interests and even hosted a social party at her house. During session five, Sally's mother shared that her daughter was expressing her feelings more effectively, especially when anxious. For instance, when meeting her new school staff, Sally's mother shared that her daughter would have typically shrugged and said, "I don't know" in response to questions. While in this study, her mother observed her daughter taking a deep breath and verbalizing, "I feel nervous," which was described as a significant change in her behavior. Sally enjoyed drawing during her sessions and created illustrations of thinking traps and stressful situations. She also used drawings to create effective solutions to problems. These strategies may serve as effective accommodations in expressing thoughts and ideas for other children with ASD as well.

Taken together, Sally showed tremendous growth and progress, but one of her greatest accomplishments occurred during the final weeks of her participation in the study. It was noted that Sally was initially fearful of speaking and of potentially embarrassing herself in front of others. However, near the conclusion of the study Sally auditioned for her school's play and was given a fairly major role. She was able to practice her audition during sessions and generated an effective FEAR plan to use at the

actual audition, which Sally commented worked “very well.” Once in the play the researcher was able to coach her through other obstacles she encountered.

When working individually with Sam, he related extremely well to the main character, Charlie, as well as many other characters that were part of the CCAL program. Sam frequently commented about the actions of characters with phrases such as, “He’s confident” and “He’s being brave.” He was able to identify many similarities between him and the characters in the program, which served as conversation starters during sessions. Sam reflected on situations he was observing by making comments such as, “I’m afraid of camp, bugs, and the dark too. I was afraid the first time I went to camp.”

Sam exhibited an excellent memory for information presented visually on the computer and in his Go-to-Gadget (GTG). He often retrieved and followed along in his GTG when referenced at the end of several sessions on the computer. Due to his advanced memory skills, Sam was able to recall activities and vocabulary easily, and remember strategies used across sessions to help in present situations and exposure-based tasks. This skill also assisted in his ability to quickly identify “thinking traps” and generate appropriate coping thoughts for the given situation. However, Sam was not always able to generalize these skills outside of intervention sessions and tended to benefit from prompts and cues from his parents.

Sam learned to identify feelings in others adequately and could explain the reasoning for his responses to questions (e.g., “He’s disappointed because he is frowning and looks sad”). He recognized physiological symptoms of anxiety that he experienced regularly and practiced behavioral strategies such as deep breathing and relaxation with

the computer program and outside of sessions. Unlike Sally, Sam did not enjoy the “talking parts” of sessions as much as the computer-based components.

Sam was able to develop a FEAR plan for a variety of situations with limited practice or assistance from the researcher. This enabled Sam to move quickly through his Totem Pole Challenges or attempt more challenging tasks earlier in the intervention. In addition, he was often observed reorganizing or removing some of his exposure tasks; he reported that he was “...no longer worried about those anymore.” One of his most significant challenges was being assertive with peers that teased him; for this, he created the following FEAR plan: F: “Feeling angry, fists balled up,” E: “It’s just going to get worse,” (which he identified as catastrophizing), A: “I can tell the adult or step outside to catch my breath. I could think that not everyone can be my friend,” and R: “I will be proud of myself and have a great school year.” Over the course of this study, Sam made many friends and built social relationships with others by participating in his new school’s marching band.

John was cooperative throughout intervention sessions and showed increased levels of attention when information was presented on the computer. He used limited verbal output during the initial sessions, yet became more comfortable and talkative as the intervention continued. It was unclear whether he understood all of the content presented at each session; however, John was able to respond to activities and accurately answer review questions as part of CCAL Contests. Information sometimes needed to be reread or repeated to John in order to accommodate his needs. It was important to provide John with supervision during sessions because he often attempted to click quickly through Checkpoints or fast-forward to the end of the content information. He

also required reminders to slow down and listen carefully to the computer. It was noted that John frequently became extremely active, playful, or off-task during the talking portions of several sessions.

John appeared to benefit from the use of consistent routines. For instance, he knew that he was to use the computer, talk with the researcher for a period of time, and then engage in Game Time. He showed inflexibility for this routine if additional information was to be added, requiring additional prompting and reassurance. John was also hesitant to engage in relaxation demonstrations with the computer videos, but was observed practicing with the researcher, with prompting and encouragement. John demonstrated difficulties spontaneously generating ideas and often needed the researcher to provide choices in an effort to create his FEAR plans (e.g., “Would you think...or...?”).

Matthew required accommodations and modifications during sessions, similar to those used with John because he also demonstrated difficulties generating thoughts and ideas independently. Strategies included providing choices, visuals, and concrete examples of information. For instance, during one of his exposure tasks, Matthew was provided with a picture menu in order to assist him with ordering his own meal in a restaurant. He was also provided with examples and choices when completing problem-solving tasks. The use of the CCAL computer program provided many opportunities for concrete, consistent, and visual types of instruction. Matthew appeared to enjoy using the computer during interactive activities, especially when practicing relaxation and deep breathing techniques. He was easily able to imitate the actions shown on the computer and often revisited the relaxation videos to rehearse during subsequent sessions. When

learning relaxation, it was noted that the video demonstrations provided concrete examples, such as pretending to squeeze a lemon in a person's hands when tightening fists; Matthew appeared to respond to this favorably. Similar to John, Matthew also required adult supervision during sessions because he sometimes wanted to rewind or skip ahead in the computer session. He also was provided with prompting and redirection when he appeared inattentive or seemed unfocused on the computer screen.

Very limited verbal production was observed initially; it consisted of one-word utterances or "yes/no" responses. Matthew was also speaking very quietly, making it difficult to comprehend what he was communicating at times. However, as the intervention continued, Matthew became more comfortable and began speaking in short phrases and sentences. Although at a basic level, Matthew was able to link his thoughts successfully with his feelings. As an example, he was able to discuss a pleasant situation in which his cousins visited, he thought, "I love them," which correlated with his feelings of happiness. When provided with illustrations of situations that entailed a variety of characters and "thought bubbles," each participant was able to comprehend easily the link between thoughts and feelings. Because of this population's concrete thinking style, some participants became visibly upset with a thought that was placed in the thinking bubble that was not consistent with the character's feelings.

Matthew's mother was extremely supportive when implementing strategies both at home and in the community. In fact, when away on a family vacation she made sure to bring Matthew's GTG, in order to help remind him of strategies to use when needed. Matthew's mother diligently practiced strategies and techniques with her son. For instance, when Matthew was upset she often reminded him to practice his breathing and

relaxation. Matthew reportedly followed his mother's advice and quickly was able to recover from setbacks (e.g., appeared calm and smiling). She shared that she was learning how to problem-solve and stay calm, which in turn, helped her know how to help Matthew better. His mother also noted that she was learning through practice how to modify strategies because of her son's cognitive limitations. In realizing how challenging some of Matthew's practice tasks were, his mother also frequently supplied tangible reinforcement such as small toys as rewards for his efforts.

Some of Matthew's exposure tasks included ordering food independently in restaurants, having friends over to his house, and tolerating crowded situations. In each of these situations, Matthew was reported using his voice appropriately as well as sharing his feelings about these events (e.g., "I want to play some more," "I don't want to leave"). Matthew developed a close friendship with Sam, which led to further practice with social interaction and relationship skills. Matthew was also able to separate from his parents more easily, take tests, as well as tolerate the sound of babies crying throughout subsequent sessions. Behavioral strategies such as using relaxation and deep breathing while in these situations tended to be the most effective techniques for Matthew, when compared with cognitive-based strategies.

At the end of each session, participants were asked to share something they enjoyed, learned, and would change in future sessions. Minimal information was reported when asked about desired changes to sessions or to the CCAL program. Some participants said that the characters sometimes, "talked too long," and others wished for more time at the end of sessions to play games. In contrast, several of the participants noted that they enjoyed using the computer and in engaging in Game Time activities and

CCAL Contests. Characters from the CCAL intervention, specifically Charlie, were also described in a positive manner. The participants described the fact that they enjoyed helping Charlie in a variety of ways (e.g., going to camp, solving problems, and winning contests). Sam noted that he felt more confident when he was, “facing [his] fears with Charlie.” He also shared that he enjoyed, “...taking deep breaths and relaxing” with assistance from camp characters. Sally specifically pointed out that she enjoyed drawing pictures and being able to talk about her, “past fears.” Use of the computer program also showed that despite their disabilities, participants were able to empathize and understand the perspective of the camp characters. For instance, participants described the reason why people become nervous at a talent show and carnival after watching the videos during these sessions. In addition, participants were able to compare their thoughts in these situations with those depicted by characters on the computer program.

Each of the participants described many things that they learned in using the CCAL intervention, yet some of the most profound findings included the participants’ abilities to normalize feelings of anxiety. Throughout the course of the intervention, participants shared that they learned, “It’s okay to be scared” or “It’s okay to be nervous.” From this style of thinking came more confidence and willingness to learn strategies to cope with fears and challenging situations (e.g., “I want to be brave”). One participant noted, “I need coping thoughts to survive this world,” and another participant shared that “...relaxation is the best way to feel calm.” Each participant appeared more confident and willing to attempt exposure tasks after completion of only one or two of their lowest anxiety-provoking situations listed on their individual Totem Poles. Furthermore, situations that were once described within the high anxiety range seemed

more manageable and were perceived as less stressful by participants after practicing in and outside of intervention sessions. Participants were empowered by their ability to identify cognitive distortions in others (e.g., “He’s being a perfectionist”) as well as to assist with reframing thoughts in order to be more helpful in situations. Sam shared that in learning and practicing strategies taught with the CCAL program, he could “conquer [his] fear regularly.”

Many of these findings were not evident via quantitative data analysis. Thus, it is important from a therapeutic perspective to incorporate qualitative information, progress notes, and observations into future research efforts. Qualitative measures may provide a more accurate estimate of growth over time versus the sole point in which data are collected via quantitative methods. Measuring progress by means of quantitative measures with children who have ASD appears especially challenging, because data may fluctuate more rapidly due to a recent event or experience. For instance, one participant reported a significant fear of snakes after watching a movie that was not described at any other point in the study. These behaviors are not uncommon in children with ASD because they can often become easily fixated or preoccupied with a variety of thoughts, topics, or ideas.

In conclusion, results from this study offered preliminary evidence for the use of the CCAL program in treating anxiety symptoms in children with ASD. Data from quantitative measures revealed inconsistent results, yet qualitative feedback from participants’ parents as well as information from the researcher’s observations and progress notes seemed more promising. Continued research into this and other effective



treatments is warranted, especially if there is to be improved, longer-term outcomes for this complex, rapidly growing population of children.

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**Appendix A: Basic Computer Skills Checklist**

**Participant ID:** \_\_\_\_\_

<b>Criteria</b>	<b>Requirement Met</b>	<b>Notes</b>
Power the computer on and off.	Yes No	
Log on and off of the computer.	Yes No	
Identifies parts of a computer: 1] Monitor 2] Mouse 3] Keyboard 4] CD/DVD drive 5] Headphones 6] Microphone 7] Speakers	Criteria Met = 5/7  Yes No	
Uses an input device (e.g., mouse) in order to: 1] Point 2] Select/click 3] Double click 4] Click/select and hold 5] Drag and drop	Criteria Met = 3/5  Yes No	
Moves the cursor (e.g., using arrow keys and/or mouse).	Yes No	
Types/enters letters and numbers.	Yes No	
Uses/adjusts volume controls.	Yes No	

Level of accuracy = \_\_\_\_ / 7 = \_\_\_\_%

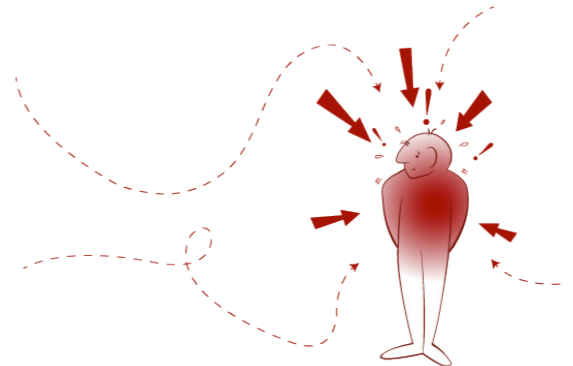
Passing score = 80%

Requirement Met – Yes/No

**Appendix B: Recruitment Flyer**



**DOES YOUR CHILD HAVE AUTISM AND SHOW INCREASED  
LEVELS OF ANXIETY AND WORRY?**



PARTICIPATE IN A RESEARCH  
STUDY TO HELP REDUCE YOUR  
CHILD'S ANXIETY!

We are seeking children aged 11 to 15 years to participate in a 12-  
week, computer-assisted intervention study.

Participation will take place at

The One World Center for Autism, Inc., starting in April 2014

For more information, please contact:

**The Childhood Autism & Anxiety Study**

Jennifer Zabel, Responsible Investigator

[jenniferza@pcom.edu](mailto:jenniferza@pcom.edu)

(301) 618-8395

*"Linking those living with autism to their world"*  
[www.worldforautism.info](http://www.worldforautism.info)

1400 Nalley Terrace, Hyattsville, MD 20785



**The One World Center  
for Autism, Inc.**

**Appendix C: Intake Procedure Protocol**

Participant ID: \_\_\_\_\_

Steps	Completed
<ul style="list-style-type: none"> <li>Following the recruitment period, parents and potential participants are invited to the One World Center for Autism, Inc.</li> </ul>	
<ul style="list-style-type: none"> <li>Parents are provided with more detailed information about the study via the Informed Consent Form for Participation.</li> </ul>	
<ul style="list-style-type: none"> <li>Parents are given ample time to read the Informed Consent Form for Participation.</li> </ul>	
<ul style="list-style-type: none"> <li>Parents are given ample time to ask questions regarding the Informed Consent Form for Participation.</li> </ul>	
<ul style="list-style-type: none"> <li>Parents voluntarily consent in writing for participation in the study or decline. If the parent decides to decline participating, intake procedures are discontinued.</li> </ul>	Consent form signed: <input type="checkbox"/> Yes <input type="checkbox"/> No  Discontinue intake: <input type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> <li>Potential participants are provided with more detailed information about the study via the Informed Assent Form for Participation.</li> </ul>	
<ul style="list-style-type: none"> <li>Potential participants are given ample time to read the Informed Assent Form for Participation.</li> </ul>	
<ul style="list-style-type: none"> <li>Potential participants are given ample time to ask questions regarding the Informed Assent Form for Participation.</li> </ul>	
<ul style="list-style-type: none"> <li>Potential participants voluntarily assent in writing for participation in the study or they decline. If the potential participant decides to decline participation, intake procedures are discontinued.</li> </ul>	Assent form signed: <input type="checkbox"/> Yes <input type="checkbox"/> No  Discontinue intake: <input type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> <li>Parents and potential participants complete the Inclusionary Criteria Checklist, which includes:                             <ul style="list-style-type: none"> <li>Reviewing child’s date of birth and proof of a diagnosis of Autism Spectrum Disorder.</li> <li>Completing the parent’s report of the Spence Children’s Anxiety Scale (SCAS).</li> </ul> </li> </ul>	

<ul style="list-style-type: none"> <li>• Potential child participants completing several skills on a provided computer in order to measure level of proficiency, as outlined on the Basic Computer Skills Checklist.</li> </ul>	
<ul style="list-style-type: none"> <li>• The researcher provides information to the parent and potential participant regarding whether the participant meets criteria for inclusion in the study. If the participant does not qualify (e.g., does not meet inclusionary criteria), the parent and participant are thanked for their time and intake procedures are discontinued.</li> </ul>	<p>Inclusionary criteria met: Yes No</p> <p>Discontinue intake: Yes No</p>
<ul style="list-style-type: none"> <li>• Contact information is collected via the Contact Information Form.</li> </ul>	
<ul style="list-style-type: none"> <li>• Demographic information is collected via the Demographic Information Form.</li> </ul>	
<ul style="list-style-type: none"> <li>• Test results with verbal and overall cognitive ability scores are reviewed as part of participant demographic information.</li> </ul>	
<ul style="list-style-type: none"> <li>• Pre-test data is collected, which includes:                             <ul style="list-style-type: none"> <li>○ Administration of the Stress Survey Schedule for Individuals with Autism and Other Pervasive Developmental Disabilities (SSS) – Child Report.</li> <li>○ Administration of the Spence Children’s Anxiety Scale (SCAS) – Child Report.</li> <li>○ Administration of the Autism Spectrum Rating Scale (ASRS) – Parent Report.</li> <li>○ Administration of the following Version A subtests to child participant from the Test of Everyday Attention for Children (TEA-Ch):                                     <ul style="list-style-type: none"> <li>▪ 1] Creature Count</li> <li>▪ 2] Opposite Worlds</li> <li>▪ 3] Walk, Don’t Walk</li> </ul> </li> </ul> </li> </ul>	
<ul style="list-style-type: none"> <li>• A date to begin the intervention (within one week of completing intake procedures) will be determined with the parent, prior to being dismissed from the One World Center for Autism, Inc.</li> </ul>	

**Appendix D: Inclusionary Criteria Checklist**

Participant ID: \_\_\_\_\_

<b>Criteria</b>	<b>Criteria Met</b>	<b>Notes</b>
The participant is between the ages of 11 years, 0 months and 15 years, 11 months.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
The participant's primary language is English.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
The participant is available to complete weekly lessons on the computer over the course of a 12-week time period. This includes approximately 50-60 minutes per week during the first 6 sessions and approximately 65 minutes per week during the remaining 6 sessions.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Transportation to the One World Center for Autism is available each week for the 12-week intervention.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
The participant has been diagnosed with Autism Spectrum Disorder (ASD).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Written documentation of the presence of ASD or a previous DSM-IV-TR diagnosis of Autistic Disorder, Asperger's Syndrome, or PDD-NOS from a qualified professional is provided.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Written documentation of disability is no more than 2 years, 11 months old.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
The individual is taking medication to treat problems with anxiety.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
The individual experiences significant seizures or other medical conditions that may interfere with their participation in the study.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
The participant is experiencing elevated levels of anxiety as	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

evidenced by a Total Score $\geq 30$ for males or a Total Score $\geq 32$ for females on the parent's report on the Spence Children's Anxiety Scale (SCAS: Parent Version).		
The participant demonstrates at least 80% accuracy on the basic computer skills checklist.	Yes No	

Number of criteria met = \_\_\_\_/11 = \_\_\_\_%

Passing score = 100%

Requirement met – Yes/No

**Appendix E: Contact Information Form**

Date: \_\_\_\_\_

Participant ID: \_\_\_\_\_

*Participant Information*

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_

Male: \_\_\_\_\_ Female: \_\_\_\_\_ DOB: \_\_\_\_\_ Age: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State, Zip Code: \_\_\_\_\_

*Parent/Legal Guardian Information*

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_

Address (if different): \_\_\_\_\_

City: \_\_\_\_\_ State, Zip Code: \_\_\_\_\_

Home Phone: \_\_\_\_\_ Cell Phone: \_\_\_\_\_

Work Phone: \_\_\_\_\_ Preferred Phone Contact: \_\_\_\_\_

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_

Address (if different): \_\_\_\_\_

City: \_\_\_\_\_ State, Zip Code: \_\_\_\_\_

Home Phone: \_\_\_\_\_ Cell Phone: \_\_\_\_\_

Work Phone: \_\_\_\_\_ Preferred Phone Contact: \_\_\_\_\_

### Appendix F: Parental Demographic Information Form

Your responses are completely voluntary. Please only answer the questions below that you prefer to answer.

Age of Child: \_\_\_\_\_

Sex: Male/Female

Grade-Level: \_\_\_\_\_

Race/Ethnicity of Child:

- White
- Hispanic or Latino
- Black or African American
- Native American or American Indian
- Asian / Pacific Islander
- Other

What is the highest degree or level of school you have completed? *If currently enrolled, highest degree received.*

- No schooling completed
- Nursery school to 8th grade
- Some high school, no diploma
- High school graduate, diploma or the equivalent (for example: GED)
- Some college credit, no degree
- Trade/technical/vocational training
- Associate degree
- Bachelor's degree
- Master's degree
- Professional degree
- Doctorate degree

Type of Residency:

- Apartment/Townhouse
- Single Home
- Shared Housing

Number of miles traveled round trip to One World Center for Autism: \_\_\_\_\_

County of Residency: \_\_\_\_\_



Type of Residency:

- Suburban
- Urban
- Rural

Marital status:

- Single, never married
- Married or domestic partnership
- Widowed
- Divorced
- Separated

Employment status:

- Employed for wages
- Self-employed
- Out of work and looking for work
- Out of work but not currently looking for work
- A homemaker
- A student
- Military
- Retired
- Unable to work

Total household income:

- Less than \$15,000
- \$15,001 to \$30,000
- \$30,001 to \$45,000
- \$45,001 to \$60,000
- \$60,001 to \$85,000
- \$85,001 to \$100,000
- Above \$100,000

Age of child when initially diagnosed with Autism Spectrum Disorder: \_\_\_\_\_

Number of years your child has been receiving therapy or intervention: \_\_\_\_\_

Number of years receiving any of the following therapies:

- Counseling or other mental health support \_\_\_\_\_
- Social skills training \_\_\_\_\_

Number of years your child has been receiving special education services or supports (e.g., IEP or Section 504 Plan): \_\_\_\_\_

**Appendix G: Session Objectives & Procedures Protocol**

Participant ID Number: \_\_\_\_\_

Level 1: “To Camp Cope-A-Lot”

*Objectives*

- The child is introduced to the character, “Charlie” and the other campers.
- Interactive activity: Help Charlie pack for camp.
- The child is welcomed and takes a tour of Camp Cope-A-Lot.
- The child is introduced to Camp Cope-A-Lot Contests and to the Go-To-Gadget (GTG) practice activities.
- The child completes the first, GTG practice task (pp. 5-6): Think of a time when you felt happy. Write what the situation was, what you were thinking, and how you were feeling.
- The child participates in Game Time: The child gets to play videogames for 10 minutes at the end of the session.

Steps	Completed
<ul style="list-style-type: none"> <li>• Orient the participant to the program:</li> </ul> <p><i>“Welcome to the Camp Cope-A-Lot Program. My name is Ms. Jen and I will be your coach for Camp Cope-A-Lot. We will be working with each other every week and you will be completing one level of Camp Cope-A-Lot each week. Your parents and I will be helping you at each level so that you can accomplish your goals. You will learn about your nervous feelings and thoughts, and how to use appropriate coping strategies.”</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 1: “To Camp Cope-A-Lot.”</li> </ul>	
<ul style="list-style-type: none"> <li>• Help the participant input name, background (e.g., gender, favorite food), and music preference.</li> </ul>	
<ul style="list-style-type: none"> <li>• Show the participant how to navigate within the program.                             <ul style="list-style-type: none"> <li>○ <b>Help:</b> <i>“Click ‘Help’ to pause the level and display the ‘Help’ pop-up. If clicked, you will be given the opportunity to ask me, your coach, for assistance.”</i></li> <li>○ <b>Rewind:</b> <i>“Click and hold down ‘Rewind’ to rewind the level. Release the button to stop rewinding the level.”</i></li> <li>○ <b>Play/Pause:</b> <i>“Click ‘Play/Pause’ once to pause the level. Click a second time to resume play.”</i></li> <li>○ <b>Forward:</b> <i>“Click and hold down ‘Forward’ to fast-forward through the level. Release the button to resume normal play.”</i></li> </ul> </li> </ul>	

<ul style="list-style-type: none"> <li>• Introduce four types of pop-ups that may be encountered during a level.</li> </ul> <p><i>“There are four types of pop-ups that you may see while completing a level. Two pop-ups, ‘Exit’ and ‘Help,’ are pop-ups you can initiate. The other two pop-ups, ‘Checkpoint’ and ‘Coach Check-In’ appear automatically at certain points in each level.”</i></p> <ul style="list-style-type: none"> <li>○ <b>Exit:</b> <i>“The ‘Exit’ pop-up appears when the ‘Exit’ button is clicked. You have two options – ‘Cancel’ or ‘Exit.’ Clicking ‘Cancel’ will close the pop-up and you will be able to continue to complete the level. Clicking ‘Exit’ will allow you to leave the level.”</i></li> <li>○ <b>Help:</b> <i>“As mentioned earlier, the ‘Help’ button can be pushed to pause at a level, so that you can ask your coach for help. When ready to continue with the level, you or I can click the ‘Continue’ button.”</i></li> <li>○ <b>Checkpoint:</b> <i>“The ‘Checkpoint’ pop-up appears after completing certain parts of the level. There are two options on the ‘Checkpoint’ pop-up – 1] You may click ‘Continue’ to proceed with the level or 2] click ‘Exit’ to leave the level and continue at a later time.”</i></li> <li>○ <b>Coach Check-In:</b> <i>“The ‘Coach’ pop-up appears at particular points during a level when you may need some help before continuing. You or I may click ‘Continue’ when ready to continue with the level.”</i></li> </ul>	
<ul style="list-style-type: none"> <li>• Have the participant attempt Level 1 independently and let him/her know where to find coach, if needed.</li> </ul> <p><i>“I would like for you to try Level 1 by yourself. You will meet our friend, Charlie, as well as other campers at Camp Cope-A-Lot. Charlie will tell us about some of his worries about going to camp. I will be sitting in the back of the room if you need help or have any questions. Are you ready? Let’s get started.”</i></p>	
<ul style="list-style-type: none"> <li>• Provide the participant with his/her Go-To-Gadget (GTG) and explain that he/she will need it for each level.</li> </ul> <p><i>“Here is your Go-To-Gadget. You will need to bring it with you to each session. Practice activities are provided in the Go-To-Gadget, which will help you remember what you have learned at Camp Cope-A-Lot and prepare you for Camp Cope-A-Lot Contests.”</i></p>	
<ul style="list-style-type: none"> <li>• Explain GTG activity for the week.</li> </ul> <p><i>“Take a moment to respond to your Go-To-Gadget activity here (point to p. 6). Write about a time you really enjoyed yourself.”</i></p>	

<p><i>Tell us about the situation; what you were thinking at the time, and how you felt. When it is time for the contest, you can use your Go-To-Gadget to help you remember what you practiced. That way you'll be sure to win some Game Time. The Level 2 contest will be about thoughts and feelings."</i></p>	
<ul style="list-style-type: none"> <li>• Introduce Camp Cope-A-Lot Contests:</li> </ul> <p><i>"At the beginning of Levels 2, 3, 4, 5, and 6 you will be helping Charlie complete different review activities, called Camp Cope-A-Lot Contests. The activities in your Go-To-Gadget will help you prepare for the upcoming Cope-A-Lot Contests. If you complete your Go-To-Gadget activities, you should be able to successfully complete the Cope-A-Lot Contests."</i></p>	
<ul style="list-style-type: none"> <li>• Explain Rewards/Game Time:</li> </ul> <p><i>"By completing the Go-To-Gadget activity and the Cope-A-Lot Contest, you will earn 10 minutes of videogame playing time at the end of each level. For participating in today's session, you have earned your first Game Time reward."</i></p>	
<ul style="list-style-type: none"> <li>• Provide participant with 10 minutes of Game Time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach enters password in order to exit level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach completes "Camper Performance Assessment," which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach confirms time and date of next session with participant and caregiver.</li> </ul>	

Level 2: “At the Carnival”

*Objectives*

- The child participates in first Cope-A-Lot Contest: “Feelings and Thoughts.”
- The child participates in an interactive activity, which focuses on identifying feelings and emotions.
- The child is introduced to somatic symptoms of anxiety.
- The child participates in an interactive activity in which the child identifies his/her own somatic symptoms.
- The child will learn that somatic symptoms can be false alarms and used as cues to ask, “Am I Feeling Frightened?” This is the first step in the 4-step, FEAR plan for coping with anxiety.
- The child completes the second, GTG practice task by writing about ways that he/she can tell if someone is excited, disappointed, anxious, or relaxed (p. 7).
- The child participates in Game Time. The child gets to play videogames for 10 minutes at the end of the session.

Steps	Completed
<ul style="list-style-type: none"> <li>• Welcome to Level 2 and rapport building with participant.</li> </ul> <p><i>“Welcome back to Camp Cope-A-Lot! Today, you will be going to a carnival with Charlie and the other campers. You will learn about thoughts and feelings and how our bodies give us clues that we are feeling scared or nervous. I hope you brought your Go-To-Gadget to help you with the Camp Cope-A-Lot Contest and our activity of the week. Remember that bringing your Go-To-Gadget each week will also help you earn fun Game Time. I will be sitting in the back of the room if you need help or have any questions. Are you ready? Let’s get started.”</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 2: “At the Carnival.”</li> </ul>	
<ul style="list-style-type: none"> <li>• The participant completes level 2 of Camp Cope-A-Lot relatively independently, asking questions at “Checkpoints” and “Coach Check-In” points as needed.</li> </ul>	
<ul style="list-style-type: none"> <li>• The participant learns about the upcoming Camp Cope-A-Lot Contest and completes the Go-To-Gadget activity with the coach.</li> </ul> <p><i>“In the Level 3 Camp Cope-A-Lot Contest, we’re going to ask you about different types of feelings. In the spaces provided here (point to p. 7), write ways you can tell by looking at someone if they are excited, disappointed, anxious, or relaxed.”</i></p>	
<ul style="list-style-type: none"> <li>• Provide participant with 10 minutes of Game Time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach enters password in order to exit level.</li> </ul>	

<ul style="list-style-type: none"><li>• Coach completes “Camper Performance Assessment,” which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.</li></ul>	
<ul style="list-style-type: none"><li>• Coach confirms time and date of next session with participant and caregiver.</li></ul>	

Level 3: “By the Waterfall”

*Objectives*

- The child participates in a Cope-A-Lot Contest: “Guess the Feeling.”
- The child receives an introduction to relaxation techniques by watching several video clips.
- The child participates in relaxation training.
- The child learns when and how to use relaxation.
- The child is assigned GTG practice task, which includes practicing relaxation (pp. 8-9).
- The child participates in Game Time: The child gets to play videogames for 10 minutes at the end of the session.

*Level 3/Parent Meeting 1:* While the child is working on Level 3, the parent meets with the coach to review upcoming sessions and address any questions or concerns.

Steps	Completed
<ul style="list-style-type: none"> <li>• Welcome to Level 3 and rapport building with participant.</li> </ul> <p><i>“Welcome back to Camp Cope-A-Lot! Today, you will be going to a waterfall with Charlie and the other campers. You will learn about a calming technique called relaxation that you can use when you are feeling scared or nervous. You will watch videos of other children practicing relaxation and Charlie will help demonstrate as well. But first, you will show what you have learned at the Camp Cope-A-Lot Contest. You can do it! Ten minutes of Game Time can be awarded, so give the contest your best try. Two new games have been added to Game Time for a total of four possible games. I will be sitting in the back of the room if you need help or have any questions. Are you ready? Let’s get started.”</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 3: “By the Waterfall.”</li> </ul>	
<ul style="list-style-type: none"> <li>• The participant completes level 3 of Camp Cope-A-Lot relatively independently, asking questions at “Checkpoints” and “Coach Check-In” points as needed. While the child is working, the coach meets with the caregiver as part of the first of two parent meetings. The coach reviews upcoming sessions and addresses any questions or concerns.</li> </ul> <p><i>Parent session: “In the next few sessions, your child will identify situations that make them scared or nervous and attempt to conquer their fears using a FEAR Plan that they are learning and practicing. Your child will start by working on situations that cause a little fear and gradually work through more anxiety-provoking situations. We will discuss these tasks again during</i></p>	



<p><i>Level 7. At present, are there any questions or concerns that you have about your child’s participation in the Camp Cope-A-Lot Program?”</i></p>	
<ul style="list-style-type: none"> <li>• The participant learns about the upcoming Camp Cope-A-Lot Contest and completes the Go-To-Gadget activity with the coach.</li> </ul> <p><i>“In the Level 4 Camp Cope-A-Lot Contest, we’re going to ask you to demonstrate relaxation. Practice on your own at least once this week so you’ll know what to do. The steps for completing relaxation are shown here on pages 8 and 9. Remember that relaxation is a great thing to do any time you are feeling tense or really stressed out, or when your body is telling you that you are feeling anxious.”</i></p>	
<ul style="list-style-type: none"> <li>• Provide participant with 10 minutes of Game Time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach enters password in order to exit level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach completes “Camper Performance Assessment,” which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach confirms time and date of next session with participant and caregiver.</li> </ul>	

Level 4: “In the Talent Show”

*Objectives*

- The child participates in a Cope-A-Lot Contest: “Practice Relaxation.”
- The child participates in an interactive activity, which focuses on identifying anxious thoughts.
- The child is introduced to the concept of “Thinking Traps.”
- The child begins to learn how to challenge anxious thoughts/“Thinking Traps.”
- The child is introduced to the second step in the 4-step, FEAR plan for coping with anxiety: “Expecting Bad Things to Happen?”
- The child participates in an interactive activity in which he/she identifies “Thinking Traps.”
- The child is assigned GTG practice task (pp. 10-11). He/she is asked to challenge anxious thoughts and use coping thoughts during the week in different situations when he/she might be “Feeling Frightened” and “Expecting Bad Things to Happen.”
- The child participates in Game Time: The child gets to play videogames for 10 minutes at the end of the session.

Steps	Completed
<ul style="list-style-type: none"> <li>• Welcome to Level 4 and rapport building with participant.</li> </ul> <p><i>“Welcome back to another great week at Camp Cope-A-Lot! Today, you will be practicing your relaxation skills as part of the Camp Cope-A-Lot Contest. Remember that you can win extra time at the end to play videogames as part of Game Time. Some new games have been added and now you will be able to choose between six different games. You will help Charlie and the other campers face their fears by participating in a talent show. The session will focus on anxious thoughts and something called “Thinking Traps,” which you learn all about at camp. I will be sitting in the back of the room if you need help or have any questions. Are you ready? Let’s get started.”</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 4: “In the Talent Show.”</li> </ul>	
<ul style="list-style-type: none"> <li>• The participant completes level 4 of Camp Cope-A-Lot relatively independently, asking questions at “Checkpoints” and “Coach Check-In” points as needed.</li> </ul>	
<ul style="list-style-type: none"> <li>• The participant learns about the upcoming Camp Cope-A-Lot Contest and completes the Go-To-Gadget activity with the coach.</li> </ul> <p><i>“See if you can challenge anxious thoughts and use coping thoughts in different situations when you might be ‘<u>F</u>eeling Frightened’ or ‘<u>E</u>xpecting Bad Things to Happen.’ Use this page</i></p>	

<p><i>of your Go-To-Gadget (point to p. 10) to remind you about coping thoughts. This week, try to use coping thoughts in different situations when you might be 'Expecting Bad Things to Happen.' In the Level 5 Camp Cope-A-Lot Contest, you will be asked to use coping thoughts to help others feel less anxious in different situations. For practice, write about a time when you used a coping thought this week to help you when you were feeling anxious. You can write your response on page 11 of your Go-To-Gadget."</i></p>	
<ul style="list-style-type: none"> <li>• Provide participant with 10 minutes of Game Time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach enters password in order to exit level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach completes "Camper Performance Assessment," which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach reviews practice task with parent for assistance at home.</li> </ul> <p><i>"For practice, your child has been asked to write about a time when he/she used a coping thought to help when he/she was feeling anxious. Responses can be recorded on page 11 of the Go-To-Gadget."</i></p>	
<ul style="list-style-type: none"> <li>• Coach confirms time and date of next session with participant and caregiver.</li> </ul>	

Level 5: “Through the Obstacle Course”

*Objectives*

- The child participates in a Cope-A-Lot Contest: “Unstuck: Challenging Thinking Traps.”
- The child is introduced to problem-solving strategies.
- The child participates in an interactive activity in which he/she practices problem solving.
- The child is introduced to the third step in the 4-step, FEAR plan for coping with anxiety: “Attitudes and Actions that Can Help.”
- The child participates in an interactive activity in which he/she ranks possible solutions.
- The child is assigned GTG practice task (pp. 12-13) in which he/she is asked to practice using the problem-solving steps on his/her own in situations where they feel nervous or anxious.
- The child participates in Game Time: The child gets to play videogames for 10 minutes at the end of the session.

Steps	Completed
<ul style="list-style-type: none"> <li>• Welcome to Level 5 and rapport building with participant.</li> </ul> <p><i>“Hello, Camper! I hope camp has been fun so far. You have been doing a great job and have been giving your best effort on each level of Camp Cope-A-Lot. During this week’s session, we are going to be helping Charlie and the other campers problem-solve while completing an obstacle course. They will need your help in making the best choice when solving the obstacles in the camp. Make sure you pay close attention to the steps while learning to problem solve, as you will need these tools again. Game Time will be awarded at the end for all of your hard work. I will be sitting in the back of the room if you need help or have any questions. Are you ready?”</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 5: “Through the Obstacle Course.”</li> </ul>	
<ul style="list-style-type: none"> <li>• The participant completes level 5 of Camp Cope-A-Lot relatively independently, asking questions at “Checkpoints” and “Coach Check-In” points as needed.</li> </ul>	
<ul style="list-style-type: none"> <li>• The participant learns about the upcoming Camp Cope-A-Lot Contest and completes the Go-To-Gadget activity with the coach.</li> </ul> <p><i>“If you are feeling frightened or expecting something bad to happen, find attitudes and actions that can help. A good start is to challenge your anxious thoughts by asking yourself these questions</i></p>	

<p><i>(point to p. 12):</i></p> <ul style="list-style-type: none"> <li>• <i>How accurate is this thought?</i></li> <li>• <i>How useful is the thought?</i></li> <li>• <i>What else could happen?</i></li> </ul> <p><i>After asking these questions, remember that it is time to problem-solve! Here are the steps one more time:</i></p> <ul style="list-style-type: none"> <li>• <i>Ask yourself, ‘What’s the problem?’</i></li> <li>• <i>Brainstorm ideas.</i></li> <li>• <i>Rank the ideas in order.</i></li> <li>• <i>Try out the highest ranked one. Keep trying ideas until the problem is solved.</i></li> </ul> <p><i>In the Level 6 Camp Cope-A-Lot Contest, you will be asked to use your problem-solving steps. In order to prepare for this challenge, try practicing these steps on your own in situations where you feel nervous or anxious. Write about a time when you used your problem-solving steps this week to help you when you were feeling anxious. You can write your response on page 13 of your Go-To-Gadget.”</i></p>	
<ul style="list-style-type: none"> <li>• Provide participant with 10 minutes of Game Time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach enters password in order to exit level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach completes “Camper Performance Assessment,” which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach reviews practice task with parent for assistance at home.</li> </ul> <p><i>“For practice, your child has been asked to write about a time when he/she used the problem-solving steps this week to help when he/she was feeling anxious. The problem-solving steps are outlined on page 12 of the Go-To-Gadget, which includes the following:</i></p> <ul style="list-style-type: none"> <li>• <i>Ask yourself, ‘What’s the problem?’</i></li> <li>• <i>Brainstorm ideas.</i></li> <li>• <i>Rank the ideas in order.</i></li> <li>• <i>Try out the highest ranked one. Keep trying ideas until the problem is solved.</i></li> </ul> <p><i>Your child’s responses can be recorded on page 13 of the Go-To-Gadget.”</i></p>	
<ul style="list-style-type: none"> <li>• Coach confirms time and date of next session with participant and caregiver.</li> </ul>	

Level 6: “On Visiting Day”

*Objectives*

- The child participates in a Cope-A-Lot Contest: “Fast Fingers: Problem-Solving Steps.”
- The child is introduced to the final step in the 4-step, FEAR plan for coping with anxiety: “Results and Rewards.”
- The child is introduced to the FEAR Totem Pole, FEAR Thermometer, and Totem Pole Challenges.
- The child participates in an interactive activity in which he/she builds his/her own FEAR Totem Pole.

Steps	Completed
<ul style="list-style-type: none"> <li>• Welcome to Level 6 and rapport building with participant and parent.</li> </ul> <p><i>“Welcome to Level 6 of Camp Cope-A-Lot! You have made it to the halfway point. Congratulations! For our remaining sessions, we are going to be doing something a little different with Charlie and the other campers. We are going to be working on your FEAR Plan. You will be working on the computer by yourself this week, but after today, you will also work with me, your coach, for the rest of the session. You will continue to earn Game Time at the end of each session for all your hard work!”</i></p> <p><i>The FEAR Plan steps will be practiced in situations in which you feel anxious or worried, so that you can gain confidence in using the FEAR Plan. You will see that you can cope and will find out that what you feared is unlikely to happen.</i></p> <p><i>The practice will be carried out in a slow, step-by-step manner. You will begin practicing in situations that make you only a little anxious or worried. Finally, we will work together to face your toughest situations.</i></p> <p><i>The goal of these challenges is not to remove all of your anxiety or worries, but to reduce it to a normal level and help you experience confidence that you can manage your anxiety and worries. You will experience anxiety when engaging in the challenges and practicing skills, but this expected and OK. Try your best not to avoid the anxious feelings. The more you practice facing situations, the less anxious or nervous you will feel and the more mastery and confidence you will build.</i></p> <p><i>The FEAR Plan steps need to be practiced often. Facing situations that make you feel anxious will be practiced over and</i></p>	

<p><i>over again. Practice will take place almost to the point that you will feel bored with the situation, rather than anxious about it. Practice is done both in and out of sessions.</i></p> <p><i>We are going to start on the computer so that Charlie and the campers can tell you more about Totem Pole Challenges, building our Totem Pole, and the Feelings Thermometer. I will be sitting in the back of the room if you need help or have any questions. Are you ready?"</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 6: "On Visiting Day."</li> </ul>	
<ul style="list-style-type: none"> <li>• The participant completes level 6 of Camp Cope-A-Lot relatively independently, asking questions at "Checkpoints" and "Coach Check-In" points as needed.</li> </ul>	
<ul style="list-style-type: none"> <li>• The participant completes the Go-To-Gadget activity with the coach.</li> </ul> <p><i>"So you and Charlie decided to test out your coping skills by doing some Totem Pole Challenges. I think that's a great idea. With my help, let's plan your Totem Pole Challenge for Level 7. Let's start at the bottom of your Totem Pole with the situation that you think is the least difficult for you. We will write down your plan on page 15 of your Go-To-Gadget. Don't forget, I will give you time to play on Game Time for every Totem Pole Challenge you finish. Ready? Let's get to our plan."</i></p>	
<ul style="list-style-type: none"> <li>• Provide participant with 10 minutes of Game Time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach enters password in order to exit level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach completes "Camper Performance Assessment," which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach shares first challenge and FEAR Plan with parent for assistance at home.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach confirms time and date of next session with participant and caregiver.</li> </ul>	

Level 7: “Putting the Plan into Action”

*Objectives*

- The child watches Charlie complete his first Totem Pole Challenge.
- The coach logs-in in order to meet with the child to complete the first Totem Pole Challenge and plan for the next Totem Pole Challenge(s).
- The child is assigned a GTG practice task (pp. 16-18) in which he/she is asked to complete one to two Totem Pole Challenges before the next session.
- The child participates in Game Time: The child gets to play videogames for 10 minutes at the end of the session.

*Level 7/Parent Meeting 2:* While the child is working on Level 7, the parent meets with the coach to engage in the following: 1] Explain rationale for Totem Pole Challenges, 2] explain how caregivers can support their child’s completion of the out-of-session, Totem Pole Challenges, and 3] address any questions or concerns.

Steps	Completed
<ul style="list-style-type: none"> <li>• Welcome to Level 7 and rapport building with participant.</li> </ul> <p><i>“Welcome back to Camp Cope-A-Lot. I hope that your first Totem Pole Challenge went well and that you are ready to tackle a few more of your challenges on your FEAR Totem Pole. While working on the computer, you will help Charlie complete one of his Totem Pole challenges. Next, I will help you practice and plan for your next Totem Pole Challenge. I will be talking with your parent while you are on the computer; however, I will be near the back of the room if you need any help or have any questions. Near the end of our session, you will be given time to play videogames on Game Time. Are you ready?”</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 7: “Putting the Plan into Action.”</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach conducts parent session while participant works on the computer.</li> </ul> <p><i>Parent Session: “As a review from Level 6, the FEAR Plan steps will be practiced in situations in which your child feels anxious or worried, so that he/she can gain confidence in using the FEAR Plan. You will see that he/she can cope and will find out that what he/she feared is unlikely to happen.</i></p> <p><i>The practice will be carried out in a slow, step-by-step manner. Your child will begin practicing in situations that make him/her only a little anxious or worried. Finally, we will work together to face your child’s toughest situations.</i></p>	



<p><i>The goal of these challenges is not to remove all of your child's anxiety or worries, but to reduce it to a normal level and help him/her experience confidence that he/she can manage his/her anxiety and worries. Your child will experience anxiety when engaging in the challenges and practicing skills, but this is expected and OK. Try your best to help your child not to avoid the anxious feelings. The more your child practices facing situations, the less anxious or nervous he/she will feel and the more mastery and confidence your child will build.</i></p> <p><i>The FEAR Plan steps need to be practiced often. Facing situations that make your child feel anxious will be practiced over and over again. Practice will take place almost to the point that your child will feel bored with the situation, rather than anxious about it. Practice is done both in and out of sessions. Your participation will be crucial to your child's success in the Camp Cope-A-Lot Program.</i></p> <p><i>Are there any concerns or questions that you would like to have addressed?</i></p>	
<ul style="list-style-type: none"> <li>• Coach logs in to complete the following with the participant:             <ul style="list-style-type: none"> <li>○ Review participant's Totem Pole and rearrange items on the hierarchy as needed. There are 10 categories of situations that are provided as possible stimuli for anxiety observed in participants including worries related to: school, individual safety, performing in front of others, being away from family, interacting with others, being good enough, or being alone. Custom items can also be added as appropriate.</li> <li>○ Items on the Totem Pole are placed in order from least difficult (at the bottom) to the most difficult (at the top).</li> <li>○ The coach reviews the participant's Totem Pole Challenge from the previous session and records responses on page 16 of the Go-To-Gadget.                 <ul style="list-style-type: none"> <li>▪ The participant rates his/her "pre-challenge" level of anxiety on the Feelings Thermometer.</li> <li>▪ The participant works through his/her FEAR Plan with the coach for the previous Totem Pole Challenge (p. 16).</li> <li>▪ The participant rates his/her "post-challenge" level of anxiety on the Feelings Thermometer.</li> </ul> </li> <li>○ The coach enters the participant's Totem Pole Challenge information into several fields on the computer.</li> </ul> </li> </ul>	

<ul style="list-style-type: none"> <li>▪ The coach answers “yes” or “no” to the question, “Did the camper complete any challenges since the last level?”</li> <li>▪ The coach types in a brief description of what the participant did for a homework challenge.</li> <li>▪ The coach clicks the “up/down” arrows to enter the number of additional minutes to reward the participant (1 minute per practice challenge).</li> <li>▪ The coach clicks “Continue” when finished.</li> <li>○ The participant’s FEAR Totem Pole from the previous level is shown on the computer. The coach and participant are given the opportunity to edit the participant’s FEAR Totem Pole as necessary.</li> <li>○ The participant and coach determine the next challenge(s) that will be practiced on the Totem Pole. The coach records this information on the computer while the participant enters the same information on page 17 of his/her Go-To-Gadget.</li> <li>○ Next, the participant works through the FEAR Plan with their coach for the Totem Pole Challenges outlined on page 17. This information is also recorded by the coach on the computer.</li> <li>○ The participant practices a skill or activity with his/her coach that will assist with their chosen Totem Pole Challenge (e.g., reading in front of an adult, making a mistake).</li> <li>○ The coach enters a narrative/anecdotal assessment of the results from the practice, Totem Pole Challenge.</li> <li>○ The coach enters a statement about the participant’s rewards and efforts (e.g., participant realized that it was better to try than not attempt the task).</li> <li>○ The participant plans with the coach up to two challenges that can be tried outside of the session (p. 18 of the Go-To-Gadget).</li> <li>○ The participant is reminded that they will earn more time to use in Game Time for every Totem Pole Challenge that he/she tries.</li> <li>○ The participant’s Totem Pole is reviewed one more time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Provide participant with 10-12 minutes of Game Time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach enters password in order to exit level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach completes “Camper Performance Assessment,” which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach reviews exposure practice task with parent for</li> </ul>	

assistance at home.	
<ul style="list-style-type: none"><li>• Coach confirms time and date of next session with participant and caregiver.</li></ul>	

Level 8: “Trying Something New”

*Objectives*

- The child watches Charlie complete another Totem Pole Challenge.
- The coach logs-in to meet with the child in order to review GTG Totem Pole Challenges, complete two Totem Pole Challenges, and plan for the next two Totem Pole Challenges.
- The child is assigned GTG practice task (pp. 19-21) in which he/she is asked to complete one to two Totem Pole Challenges before the next session.
- The child participates in Game Time: The child gets to play videogames for 10 minutes at the end of the session. The coach may decide to provide the child with one extra minute of Game Time for each out-of-session completed. This would include a maximum of two extra minutes of Game Time.

Steps	Completed
<ul style="list-style-type: none"> <li>• Welcome to Level 8 and rapport building with participant.</li> </ul> <p><i>“Welcome back to Camp Cope-A-Lot. I can’t wait to hear about your experiences with your previous Totem Pole Challenges and use of your FEAR Plan. Before this, you will be watching Charlie complete another one of his challenges. I hope you can relate to his experiences while he conquers his fears and worries. Afterwards, I will be helping you practice and plan for your next Totem Pole Challenges. I will be near the back of the room if you need any help or have any questions. Near the end of our session, you will be given time to play videogames on Game Time. Are you ready?”</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 8: “Trying Something New.”</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach logs in to complete the following with the participant:                             <ul style="list-style-type: none"> <li>○ Review participant’s Totem Pole and rearrange items on the hierarchy as needed.</li> <li>○ Items on the Totem Pole are placed in order from least difficult (at the bottom) to the most difficult (at the top).</li> <li>○ The coach reviews the participant’s Totem Pole Challenge (p. 17 of Go-To-Gadget) from the previous session and records responses on page 19 of the Go-To-Gadget.                                     <ul style="list-style-type: none"> <li>▪ The participant rates his/her “pre-challenge” level of anxiety on the Feelings Thermometer.</li> <li>▪ The participant works through his/her FEAR Plan with the coach and records responses on page 19.</li> </ul> </li> </ul> </li> </ul>	

<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>▪ The participant rates his/her “post-challenge” level of anxiety on the Feelings Thermometer.</li> </ul> </li> <li>○ The coach enters the participant’s Totem Pole Challenge information into several fields on the computer.             <ul style="list-style-type: none"> <li>▪ The coach answers “yes” or “no” to the question, “Did the camper complete any challenges since the last level?”</li> <li>▪ The coach types in a brief description of what the participant did for a homework challenge.</li> <li>▪ The coach clicks the “up/down” arrows to enter the number of additional minutes to reward the participant (1 minute per practice challenge).</li> <li>▪ The coach clicks “Continue” when finished.</li> </ul> </li> <li>○ The participant’s FEAR Totem Pole from the previous level is shown on the computer. The coach and participant are given the opportunity to edit the participant’s FEAR Totem Pole as necessary.</li> <li>○ The participant and coach determine the next challenge(s) that will be practiced on the Totem Pole. The coach records this information on the computer while the participant enters the same information on page 20 of his/her Go-To-Gadget.</li> <li>○ Next, the participant works through the FEAR Plan with their coach for the Totem Pole Challenges outlined on page 20. This information is also recorded by the coach on the computer.</li> <li>○ The participant practices a skill or activity with his/her coach that will assist with their chosen Totem Pole Challenge (e.g., reading in front of an adult, making a mistake).</li> <li>○ The coach enters a narrative/anecdotal assessment of the results from the practice, Totem Pole Challenge.</li> <li>○ The coach enters a statement about the participant’s rewards and efforts (e.g., participant realized that it was better to try than not attempt the task).</li> <li>○ The participant plans with the coach up to two challenges that can be tried outside of the session (p. 21 of the Go-To-Gadget).</li> <li>○ The participant is reminded that they will earn more time to use in Game Time for every Totem Pole Challenge that he/she tries.</li> <li>○ The participant’s Totem Pole is reviewed one more time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Provide participant with 10-12 minutes of Game Time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach enters password in order to exit level.</li> </ul>	

<ul style="list-style-type: none"><li>• Coach completes “Camper Performance Assessment,” which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.</li></ul>	
<ul style="list-style-type: none"><li>• Coach reviews exposure practice task with parent for assistance at home.</li></ul>	
<ul style="list-style-type: none"><li>• Coach confirms time and date of next session with participant and caregiver.</li></ul>	

Level 9: “Doing More New Things”

*Objectives*

- The participant watches a video of a child completing a Totem Pole Challenge.
- The coach logs-in to meet with the child in order to review GTG Totem Pole Challenges, complete two Totem Pole Challenges, and plan for the next two Totem Pole Challenges.
- The child is assigned GTG practice task (pp. 22-24) in which he/she is asked to complete one to two Totem Pole Challenges before the next session.
- The child participates in Game Time: The child gets to play videogames for 10 minutes at the end of the session. The coach may decide to provide the child with one extra minute of Game Time for each out-of-session completed. This would include a maximum of two extra minutes of Game Time.

Steps	Completed
<ul style="list-style-type: none"> <li>• Welcome to Level 9 and rapport building with participant.</li> </ul> <p><i>“Welcome back to Camp Cope-A-Lot. I can’t wait to hear about your experiences with your previous Totem Pole Challenges and use of your FEAR Plan. Before this, you will be watching one of Charlie’s friends complete a challenge. I hope you can relate to their experiences while they conquer their fears and worries. Afterwards, I will be helping you practice and plan for your next Totem Pole Challenges. I will be near the back of the room if you need any help or have any questions. Near the end of our session, you will be given time to play videogames on Game Time. Are you ready?”</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 9: “Doing More New Things.”</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach logs in to complete the following with the participant:                             <ul style="list-style-type: none"> <li>○ Review participant’s Totem Pole and rearrange items on the hierarchy as needed.</li> <li>○ Items on the Totem Pole are placed in order from least difficult (at the bottom) to the most difficult (at the top).</li> <li>○ The coach reviews the participant’s Totem Pole Challenge (p. 20 of Go-To-Gadget) from the previous session and records responses on page 22 of the Go-To-Gadget.                                     <ul style="list-style-type: none"> <li>▪ The participant rates his/her “pre-challenge” level of anxiety on the Feelings Thermometer.</li> <li>▪ The participant works through his/her FEAR Plan with the coach and records responses on page 22.</li> </ul> </li> </ul> </li> </ul>	

<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>▪ The participant rates his/her “post-challenge” level of anxiety on the Feelings Thermometer.</li> </ul> </li> <li>○ The coach enters the participant’s Totem Pole Challenge information into several fields on the computer.             <ul style="list-style-type: none"> <li>▪ The coach answers “yes” or “no” to the question, “Did the camper complete any challenges since the last level?”</li> <li>▪ The coach types in a brief description of what the participant did for a homework challenge.</li> <li>▪ The coach clicks the “up/down” arrows to enter the number of additional minutes to reward the participant (1 minute per practice challenge).</li> <li>▪ The coach clicks “Continue” when finished.</li> </ul> </li> <li>○ The participant’s FEAR Totem Pole from the previous level is shown on the computer. The coach and participant are given the opportunity to edit the participant’s FEAR Totem Pole as necessary.</li> <li>○ The participant and coach determine the next challenge(s) that will be practiced on the Totem Pole. The coach records this information on the computer while the participant enters the same information on page 23 of his/her Go-To-Gadget.</li> <li>○ Next, the participant works through the FEAR Plan with their coach for the Totem Pole Challenges outlined on page 23. This information is also recorded by the coach on the computer.</li> <li>○ The participant practices a skill or activity with his/her coach that will assist with their chosen Totem Pole Challenge (e.g., reading in front of an adult, making a mistake).</li> <li>○ The coach enters a narrative/anecdotal assessment of the results from the practice, Totem Pole Challenge.</li> <li>○ The coach enters a statement about the participant’s rewards and efforts (e.g., participant realized that it was better to try than not attempt the task).</li> <li>○ The participant plans with the coach up to two challenges that can be tried outside of the session (p. 24 of the Go-To-Gadget).</li> <li>○ The participant is reminded that they will earn more time to use in Game Time for every Totem Pole Challenge that he/she tries.</li> <li>○ The participant’s Totem Pole is reviewed one more time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Provide participant with 10-12 minutes of Game Time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach enters password in order to exit level.</li> </ul>	



<ul style="list-style-type: none"><li>• Coach completes “Camper Performance Assessment,” which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.</li></ul>	
<ul style="list-style-type: none"><li>• Coach reviews exposure practice task with parent for assistance at home.</li></ul>	
<ul style="list-style-type: none"><li>• Coach confirms time and date of next session with participant and caregiver.</li></ul>	

Level 10: “Mastering Something New”

*Objectives*

- The participant watches a video of a child completing a Totem Pole Challenge.
- The coach logs-in to meet with the child in order to review GTG Totem Pole Challenges, complete two Totem Pole Challenges, and plan for the next two Totem Pole Challenges.
- The child is assigned GTG practice task (pp. 25-27) in which he/she is asked to complete one to two Totem Pole Challenges before the next session.
- The child participates in Game Time: The child gets to play videogames for 10 minutes at the end of the session. The coach may decide to provide the child with one extra minute of Game Time for each out-of-session completed. This would include a maximum of two extra minutes of Game Time.

Steps	Completed
<ul style="list-style-type: none"> <li>• Welcome to Level 10 and rapport building with participant.</li> </ul> <p><i>“Hello, Camper! Welcome to Level 10 of Camp Cope-A-Lot. We only have two more sessions after tonight. We have really come far together and have accomplished many goals. I hope that you are as proud of your efforts as I am. I can’t wait to hear about your experiences with your previous Totem Pole Challenges and use of your FEAR Plan. Before this, you will be watching one of Charlie’s friends complete one of their challenges. I hope you can relate to their experiences while they conquer their fears and worries. Afterwards, I will be helping you practice and plan for your next Totem Pole Challenges. I will be near the back of the room if you need any help or have any questions. Near the end of our session, you will be given time to play videogames on Game Time. Are you ready?”</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 10: “Mastering Something New.”</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach logs in to complete the following with the participant:                             <ul style="list-style-type: none"> <li>○ Review participant’s Totem Pole and rearrange items on the hierarchy as needed.</li> <li>○ Items on the Totem Pole are placed in order from least difficult (at the bottom) to the most difficult (at the top).</li> <li>○ The coach reviews the participant’s Totem Pole Challenge (p. 23 of Go-To-Gadget) from the previous session and records responses on page 25 of the Go-To-Gadget.                                     <ul style="list-style-type: none"> <li>▪ The participant rates his/her “pre-challenge”</li> </ul> </li> </ul> </li> </ul>	

<p>level of anxiety on the Feelings Thermometer.</p> <ul style="list-style-type: none"> <li>▪ The participant works through his/her FEAR Plan with the coach and records responses on page 25.</li> <li>▪ The participant rates his/her “post-challenge” level of anxiety on the Feelings Thermometer.</li> </ul> <p>○ The coach enters the participant’s Totem Pole Challenge information into several fields on the computer.</p> <ul style="list-style-type: none"> <li>▪ The coach answers “yes” or “no” to the question, “Did the camper complete any challenges since the last level?”</li> <li>▪ The coach types in a brief description of what the participant did for a homework challenge.</li> <li>▪ The coach clicks the “up/down” arrows to enter the number of additional minutes to reward the participant (1 minute per practice challenge).</li> <li>▪ The coach clicks “Continue” when finished.</li> </ul> <p>○ The participant’s FEAR Totem Pole from the previous level is shown on the computer. The coach and participant are given the opportunity to edit the participant’s FEAR Totem Pole as necessary.</p> <p>○ The participant and coach determine the next challenge(s) that will be practiced on the Totem Pole. The coach records this information on the computer while the participant enters the same information on page 26 of his/her Go-To-Gadget.</p> <p>○ Next, the participant works through the FEAR Plan with their coach for the Totem Pole Challenges outlined on page 26. This information is also recorded by the coach on the computer.</p> <p>○ The participant practices a skill or activity with his/her coach that will assist with their chosen Totem Pole Challenge (e.g., reading in front of an adult, making a mistake).</p> <p>○ The coach enters a narrative/anecdotal assessment of the results from the practice, Totem Pole Challenge.</p> <p>○ The coach enters a statement about the participant’s rewards and efforts (e.g., participant realized that it was better to try than not attempt the task).</p> <p>○ The participant plans with the coach up to two challenges that can be tried outside of the session (p. 27 of the Go-To-Gadget).</p> <p>○ The participant is reminded that they will earn more time to use in Game Time for every Totem Pole Challenge that he/she tries.</p>	Empty cells for the right column
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○ The participant's Totem Pole is reviewed one more time.	
• Provide participant with 10-12 minutes of Game Time.	
• Coach enters password in order to exit level.	
• Coach completes "Camper Performance Assessment," which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.	
• Coach reviews exposure practice task with parent for assistance at home.	
• Coach confirms time and date of next session with participant and caregiver.	

Level 11: “Mastering More New Things”

*Objectives*

- The participant watches a video of a child completing a Totem Pole Challenge.
- The coach logs-in to meet with the child in order to review GTG Totem Pole Challenges, complete two Totem Pole Challenges, and plan for the next two Totem Pole Challenges.
- The child is assigned GTG practice task (pp. 28-30) in which he/she is asked to complete one to two Totem Pole Challenges before the next session.
- The child participates in Game Time: The child gets to play videogames for 10 minutes at the end of the session. The coach may decide to provide the child with one extra minute of Game Time for each out-of-session completed. This would include a maximum of two extra minutes of Game Time.

Steps	Completed
<ul style="list-style-type: none"> <li>• Welcome to Level 11 and rapport building with participant.</li> </ul> <p><i>“Hello, Camper! Welcome to Level 11 of Camp Cope-A-Lot. We only have one more session after tonight. We have really come far together and have accomplished many goals. I hope that you are as proud of your efforts as I am. I can’t wait to hear about your experiences with your previous Totem Pole Challenges and use of your FEAR Plan. Before this, you will be watching one of Charlie’s friends complete another challenge. I hope you can relate to their experiences while they conquer their fears and worries. Afterwards, I will be helping you practice and plan for your next Totem Pole Challenges. I will be near the back of the room if you need any help or have any questions. Near the end of our session, you will be given time to play videogames on Game Time. Are you ready?”</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 11: “Mastering More New Things.”</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach logs in to complete the following with the participant:                             <ul style="list-style-type: none"> <li>○ Review participant’s Totem Pole and rearrange items on the hierarchy as needed.</li> <li>○ Items on the Totem Pole are placed in order from least difficult (at the bottom) to the most difficult (at the top).</li> <li>○ The coach reviews the participant’s Totem Pole Challenge (p. 26 of Go-To-Gadget) from the previous session and records responses on page 28 of the Go-To-Gadget.                                     <ul style="list-style-type: none"> <li>▪ The participant rates his/her “pre-challenge”</li> </ul> </li> </ul> </li> </ul>	

<p>level of anxiety on the Feelings Thermometer.</p> <ul style="list-style-type: none"> <li>▪ The participant works through his/her FEAR Plan with the coach and records responses on page 28.</li> <li>▪ The participant rates his/her “post-challenge” level of anxiety on the Feelings Thermometer.</li> </ul> <p>○ The coach enters the participant’s Totem Pole Challenge information into several fields on the computer.</p> <ul style="list-style-type: none"> <li>▪ The coach answers “yes” or “no” to the question, “Did the camper complete any challenges since the last level?”</li> <li>▪ The coach types in a brief description of what the participant did for a homework challenge.</li> <li>▪ The coach clicks the “up/down” arrows to enter the number of additional minutes to reward the participant (1 minute per practice challenge).</li> <li>▪ The coach clicks “Continue” when finished.</li> </ul> <p>○ The participant’s FEAR Totem Pole from the previous level is shown on the computer. The coach and participant are given the opportunity to edit the participant’s FEAR Totem Pole as necessary.</p> <p>○ The participant and coach determine the next challenge(s) that will be practiced on the Totem Pole. The coach records this information on the computer while the participant enters the same information on page 29 of his/her Go-To-Gadget.</p> <p>○ Next, the participant works through the FEAR Plan with their coach for the Totem Pole Challenges outlined on page 29. This information is also recorded by the coach on the computer.</p> <p>○ The participant practices a skill or activity with his/her coach that will assist with their chosen Totem Pole Challenge (e.g., reading in front of an adult, making a mistake).</p> <p>○ The coach enters a narrative/anecdotal assessment of the results from the practice, Totem Pole Challenge.</p> <p>○ The coach enters a statement about the participant’s rewards and efforts (e.g., participant realized that it was better to try than not attempt the task).</p> <p>○ The participant plans with the coach up to two challenges that can be tried outside of the session (p. 30 of the Go-To-Gadget).</p> <p>○ The participant is reminded that they will earn more time to use in Game Time for every Totem Pole Challenge that he/she tries.</p>	Empty table cells
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○ The participant's Totem Pole is reviewed one more time.	
• Provide participant with 10-12 minutes of Game Time.	
• Coach enters password in order to exit level.	
• Coach completes "Camper Performance Assessment," which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.	
• Coach reviews exposure practice task with parent for assistance at home.	
• Coach confirms time and date of next session with participant and caregiver.	

Level 12: “Success...Last Day at Camp”

*Objectives*

- The participant watches Charlie complete his final Totem Pole Challenge.
- The coach logs-in to meet with the child in order to review GTG Totem Pole Challenges and complete final Totem Pole Challenge (p. 31).
- Charlie says goodbye.
- Coach reviews skills learned at Camp Cope-A-Lot and concludes intervention.

Steps	Completed
<ul style="list-style-type: none"> <li>• Welcome to Level 12 and rapport building with participant.</li> </ul> <p><i>“Congratulations, Camper! You have made it to the final level of Camp Cope-A-Lot. This will be our final session together. I hope that you have learned a lot of tools at camp for coping with your fears and worries. If you continue to practice these skills, I know that you will accomplish great things...just like Charlie. In this session, you will watch Charlie complete his final Totem Pole Challenge before we say ‘goodbye’ and wrap-up our time together. I will be near the back of the room if you need any help or have any questions. Near the end of our session, you will be given time to play videogames on Game Time. Are you ready?”</i></p>	
<ul style="list-style-type: none"> <li>• Help participant log in.</li> </ul>	
<ul style="list-style-type: none"> <li>• Position participant at the Bulletin Board for Level 12: “Success...Last Day at Camp.”</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach logs in to complete the following with the participant:                             <ul style="list-style-type: none"> <li>○ Review participant’s Totem Pole and rearrange items on the hierarchy as needed.</li> <li>○ Items on the Totem Pole are placed in order from least difficult (at the bottom) to the most difficult (at the top).</li> <li>○ The coach reviews the participant’s Totem Pole Challenge (p. 29 of Go-To-Gadget) from the previous session and records responses on page 31 of the Go-To-Gadget.                                     <ul style="list-style-type: none"> <li>▪ The participant rates his/her “pre-challenge” level of anxiety on the Feelings Thermometer.</li> <li>▪ The participant works through his/her FEAR Plan with the coach and records responses on page 31.</li> <li>▪ The participant rates his/her “post-challenge” level of anxiety on the Feelings Thermometer.</li> </ul> </li> <li>○ The coach enters the participant’s Totem Pole Challenge information into several fields on the computer.</li> </ul> </li> </ul>	



<ul style="list-style-type: none"> <li>▪ The coach answers “yes” or “no” to the question, “Did the camper complete any challenges since the last level?”</li> <li>▪ The coach types in a brief description of what the participant did for a homework challenge.</li> <li>▪ The coach clicks the “up/down” arrows to enter the number of additional minutes to reward the participant (1 minute per practice challenge).</li> <li>▪ The coach clicks “Continue” when finished.</li> <li>○ The participant’s Totem Pole is reviewed one last time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Participant continues with computer session, in which Charlie and the campers review skills learned and say, “Goodbye.”</li> </ul>	
<ul style="list-style-type: none"> <li>• Provide participant with 10-12 minutes of Game Time.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach enters password in order to exit level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Coach completes “Camper Performance Assessment,” which asks if the participant was able to complete the entire level and if the participant completed the Go-To-Gadget task for this level.</li> </ul>	
<ul style="list-style-type: none"> <li>• Intervention wrap-up and completion.</li> </ul> <p><i>“Congratulations on completing the 12-week, intervention program called Camp Cope-A-Lot. Here is a certificate of completion for all of your hard work that you can keep as a reminder of all of your efforts. In addition, you can keep your Go-To-Gadget to remind you of all of the skills you have learned, and which can also help you if you get overly anxious or worried in the future. You can keep practicing your FEAR Plan at home and school. The more you practice, the better you’ll be at coping with difficult situations. You can remember everything you learned at Camp Cope-A-Lot and everything you did here by just looking through your Go-To-Gadget, so keep it in a safe space.”</i></p>	
<ul style="list-style-type: none"> <li>• Coach conducts post-test procedures with parent and participant.</li> </ul>	

**Appendix H: Posttest Procedure Protocol**

Participant ID: \_\_\_\_\_

Steps	Completed
<ul style="list-style-type: none"> <li>• Posttest data is collected, which includes:                             <ul style="list-style-type: none"> <li>○ Administration of the Stress Survey Schedule for Individuals with Autism and Other Pervasive Developmental Disabilities (SSS) – Child Report.</li> <li>○ Administration of the Spence Children’s Anxiety Scale (SCAS) – Child Report.</li> <li>○ Administration of the Spence Children’s Anxiety Scale (SCAS) – Parent Report.</li> <li>○ Administration of the Autism Spectrum Rating Scale (ASRS) – Parent Report.</li> <li>○ Administration of the following Version B subtests to child participant from the Test of Everyday Attention for Children (TEA-Ch):                                     <ul style="list-style-type: none"> <li>▪ 1] Creature Count</li> <li>▪ 2] Opposite Worlds</li> <li>▪ 3] Walk, Don’t Walk</li> </ul> </li> </ul> </li> </ul>	
<ul style="list-style-type: none"> <li>• Parent is informed that he or she will be emailed or mailed an Informal Research Feedback Form.</li> </ul>	

### Appendix I: Informal Research Feedback Form

Thank you for your participation in our intervention-based study. Please take a few minutes to provide us with feedback on how we did and how much you liked the program.

Use the following 5-point, Likert scale to answer the following questions:

1= Strongly Disagree

2= Disagree

3= Neutral

4 = Agree

5 = Strongly Agree

1. The Camp Cope-A-Lot intervention seemed to reduce my child's difficulties with anxiety.

1                      2                      3                      4                      5

2. The Camp Cope-A-Lot intervention was easy to implement.

1                      2                      3                      4                      5

3. My child appeared willing and eager to participate in the intervention from week-to-week.

1                      2                      3                      4                      5

4. I would recommend this type of treatment to other individuals with similar needs (e.g., children with Autism and increased anxiety symptoms).

1                      2                      3                      4                      5

5. My child seemed comfortable working with the researcher.

1                      2                      3                      4                      5

6. The researcher seemed knowledgeable and competent regarding the subject matter of the intervention.

1                      2                      3                      4                      5

What, if any, barriers did you or your child face when participating in this intervention study?

What were some of the most difficult aspects of completing this study?

What were some of the easier aspects for you and your child while completing this study?

What were the most rewarding aspects of participating in this study?

Any other comments or suggestions that you would like to include?