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A Case Study of Implementing the Behavioral Intervention for Anxiety in Children with Autism (BIACA) in China

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A Case Study of Implementing the Behavioral Intervention for Anxiety in Children with Autism (BIACA) in China

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by

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ABSTRACT OF THE THESIS

A Case Study of Implementing

the Behavioral Intervention for Anxiety in Children with Autism (BIACA) in China

by

Xitao Liu

Master of Arts in Education

University of California, Los Angeles, 2018

Professor Jeffrey J. Wood, Chair

In this study, I implemented the Behavioral Interventions for Anxiety in Children with Autism (BIACA) on a 7-year-old Chinese girl with Autism Spectrum Disorder (ASD). The purpose is to assess the effectiveness of BIACA in China. My participant grew up in a middle-class Chinese family, and she was recruited from an autism research center/school in one of the largest cities in China. To assess the effectiveness of the treatment, I asked the participant's mother to rate the participant's behavioral performance after each treatment session, using Youth Top Problems (YTP).

After analyzing the YTP ratings, I concluded that using BIACA to treat anxiety is effective in children with ASD in China. Apart from recognizing that BIACA can potentially treat anxiety in children with ASD in China, findings from this study also raised several difficulties, such as adapting BIACA to Chinese culture and society, and improving assessments

and diagnostic tools in China. The findings could be used as encouraging evidence to promote the use of BIACA in China for treating anxiety in children with ASD for a larger population in the future.

The thesis of Xitao Liu is approved.

Sandra H. Graham

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CHAPTER ONE: OVERVIEW OF THE STUDY

Background

Autism Spectrum Disorder (ASD) includes a range of neurodevelopmental disorders (National Institute of Health [NIH], 2017), such as Aspergers, Autistic Disorder, and Perversive Developmental Disorder Not Otherwise Specified. People with ASD typically have difficulties "communicating and interacting with others" and have "symptoms that hurt the individual's ability to function socially, at school or work, or other areas of life" (NIH, 2017).

Nearly 1.5% of children in the U.S. suffer from ASD (Centers for Disease Control and Prevention [CDC], 2014). Children with ASD typically have difficulties dealing with changes, understanding social behaviors, and engaging in social events (NIH, 2017). These symptoms impair their daily life. Clinical anxiety is common in children with ASD (White, Oswald, Ollendick, & Scahill, 2009). The level of anxiety increases along with children's growth because the social environment becomes complex. Van Steensel, Bo¨gels, and Perrin (2011) reported that approximately 40% of children with ASD had at least one comorbid anxiety disorder. The most common ones were specific phobia (29.8%), OCD (17.4%), and social anxiety disorder (16.6%). When comorbid anxiety disorders are present, the distress and impairment among children with ASD are worse than ASD present alone (Nadeau1 et al., 2011).

Cognitive Behavioral Therapy (CBT) is a standard treatment for anxiety disorders in the general population. CBT is designed to treat inappropriate behaviors by adjusting maladaptive thoughts. Van Steensel et al. (2011) commented that utilizing CBT for treating anxiety in children with ASD was proven to be effective. Based on CBT, Wood, Drahota, Sze, Har, Chiu and Langer (2009) adjusted the procedure for children and developed BIACA, a modular intervention based on cognitive behavioral therapy for children with autism (around age 7 to 13)

who also have symptoms of anxiety and social dysfunction (Wood, Wood, & Drahota, 2014). The implementation of BIACA has yielded positive results in the U.S.

Study Purposes

There is a large population of children with ASD in China. The prevalence of mental illness in Chinese children aged 0 to 6 years old is about 1%. 36.9% of these children are diagnosed with ASD. The onset of ASD among Chinese children aged 0 to 14 years old was about 1% in 2015 (around 14 million children), and the number of newly diagnosed children with ASD exceeds 160,000 each year (WuCaiLu Children Behavior Research Center, 2015). However, there is little research on anxiety in children with ASD and systematic treatment for ASD in China. Accordingly, the purpose of this study is to implement and assess the effectiveness of BIACA in China. My research question is:

For children with autism and concurrent anxiety in China, can BIACA reduce their anxiety?

To explore my research question, I designed a study which implements the BIACA Program in China. The participant was recruited from an autism research center in one of the largest cities in China. All children in this institute are diagnosed with autism based on the Autism Behavior Checklist (ABC) and the Chinese version of the Psycho-educational Profile (C-PEP). The native language of the family that was chosen to participate in the study is Chinese. Since BIACA is a clinician supervised therapy and the details of the treatment are different from individual to individual, it takes time and effort to implement. Therefore, to achieve the best results, I chose only one child this time to participate in the study. During implementation, I reported the process of every session to my advisors, and adjusted the content of my next session under their supervision. The assessment used in this study is the Youth Top Problems (YTP). At

the beginning of the study, the child's mother described her top three anxiety-related concerns about the child in her own words and rated those same three problems on a 0 -10 scale before the first session and after each session.

Brief Organization of the Study

In the following chapters, I will first provide a brief review of studies assessing treating anxiety for children with ASD. Then I will introduce my research methodology, including participant information, site information, recruitment method, etc. Thirdly, I will report the procedure and results of my study. Finally, I will discuss the findings and its limitations. In the next chapter, I will review the literature on ASD pathology and prevalence of the disease in the U.S. and China, anxiety as a comorbidity in children with ASD, and the implementation of BIACA as a treatment of anxiety for children with ASD.

CHAPTER TWO: LITERATURE REVIEW

As mentioned in Chapter One, ASD is a neurodevelopmental disorder affecting 1% to 1.5% of children. Many of those who have been diagnosed with ASD have comorbid anxiety due to social dysfunction. Co-occurring anxiety can exacerbate children's ASD syndromes and has negative impacts on children's social, educational, and functional lives (Harkema & Coffee, 2014). Therefore, reducing anxiety in children with ASD could help alleviate symptoms of ASD. CBT has proven useful for treating anxiety in a general population and can be used to treat anxiety in children with ASD after modifications (Borkovec & Ruscio, 2001; In-Albon & Schneider, 2007; Sze & Wood, 2008). In the following chapter, I will review the literature on anxiety as a comorbidity with ASD, CBT for treating anxiety disorders, and CBT for treating anxiety in children with ASD. Additionally, I will review the literature on the current situation of ASD and ASD treatment in China.

Comorbid Anxiety in Children with ASD

Previous studies indicated that comorbid anxiety in children with ASD is quite prevalent (White, Oswald, Ollendick, & Scahill, 2009; MacNeil, Lopes, & Minnes, 2009; van Steensel, et al., 2011). White et al. (2009) reviewed 40 publications on ASD and anxiety between 1990 and 2008, and identified anxiety as one of the most common concerns in children with ASD. MacNeil et al. (2009) summarized literature related to diagnosis and assessment of comorbid anxiety in children with ASD, and they recognized the substantially high prevalence of anxiety in children with ASD. Van Steensel and colleagues (2011) concluded similar results after reviewing 31 ASD studies involving 2121 children with ASD under the age of 18 in North America, and conducted a meta-analysis to assess the prevalence of anxiety disorders in children with ASD. They found that approximately 40% of children with ASD "had at least one comorbid

DSM-IV anxiety disorder" (Van Steensel et al., 2011, p. 302). This prevalence rate is almost two times higher than the rate in typically developing children.

In addition to the high prevalence of comorbid anxiety in children with ASD, anxiety combined with children's ASD syndromes might result in significant adverse effects on patients' quality of life "health care usage and other social costs" (Van Steensel et al., 2011). For ASD children with comorbid anxiety, their anxiety symptoms tended to get worse as they became adolescents (White et al., 2009; van Steensel et al., 2011), and the severity of anxiety symptoms was associated with lower IQ scores (van Steensel et al., 2011).

Researchers have noticed that anxiety symptoms and disorders in ASD children were likely to be unrecognized or misdiagnosed clinically (MacNeil et al., 2009), and anxiety in children with ASD could have symptoms and patterns differing from typically developing children (White et al., 2009; MacNeil et al., 2009). As a result, researchers proposed to utilize multiple measures and informants to assess and treat anxiety disorders in children with ASD. Especially, utilizing CBT for treatment was proven to be effective (Van Steensel et al., 2011).

Cognitive Behavioral Therapy (CBT) for Treating Anxiety Disorders

Studies showed that CBT could reduce anxiety symptoms. Patients experience better improvements if they engage in CBT than no treatment or other nonspecific treatments (Borkovec & Ruscio, 2001). Due to its short treatment duration, CBT maintains low dropout rates and produces long-lasting strategies for managing anxiety. Studies showed that CBT could treat anxiety disorder in typically developing children effectively (In-Albon & Schneider, 2007; Sze & Wood, 2008).

The steps of traditional CBT treatment courses are as follows: first, make the clients be aware of their causes of anxiety and make them aware that feeling anxious is not their fault;

second, point out that the behaviors caused by anxiety affect their daily lives; third, make a hierarchy list of the situations that will cause anxiety, and gradually expose patients to the situations from least to most anxiety producing. Finally, teach the patient some coping skills such as relaxation at the same time (Lang, Regester, Lauderdale, Ashbaugh, & Haring, 2010). However, most children with ASD have a hard time with CBT because they have difficulty understanding their thoughts and feelings and are equally at odds with their language and social skills (Lang et al., 2010). Therefore, in order to use CBT to treat children with ASD, some modifications must be made to the traditional CBT (Lang et al., 2010). Adjustments to CBT in children with ASD are based on the symptoms and characteristics of ASD. Often, the changes include enhancing social skills in children with ASD and using visual aids, so that the modified CBT could be more useful for treating anxiety in children with ASD. Ratings and reports from parents and therapists showed that their children's anxiety symptoms have significantly improved (Lang et al., 2010).

Behavioral Interventions for Anxiety in Children with Autism (BIACA)

Some researchers (MacNeil, Lopes, & Minnes, 2009; Nadeau et al., 2011) were disappointed with the quality of current empirical studies and treatments, and observed that the gap between existing studies and clinical recommendations for assessment is substantial. In response to clinical recommendations, Wood et al. (2009) incorporated multiple treatment components into a standard CBT model, and developed BIACA to help the ASD population with anxiety reduction. These components were purposefully designed for treating anxiety in high-functioning children with ASD, aiming at improving ASD children's adaptive and interpersonal skills. BIACA is a flexible program providing therapy techniques that meet the needs of specific children and families. BIACA teaches children anxiety management skills and teaches parents

skills for supporting their children's social and emotional development (Wood, Wood, & Drahota, 2014).

In 2007, Sze and Wood specifically examined children with high-functioning autism (HFA) or Asperger syndrome, and stated that a high prevalence of this population suffers from comorbid anxiety disorders. They pointed out the necessity of developing efficacious treatments for this population, since ASD combined with anxiety disorders worsened ASD children's social difficulties and functional impairments. Sze and Wood (2007) developed a special CBT treatment for children with HFA or Asperger syndrome, and demonstrated a successful implementation in a case study on an 11-year-old girl with HFA. It marked the creation and first implementation of BIACA. In 2008, Sze and Wood provided more evidence to support the effectiveness of BIACA, and enhanced the treatment when treating a 10-year-old boy with Asperger syndrome.

Later, BIACA treatment was tested in 40 children with ASD, ages 7 to 11. Wood et al. (2009) used randomized control procedure — they randomly assigned children with ASD into a 16 session BIACA or a 3-month waitlist. Afterward, they compared the changes of anxiety symptoms for each child in the program (both groups). Through pairwise comparisons of individuals' baseline checklists and post-program checklists reported by children's parents, researchers found that 78.5% of children in the experimental group improved significantly based on the Clinical Global Impressions-Improvement scale criteria; whereas in the control group the percentage was only 8.7%.

Wood et al. (2009) proved the effectiveness of BIACA for children with ASD in the 7 to 11 age group. In 2015, Wood et al. tested BIACA in the 11 to 15 age group. They randomly assigned 33 early adolescents with ASD and anxiety disorders into a 16 session BIACA

treatment or waitlist — the same as they did in the 7 to 11 age group. Likewise, they compared pre-post checklists, and found that 79% in the treatment group had positive treatment response based on the Clinical Global Impressions-Improvement scale criteria; whereas in the control group the percentage is 28.6%. A difference between the Wood et al. (2009) and Wood et al. (2015) studies is that in the 7 to 11 age group, parents rated children's anxiety levels, while in the 11 to 15 age group, evaluators, parents, and adolescents rated anxiety symptoms. In both the 7 to 11 group and the 11 to 15 group, individuals in the treatment group outperformed those in the control group. In other words, BIACA is effective for children with ASD in the age group between 7 to 15.

Current Situation of Autism Spectrum Disorder (ASD) and Its Treatments in China

In China, the first diagnosis of ASD was in 1982, which was 40 years later than that in the U.S. (WuCaiLu Children Behavior Research Center, 2015). In recent years, people from various communities, such as doctors and educators, have drawn more attention to ASD. While the cause of ASD has not been precisely determined, some causes proposed include genetic factors, environmental factors, abnormal nervous system, etc. Since the causation of ASD is not clear, no specific medicine has been found for treating ASD. Currently, educational and psychological interventions are the most used treatments in China.

One of the earliest and most commonly used intervention for children with ASD in China is based on the Applied Behavior Analysis (ABA) (Tao, 2003). The ABA is an applied scientific discipline that studies how behaviors are learned and changed (Cooper, Heron, Heward, 1987). Common ABA techniques include rewards and reinforcement. One intervention based on ABA, Discrete Trials Teaching (DTT), is the most widely used intervention in training institutions in China. Studies on the effectiveness of DTT show that it could improve children's language skills

and increase new skills development, while reducing disruptive behaviors among children with ASD (Lovaas, 1987; McEachin, Smith, & Lovaas, 1993; Xu, Ding, & Fu, 2005; Wong et al., 2014). Other frequently used treatments for children with ASD in China are the Treatment and Education of Autistic and Related Communications of Handicapped Children (TEACCH), the Picture Exchange Communication System (PECS), Pivotal Response Training (PRT), and Early Start Denver Model (EDSM).

Recently, more ASD treatment institutions have emerged in China. The number of both children with ASD and special educators has increased (WuCaiLu Children Behavior Research Center, 2015). In K-12 education, there are programs provided by educational institutions for children with ASD, such as special education schools and special education classrooms in regular schools. Special education schools can be schools for all disabilities or schools specifically for children with ASD. Besides the educational support listed above, social support is also essential for treating children with ASD. Social support includes formal and informal social support. In China, ASD has been listed as a disability since 2005. The government, government-owned institutions, hospitals and some communities provide children with ASD certain medical and financial aid. Resources for informal social support include family and friends, social network, and volunteers. Since the most onset of ASD happens in early stages, early intervention is important for children (WuCaiLu Children Behavior Research Center, 2015). In this context, family diagnosis and intervention play critical roles in early intervention.

The biggest challenge for ASD treatment institutions is that they lack trained educators with professional knowledge about ASD and its treatments. Most educational institutions have various disadvantages: they lack scientific evaluations, trained educators, and appropriate class materials (Xiong & Sun, 2004; Wang, 2009; Deng et al., 2014). In addition, special education

schools and classrooms are still rare to find in China. Most children with ASD go to regular schools and classrooms.

As for the social support and early interventions, most families will miss the critical period for treating ASD in children because of insufficient knowledge about ASD or lack of financial support (Gao, 2008; Su & Guo, 2011; Zhu, 2012). Unlike in many western countries, many families fear to seek social support in China due to stigmatization (Wang, Michaels, & Day, 2011).

There are difficulties encountered when taking care of children with ASD, including demands of professional assistance, financial support, social acceptance, and others (Ren, 2014; Xiong, 2015; Wang, 2014; Liu, 2014). Taking care of children with ASD requires an investment in time and money. It also requires sufficient professional background knowledge. Currently, there are few institutions and systematic interventions for treating ASD and no research on anxiety in children with ASD in China. As a topic that has just started to be studied and discussed in China, more social and professional support is needed for treating children with ASD and co-occurring anxiety. Since BIACA has proven as an effective intervention for anxiety in children with ASD in the U.S. and has not been implemented in China, I designed this single case study to implement the BIACA program in China to see if it could reduce the anxiety in children with ASD. In the next following chapters, I will elaborate details and findings from my study.

CHAPTER THREE: METHODOLOGY

This study is a single case study, with a purpose of implementing and assessing the effectiveness of BIACA in China. Through this study, I explored the question of whether BIACA can reduce anxiety for children in China who have autism and concurrent anxiety. I designed the study to implement the BIACA Program in Chinese with a Chinese-speaking Family in China. I implemented the BIACA program to one child. The BIACA manual is personalized for anxiety in youth with ASD and has been designed in pilot clinical work. Assessments occurred 20 times: 1 before the first treatment, and 19 during treatment (after each treatment).

The participating family has a child (aged 7) with ASD and significant anxiety. The participating family was recruited from an autism research center in one of the largest cities in China through specific inclusion criteria. The child's parent received the YTP assessment during the study. In this chapter, I will elaborate more on recruitment, participant information, site information, treatment, measurement, assessment timeline, and data analysis.

Recruitment

The participant was recruited from an autism research center in one of the largest cities in China. The selection was based on certain inclusion criteria. First, I gave all parents and teachers a presentation about the BIACA Program. Parents who were interested in this program contacted me directly via phone and I did a phone screening. Parents self-selected into the study by contacting me directly. The first one who contacted me as well as meeting all the criteria was selected for the study. The non-selected participants were offered referrals to other similar services.

The prospective participant for this study must meet all three inclusion criteria listed below:

(1) Boys and girls with Autism Spectrum Disorder (ASD) between 7-13 years old.

(2) A child with comorbid depression, tic disorder or disruptive behavior disorders will be acceptable as long as the anxiety symptoms are considered the primary mental health problem (i.e., most impairing or distressing) after ASD.

(3) The child has anxiety symptoms that affect their daily life, such as: unable to concentrate in class, unable to interact with other people appropriately, or unable to fall asleep (Comer, 2013).

Participant

The participant was a 7-year-old girl who speaks Chinese as her native language. She was diagnosed as ASD-adjacent by CABS clinically in a hospital, and diagnosed as ASD by ABC and C-PEP in the autism research center. Her IQ score was 72 according to Wechsler Intelligence Scale for Children (WISC). The participant has visible anxiety symptoms according to the description from her mother and teachers: trouble concentrating in class, difficulty interacting with other people, and difficulty dealing with changes in daily life. Before the study, the participant did not receive any therapeutic interventions or medications to treat her ASD or anxiety symptoms.

Site Information

The site where the participating family was recruited from is located in one of the largest cities in China. It has the largest autism research center and school for preschoolers in China. The institute has six sites in other major cities in China. Children in these schools are aged from 3-7 years old. The primary teaching methodologies used in these schools are ABA, Individualized Education Program (IEP), and Music Therapy. Children are distributed to

different classes and receive different teaching methods based on their evaluation scores. Most children will go to an inclusion elementary school after 7 years of age.

The first half of the treatment sessions took place in a private classroom of the school. When doing the parent module, a teacher from the school stayed with the child. The other half of the treatment sessions took place in a private room of the child's house. When doing the parent module, another family member stayed with the child.

Treatment: BIACA Program

Overall, I directly followed the manual when implementing BIACA. However, due to cultural and case differences, there were some modifications made to the traditional BIACA program. All changes were made under the supervision of my advisors, who are professional clinicians. The process and content of sessions were reported to clinicians via email each week after the treatment session. In this section, I will articulate the procedures of both traditional BIACA and modified BIACA used in my study.

Traditional BIACA

In Wood et al. (2014), there are 16 sessions total in the traditional BIACA program, each lasting 90 minutes (45 minutes with the child and 45 minutes with the family), and the implementation is guided by the Behavioral Interventions for Anxiety in Children with Autism (BIACA) manual. The first few modules in the manual include instructions of 4 anxiety coping skills (e.g., affect recognition and cognitive restructuring), which are integrated into an acronym (the "KICK" plan) to help children remember the skills. It also includes a module of Hierarchy of Exposure in treatment to develop identifying all target behaviors: anxious and avoidant behaviors, social skill deficits, restricted and repetitive behaviors, or behavioral problems. The ultimate goals of developing this hierarchy of exposure were to set measurable outcomes (e.g.,

"make no sound while doing math problems"), which permits the delineation of specific proximal goals that gradually increase in difficulty. Anxiety and all other target behaviors are addressed using *In Vivo* exposure therapy techniques during sessions and in the community. Therapeutic concepts are taught using multimodal stimuli (e.g., discussion scaffolded by drawing, writing, photographs and cartoons, and acting) and guided Socratic questioning, relying upon children's special interests as metaphors to maintain enthusiasm and motivation. Children and parents are taught friendship skills (e.g., play-date hosting; joining peers at play) in several social modules. Parents (in weekly sessions) and school personnel (in two 1-hour school consultations over the course of treatment) are taught to support children in entering and maintaining conversations or play. These skills are practiced in session, at home, at school, in the community, and on play-dates. During the school consultations, a peer "buddy" program is implemented to enhance social inclusion. Habit reversal procedures are implemented for repetitive behaviors, using incompatible replacement behaviors. All target behaviors are reinforced with a reward system. The BIACA program employs a modular format that is guided by a treatment algorithm designed to address each child's unique clinical needs within the 16-session format. After each session, the implementer should report the process and content to a supervisor to verify the next session's content.

Modified BIACA

In my study, I worked with the family for 19 sessions in total, each lasting 60-90 minutes (typically half with the child and half with the family but sometimes varied with actual situations). The implementation is guided by the Behavioral Interventions for Anxiety in Children with Autism (BIACA) manual and I orally translated it into Chinese. The reason I extended my treatment length was that the participant did not initially achieve the ideal YTP

scores that were set by my supervisors. Therefore, we decided to do more sessions and ended until the participant reached 4 or under on the YTP scores. Once the participant dropped to 4 or under on YTP scores, I conducted another 2 sessions (at least) to sustain at 4 (or less) to terminate. After discussions with my supervisor, we decided to do only *In Vivo* Exposure to specifically target at the participant's YTPs.

The sessions from the manual were carried out as follows: 1) the first few modules included instructions for 4 anxiety coping skills, which are integrated into an acronym (the "KICK" plan) to help children remember the skills, 2) a module on Hierarchy of Exposure in treatment developed identifying all target behaviors: including anxious and avoidant behaviors, social skill deficits, restricted and repetitive behaviors, or behavioral problems. The ultimate goals of developing this hierarchy of exposure was to set measurable outcomes, which permitted the delineation of specific proximal goals that gradually increase in difficulty. Anxiety and all other target behaviors were addressed using *In Vivo* exposure therapy techniques during sessions. Therapeutic concepts were taught using multimodal stimuli and guided Socratic questioning, relying upon children's special interests as metaphors to maintain enthusiasm and motivation.

There were modules that I did not include in my study such as Social Modules and School Modules. These modules did not target the child's behavioral problems. All target behaviors were reinforced with a reward system. The BIACA program employs a modular format that is guided by a treatment algorithm designed to address each child's unique clinical needs. After each session, I reported the process and content to my supervisors to verify the next session's content.

Measurement

In my study, I used Youth Top Problems (YTP) as the measurement of my participant's anxiety severity. The mother of the child followed the entire 19-week intervention process, and participated in the study as the rater for her child's anxiety severity.

Youth Top Problems

The YTP approach is a well-validated evidence-based assessment procedure that is sensitive to treatment response and provides information separate from that generated by standard checklist ratings of child symptoms. YTP scores are highly sensitive to treatment, and have proven to be a valid measure of internalizing, externalizing, and total psychiatric symptoms among children involved in general mental health interventions when compared with much more extended symptom checklists such as the CBCL and YSR (Weisz et al., 2011).

In my study, in week one, the mother of my participant described her top 3 anxiety-related concerns about the child in her own words in their first session in the pre-test before the intervention started, and rated the severity level on a scale of 0 to10. Then, the mother was asked to rate 3 problems she identified before intervention again after our first session. Starting from session two, she continued to rate those same 3 problems on the 0 to10 scale at the end of each session in the following 18 weeks.

Assessment Timeline

To clarify, the mother participated in 20 assessments over a period of 19 weeks (19 sessions). The first time point of assessment is at the beginning of the first session, when I first met with the child. The second data point was collected after session one. The rest of the data points were collected after each treatment session. Each assessment took approximately 15 minutes.

The treatment contained 19 weekly sessions in total. Each session lasted for 60-90 minutes. The treatment included child only module, parent only module, and with parent and child together. As the length of treatment was decided based on the child's needs and performance (reflected by her mother's ratings), the treatment lasted 19 weeks, which was slightly longer than the planned 16-week sessions.

Data Analysis

First, I made a line chart of all the YTP scores to track any changes during the treatment. Then, I compared the first Pre-Treatment YTP scores with the last Post-Treatment YTP scores to see if the anxiety-related behaviors had improved. Last, I followed the analysis plan of Time-Series Data Analysis by Borckardt et al. (2008) to calculate the autocorrelation of YTP scores collected before and after each treatment session. I will present the results and analysis in the next chapter.

CHAPTER FOUR: RESULTS

Study Procedure

First Treatment Session and Baseline Comparison

As described in the previous session, before the separated session began, I asked the parent to do the first YTP assessment. The parent described her top three anxiety-related concerns about her child as: 1) Exhibits nonsensical speech when told she made a mistake or when faced with difficult tasks; 2) Engages in screaming when told she made a mistake or when faced with difficult tasks, and 3) Hits her face and body, twists her body when told she made a mistake or when faced with difficult tasks. She rated the YTPs as: 1) 8; 2) 6; and 3) 7, respectively. After the first treatment session, the mother rated again on the child's severity of anxiety of the 3 concerns that she pointed out previously. The rating scores stayed the same.

The first session aims to get familiar with and establish rapport with my participant and her family, and introduce BIACA procedure to the mother. In the first session, I did Child Module and Parent Module, and these two Modules were instructed in the following 18 weeks in each session. Follow the suggestion in the Manual (Wood, Wood, & Drahota, 2014), I left homework for both the child and the mother at the end of the first treatment session. I checked the completion condition in the next treatment session and distributed a reward accordingly. As stated previously, the pre-treatment and post-treatment ratings were the same.

Treatment Session Two to Session Four

I started teaching the child the "KICK" plan in the Child Module of the second treatment session. "KICK" represents K: Knowing I'm Nervous (somatic reaction to fear), I: Icky Thoughts (thoughts when getting afraid of something), C: Calm thoughts (thoughts that can make people feel calm and not anxious), and K: Keep practicing (what would you do in the scary

situation). In Parent Modules from week 2 to 4, I provided the mother information that could help to improve the child's social and life skills weekly, such as Individual Education Plan (IEP) and Self-Help Skills.

After week 4, the mother's ratings on her child's severity of anxiety stayed the same, meaning the first five ratings kept the pattern: 1) 8; 2) 6; and 3) 7, respectively.

The practicing of the "KICK" plan lasted until session 4.

Treatment Session Five

The child and parent participated in this session together and built up a fear hierarchy list. The list displays situations that would make the child feel anxious and rated the level of fear from low to high. This list was used for fear exposure as homework from week 5 to twelve.

After this session, the mother's ratings on her child's severity of anxiety stayed the same, which were 1) 8; 2) 6; and 3) 7, respectively.

Treatment Session Six to Session Eight

Started from session six, I began to implement the *In Vivo* Exposure to the child. I set up an exposure task for the child both for in-class exposure and home-based exposure. I also set goals and a Hierarchical Task Sheet that targeted the YTPs. The parent and I together build up a reward system for completing each task. The child was assigned to practice these tasks and achieve the goals both in-session and at home every day during these session periods.

The YTP scores started to show a slight change at the beginning of this session. In session six, the ratings are: 1) 8; 2) 6; 3) 7, respectively. In session seven, the ratings are: 1) 8; 2) 6; 3) 7, respectively. In session eight, the ratings are: 1) 8; 2) 6; 3) 6, respectively. Behavior 2 showed a decrease in session eight.

Treatment Session Nine to Session Eleven

The YTP score did not improve much after the *in vivo* exposure modules. According to the algorithm of the child and parent module, we repeated the procedures from Session Two to Session Four to review and consolidate the concept and content of the "KICK" plan. The YTP scores showed a slight decrease during these sessions. In session nine, the ratings are 1) 8; 2) 6; 3) 6, respectively. In session ten, the ratings are 1) 8; 2) 6; 3) 6, respectively. In session eleven, the ratings are 1) 8; 2) 5; 3) 6, respectively. The Behavior 2 decreased slightly in session eleven.

Treatment Session Twelve

In this session, we tried our previous in-class *in vivo* exposure, home-base *in vivo* exposure, and fear exposure assignment again to see if the "KICK" plan consolidation would help to improve the child's coping skills. The YTP ratings of this session are: 1) 8; 2) 5; 3) 5, respectively. The Behavior 3 decreased slightly in session Twelve.

Treatment Session Thirteen to Sixteen

Since the previous YTP assessment (especially for the nonsensical speech) did not improve too much, I changed my entire exposure plan under the supervision of my advisors. We decided to target only the "nonsensical speech and screaming" for the in-class *in vivo* exposure and assigned the other two behaviors as home-base *in vivo* exposure to the parents in session thirteen. We decided to start from lower difficulty level math problems, add modeling before doing tasks, and stop doing the fear exposure. Then we could gradually increase the task difficulty level and add other targeted behaviors one at a time in later sessions. We also set up the final goal of continuing to work on the treatment until all YTP decrease to 4 or under, then sustain at 4's (or less) for at least 2 sessions for me to terminate. Starting from session thirteen, the significant decrease displayed regarding the YTP ratings. By the end of session sixteen, all

YTPs dropped to 4 and under. In session thirteen, the ratings are 1) 7; 2) 4; 3) 5, respectively. In session fourteen, the ratings are 1) 7; 2) 4; 3) 5, respectively. In session fifteen, the ratings are 1) 5; 2) 2; 3) 4, respectively. In session sixteen, the ratings are 1) 4; 2) 1; 3) 3, respectively.

Treatment Session Seventeen and Session Eighteen

Since all YTPs have decreased to 4 and under, we repeated the procedure for two more sessions to sustain the results. We used the same procedures and rewards, and only increased the difficulty level of math problems a little for each trial. The YTP ratings stayed the same in these two sessions, which are 1) 4; 2) 1; 3) 3, respectively, in both sessions.

Treatment Termination: Treatment Session Nineteen

This is the last treatment session of the BIACA program. In this session, the child and the parent celebrated the progress and achievements that the child has been made during the treatment. Then I encouraged the child and the parent to keep practicing all skills that have been taught during treatment and made some plans. The YTP scores slightly decreased at the end of session nineteen. The ratings are 1) 4; 2) 0; 3) 3, respectively. The Behavior 2 was eliminated at the end of treatment.

Since Behavior 1, 2, and 3 all dropped to 4 or below 4, with the rating sustaining for two sessions, I terminated the treatment at session nineteen, given the criteria that my advisors had set before the modified treatment plan.. See all treatment procedure details in the Appendix.

Analysis

The overall pattern of rating changes is visualized in Figure 1. The change from pre-treatment to the end of the terminal session is presented in Figure 2.

Figure 1 shows that the YTP scores decreased throughout the treatment period in a general pattern. However, during session 1 to session 12, the YTP scores of Behavior 1 did not

change at all while the YTP scores of Behavior 2 and Behavior 3 only decreased slighty. From session 13 to session 16, the YTP scores of all behaviors significantly decreased to 4 or under. During the last three sessions (session 17-session 19), the YTP scores of Behavior 1 and Behavior 2 did not change while the YTP scores of Behavior 3 decreased a little.

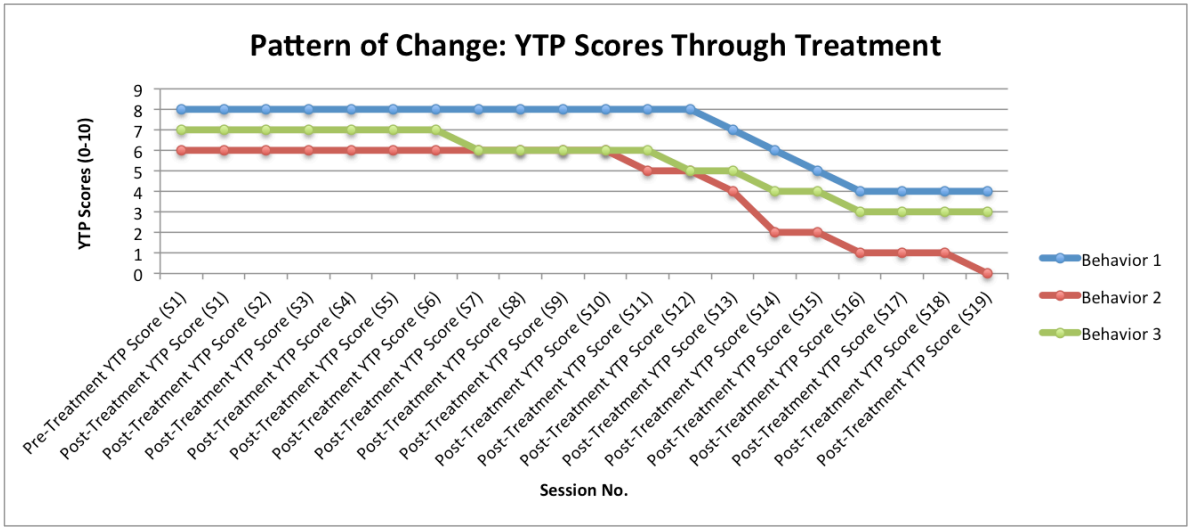

Figure 1. The pattern of Change: YTP Scores through Treatment

Figure 2 shows that there is a significant difference between Pre-Treatment and Post-Treatment YTP scores. The Post-Treatment YTP scores are lower for all three behaviors.

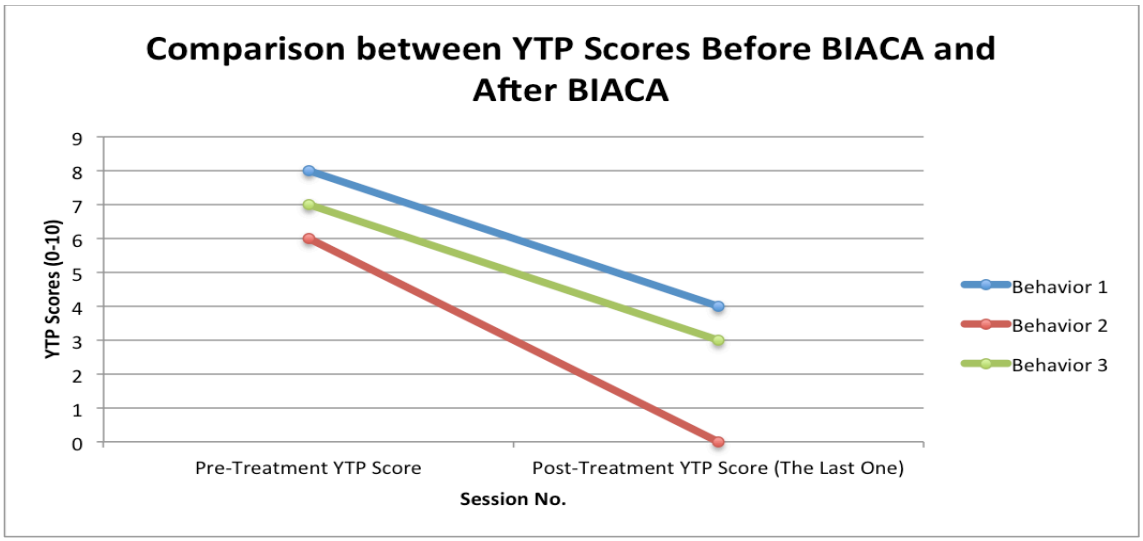

Figure 2. Comparison between YTP Scores Before BIACA and After BIACA

In Table 1, the pre-treatment and post-treatment scores are presented, and two data streams were created for each anxiety behavior rating. I considered the last recorded data before each treatment as the pre-treatment data, and the after-treatment rating for each session as the post-treatment data.

Table 1. Reported Scores and Autocorrelations

YTP Behavior 1: Exhibits nonsensical speech when told she made a mistake or when faced with difficult tasks.			YTP Behavior 2: Engages in screaming when told she made a mistake or when faced with difficult tasks.			YTP Behavior 3: Hits her face and body, twists her body when told she made a mistake or when faced with difficult tasks.		
Pre-Treatment	Post-Treatment	Autocorrelated Data Stream	Pre-Treatment	Post-Treatment	Autocorrelated Data Stream	Pre-Treatment	Post-Treatment	Autocorrelated Data Stream
8	8	Baseline	6	6	Baseline	7	7	Baseline
8	8	0.17677	6	6	0.22989	7	7	0.22222
8	8	0.17677	6	6	0.22989	7	7	0.22222
8	8	0.17677	6	6	0.22989	7	7	0.22222
8	8	0.17677	6	6	0.22989	7	7	0.22222
8	8	0.17677	6	6	0.22989	7	7	0.22222
8	8	0.17677	6	6	0.22989	7	6	-0.77778
8	8	0.17677	6	6	0.22989	6	6	0.22222
8	8	0.17677	6	6	0.22989	6	6	0.22222
8	8	0.17677	6	6	0.22989	6	6	0.22222
8	8	0.17677	6	5	-0.77011	6	6	0.22222
8	8	0.17677	5	5	0.29885	6	5	-0.77778
8	7	-0.82323	5	4	-0.70115	5	5	0.22222
7	6	-0.77778	4	2	-1.63218	5	4	-0.77778
6	5	-0.73232	2	2	0.50575	4	4	0.22222
5	4	-0.68687	2	1	-0.49425	4	3	-0.77778
4	4	0.35859	1	1	0.57471	3	3	0.22222
4	4	0.35859	1	1	0.57471	3	3	0.22222
4	4	0.35859	1	0	-0.42529	3	3	0.22222
Overall Corelation for Behavior 1		0.93700	Overall Corelation for Behavior 2		0.93200	Overall Corelation for Behavior 3		0.92100
Corresponding P-Value for Behavior 1		0.000	Corresponding P-Value for Behavior 2		0.000	Corresponding P-Value for Behavior 3		0.000
Post-Treatment YTP of session n is Pre-Treatment YTP of Session n+1								

In Table 1, I also provided the null correlated data stream for the ratings of each behavior. The null correlated data streams informed the changes of the scores before and after treatment sessions. I then calculated the autocorrelations based on each null correlated data stream, and reported p-values for each autocorrelation. The autocorrelations and corresponding p-values indicated that the treatment process is effective for the improvement of all three behaviors; especially, I observed a substantial improvement in the latter half of the treatment sessions.

Overall, implementing BIACA for treating anxiety symptoms in this 7-year old Chinese girl proves to be positive and effective.

CHAPTER FIVE: DISCUSSION

Affecting over 1% of children in China, ASD has become an increasingly aware problem among parents and schools. Anxiety is a frequently occurring comorbidity with ASD among children (White et al., 2009). However, parents and schools in China lack effective treatments for anxiety in children with ASD. BIACA is tested to be an efficacious treatment for anxiety in children with ASD in the U.S. Therefore, the purpose of this study is to implement and assess the effectiveness of BIACA in China. As a reminder, my research question is:

For children with autism and concurrent anxiety in China, can BIACA reduce their anxiety?

As mentioned previously, to answer this question, I implemented the BIACA Program in China. The participant was recruited from an autism research center/school. The participant is diagnosed with ASD and has significant anxiety symptoms. I conducted the treatment with her and her family for 19 sessions (19 weeks). Her mother used YTP scores to evaluate the participant's anxiety level.

The results show a general pattern of decreasing YTP scores, which indicates improvements in easing the child's anxiety symptoms. All three anxiety-related behaviors of the participant had improved after treatment. Therefore, generally speaking, the BIACA program is an effective treatment for anxiety in this child. According to this, we can conclude that BIACA program might be an effective treatment for anxiety in children with ASD in China and could be promoted in China. However, because this was the first implementation of BIACA in a new and different cultural setting, adaptations were needed. In this chapter, I will present some of the key findings from my study.

Modifications

Duration

A traditional BIACA treatment typically takes 16 sessions (weeks) to finish. However, my study took a longer time (19 sessions) to complete and to achieve ideal results. Besides, all three anxiety-related behaviors did not improve much through the first twelve sessions. Since the U.S. and China have very different cultural settings and this was the first implementation of BIACA in China, it would take a longer time to make modifications to adapt to the new environment.

Content

As stated in the methodology part, my supervisors and I made some adjustments to the traditional BIACA including removing the social and school modules for my implementation. One reason was that the child's YTP did not focus too much on the social domain. The other reason was it would be hard to implement these socially related modules in China. Unlike western culture, Asian culture is much more likely to stigmatize and discriminate people with mental illness (Lauber & Rössler, 2007). Stigmatization and fears of being labeled or treated differently would cause fear of reaching out for social support. Parents do not want to take their children to public places and let others know their children have a mental illness. Schools do not want to admit children with mental illness because they are considered to be aggressive and disruptive. Consequently, parents would hide their children from public and schools would drop or refer children with ASD to other special education schools. These situations make it more difficult to implement social and school modules in China.

Limitations

Data Analysis

Ideally, the data analysis using autocorrelation would use 7-14 baseline observations for each patient and at least 35 treatment observations in total (Borckardt, Nash, Murphy, Moore, Shaw, O'neil, 2008). In my study, I have 20 observation data. Therefore, the results from autoregressive cross-lagged model could only be a reference. For future studies and analysis, an increased number of baseline and treatment observations would bring more accurate results. Although my data did not meet the ideal number of data sets, it yielded quite strong results.

Manual Instruction

BIACA is a treatment program that needs to be guided by a structured manual. During the treatment sessions, the implementer needs to be supervised by trained clinicians. Due to the nature of BIACA, the implementer is required to follow the instructions from both the manual and clinicians. Thus, the manual needs to be thorough and detailed. The implementer should be getting in touch with clinicians frequently and have some knowledge of ASD. It might take a more significant effort to implement BIACA to a large population.

Future Study

Diagnostic Test

The ratings and standard of IQ tests and ASD diagnoses are different in China from that in the U.S. There is no systematic anxiety test especially for anxiety in children with ASD in China. Parents rate the YTP scores, but their standards can be different from the implementers' and clinicians'. In future studies, we could use multiple assessments and multiple informants to diagnose the anxiety of children with ASD better.

Education on Background Knowledge of ASD

As stated above, stigmatization and lack of social support are one of the most significant challenges that the ASD population faces in China. Increasing public awareness and education of mental illness and effective treatments could help to reduce stigma towards mental illness (Brown & Bradley, 2002). Therefore, it would be reasonable for schools and volunteer groups to provide education on diagnosis, symptoms, and treatments for children with ASD to overcome stigma.

Conclusion

In this study, I implemented the BIACA program on a 7-year-old girl in China. The participant is diagnosed with ASD and has significant anxiety symptoms. The purpose of this study is to implement and assess the effectiveness of BIACA in China. My study explores whether BIACA is effective and can reduce the anxiety in children with ASD in China. The study yielded positive results. Based on YTP scores, the anxiety level of this participant has significantly decreased after treatment. Therefore, it is worthwhile to conduct future research and implement BIACA on a larger population of children who suffer from ASD and co-occurring anexity.

Appendix

Treatment Procedures in Detail

Session One:

The first session was to get familiar and establish rapport with the family.

With Parent and Child Together:

In this 10-minute introduction session, I briefly introduced the duration and format of each session and the whole program.

Pre-treatment Assessment:

Before the separated session began, I asked the parent to do the YTP assessment. The parent described her top three anxiety-related concerns about her child as: 1) Exhibits nonsensical speech when told she made a mistake or when faced with difficult tasks; 2) Engages in screaming when told she made a mistake or when faced with difficult tasks; 3) Hits her face and body, twists her body when told she made a mistake or when faced with difficult tasks. She rated the YTPs as: 1) 8; 2) 6; 3) 7, respectively.

Child Module:

During this module, the child explored the classroom. I oriented child to the goals of program. We talked about her summer trips with families and her toys. I also got a sense of how much she knew about autism. Her parents did not deliberately avoid telling her about her autism, and she knew she was something different from other children. I also linked her anxiety with autism. At the end of session, I assigned her homework #1 (wrote about a time when she felt good in the past week and, if possible, thoughts and body feelings) and elaborate the rewards system (a smiley face for completing her homework by herself or under the help of her parents, smiley faces would add up to bigger rewards such as a candy).

Parent Module:

At the beginning of the session, I first reviewed the content of child module. After that, we briefly went through the purpose of session (to get more information of the family and child), introduced myself, oriented parent her role in this program (to learn how to and help her child build up new coping skills), conducted the ABC analysis, discussed the nature of ASD and causes and patterns of child's anxiety, described the treatment plan, and assigned the parent homework #1 (to track 2-3 anxious behaviors of the child).

Post-treatment Assessment:

The parent rated the YTPs again after the session: 1) 8; 2) 6; 3) 7, respectively.

Session Two:

Child Module:

In this session, we reviewed the child's homework #1 first (see blow). Her mother helped her to record it. Then I used cartoon to help her identify various emotion states (fear, anger, sadness, and happiness). Then we learned the "K" and "I" steps of "KICK" plan using example of a situation when the child felt anxious.

K: Knowing I'm Nervous (somatic reaction to fear).

I: Icky Thoughts (thoughts when get afraid of something).

At last, I assigned the child homework #2 (wrote about a time when she felt anxious in the past and, if possible, thoughts and body feelings).

Child Homework #1:

A Time I was Happy	
What was going on?	Met the new teacher (me).
How did my body feel?	Body temperature increased.
What was I thinking about?	Wanted to jump.

The child got one smiley face for completing child homework #1 (see Homework Reward Chart in *Session Five*).

With Parent and Child Together:

Before we started the parent module, we reviewed the content of the child module with her parent first. Then we discussed the reward the child might earn for doing 4 weeks of homework (one smiley face for completing each homework and maybe a candy for 4 smiley faces). The reward would be discussed in details in later session.

Parent Module:

First, we briefly reviewed the parent's homework #1 (see below). Then I introduced her the Individual Education Plan (IEP). The child has already been receiving the IEP since she came into the autism school. The IEP teachers set up specific learning plans and goals for each children. The parent was satisfied with the IEP this school provided. I also encouraged her to participate more in child's IEP. At last, I assigned the parent homework #2 (same as #1).

Parent Homework #1

Behavior Record Form		
Anxious Behavior	My Response To My Child	My Child's Reaction
Felt scared when hearing the sound of a bus start up.	Comforted her immediately.	Calm down pretty soon.
Twisted body when knowing class schedule changed.	Ignored her first, then comforted her.	Took a longer time to calm down.

Post-treatment Assessment:

1) 8; 2) 6; 3) 7, respectively.

Session Three:

Child Module:

In this session, we first reviewed the child's homework #2 (see below) and the "K" and "I" steps we learned in last session. Then I introduced the "C" step of "KICK" plan using emotion states cartoons and scaffolding approach.

C: Calm thoughts (thoughts that can make people feel calm and not anxious).

Typical calm thoughts including: 1) How likely is the bad thing to happen; 2) If it did happen, so what?

Then the child brainstormed a fear situation (making mistakes in math test) to go over and practice the "K", "I", and "C" steps.

At last, I assigned the child homework #3 (wrote about a time when she felt anxious in the past and, if possible, thoughts and body feelings).

Child Homework #2

A Time I was Nervous	
What was going on?	Made a mistake in math homework.
How did my body feel?	Did not feel good, hard to explain.
What kinds of bad things did I think might happen?	The teacher and mom would mad at me.

The child got one smiley face for completing child homework #2 (see Homework Reward Chart below).

With Parent and Child Together:

Before we started the parent module, we reviewed the content of the child module with her parent first. Then we discussed the reward the child might earn for doing 4 weeks of homework (one smiley face for completing each homework and maybe a candy for 4 smiley faces). The reward would be discussed in details in later session.

Parent Module:

In this session, we first reviewed the parent's homework #2 (see below). Then I briefly introduced the topic and goal of this session: Explain the important role that parents can play in helping to improve their child's anxiety problems involves helping the child to become more independent. Then we identified 3 self-help skills to target for child (bathing or showering and drying self independently; washing and drying hair with towel or hair dryer; using microwave oven for heating, baking or cooking). I helped to realize the struggle that child might meet and how to help her through. At last, I assigned the parent homework #3 (to help the child do the 3 self-help skills we discusses in session).

Parent Homework #2

Behavior Record Form		
Anxious Behavior	My Response To My Child	My Child's Reaction
Avoided to attend a math class.	Told her the teacher would not mad at her.	Went to the math class later.
Screamed when doing math problems.	Ignored her first, then comforted her.	Took a longer time to calm down.

With Parent and Child Together:

In this session, I briefly explained the purpose and importance of the exercise (practice 3 self-help skills) and collected the oral agreement of doing the exercise from the child.

Post-treatment Assessment:

1) 8; 2) 6; 3) 7, respectively.

Session Four:

Child Module:

In this session, we first reviewed the child homework #3 (see below). Then kept elaborating and practicing the "K", "I", and "C" steps of "KICK" plan. I introduced the last "K" step of this plan.

K: Keep practicing (what would do in the scary situation).

The last step is important because it would make the child feel more confident and helped the child know what to expect when doing something new. Then I reviewed the intact "KICK" plan with the child and let her prepare explaining this plan to her parents later.

At last, I assigned her homework #4 (to remember each step of the KICK Plan, no note-taking required).

Child Homework #3

A Time This Week When I Felt Anxious	
What was going on?	Went to a math class.
How did my body feel?	Could not breath well.
What were my icky thoughts?	The math teacher would be mad at me when I made mistakes in class.
My calm thoughts!	As long as I tried my best to perform, the math teacher would not treat me bad.

The child got one smiley face for completing child homework #3 (see Homework Reward Chart below).

With Parent and Child Together:

First, the child and I together reviewed the content of the child module, and the child explained the "KICK" plan to her mother. Then we discussed the rewards for completing child homework (one smiley face for completing each homework and a strawberry candy for 4 smiley faces). We also reviewed parent homework #3.

Parent Homework #3

The self-help skills:

1. Bathing or showering and drying self independently.

2. Washing and drying hair with towel or hair dryer.

3. Using microwave oven for heating, baking or cooking.

The parent reported that the child were happy to do the self-help skills independently. At first, it was a little hard for the child to dry her hair and to use microwave because of lack of strength. However, after encouraging her and offering her choices (do you want to take a minute to continue?), she could complete the skills.

Post-treatment Assessment:

1) 8; 2) 6; 3) 7, respectively.

Session Five:

Parent/Child Module:

With Parent Alone:

In this session, I introduced the purpose and rationale for fear hierarchy. Setting a fear hierarchy is helpful for child to gradually learn how to deal with scary and anxious situations.

With Parent and Child Together.

In this session, we set up the fear hierarchy together (see below) and assigned the low-level situations (the lowest two) for home exposure assignment.

Fear Hierarchy Sheet

My Fear List		
Fear Level	Fear Rating (0-10)	Situation
Low	1	Things do not organize in certain pattern.
	3	Seeing mother sweeps floor.
	3-4	Cannot complete tasks that others give.
Medium	5	Hearing loud sound.
	7	When a teacher gets mad at her.
High	9	Playing with peers.
	9	Changing of plans.
	9-10	Being scolded by her mother.

We also reviewed the child homework #4. The child could remember the "KICK" plan well. She got one smiley face for completing child homework #3 (see below).

Homework Reward Chart

Homework Reward Chart	
Homework No.	Reward
#1	A Smiley Face
#2	A Smiley Face
#3	A Smiley Face
#4	A Smiley Face
In Total	A Strawberry Candy

Post-treatment Assessment:

1) 8; 2) 6; 3) 7, respectively.

Session Six

Starting this session, we began to do the exposure practices targeting the YTPs.

First, I set up a hierarchy task regarding the YTPs for in-class and homework exposure practice (see below).

Hierarchy Task Sheet Targeting at YTPs

Hierarchy Task Sheet	
Task: Do math problems for 15 minutes (approximately 30 arithmetic calculation problems within 10, including 25 basic problems and 5 harder problems).	
Goal	Completion State
Calm Voice (no nonsense speech, no yelling and screaming). Calm Hands (no hitting on face or any part of body). Calm Body (no stamping feet, no body twisting and no waving hands).	
Rewards: One Completion=One Flower; Three Flowers=One Smiley Face; Three Smiley Faces=One Selected Flavored Candy	

Child Module:

In this session, I introduced the rationale of exposure and reviewed the "KICK" plan. Then we used the hierarchy task sheet as her in-class in vivo exposure (see below).

In-Class *In Vivo* Exposure

Hierarchy Task Sheet	
Task: Do math problems for 15 minutes (approximately 30 arithmetic calculation problems within 10, including 25 basic problems and 5 harder problems).	
Goal	Completion State
Calm Voice	Not Complete
Calm Hands	Complete (Flower)
Calm Body	Not Complete
Rewards: One Completion=One Flower; Three Flowers=One Smiley Face; Three Smiley Faces=One Selected Flavored Candy	

Since she only collected one Flower in class, she did not get the candy reward.

With Parent and Child Together:

First, we reviewed the fear exposure assignment from last week. The parent reported that the child slighted resisted when first exposed, but then she was okay with the fear situations after several attempts. I gave the child praise for her good performance. Then I assigned the hierarchy

task sheet for the child as her home-based in vivo exposure for the following week before next session (see below).

Home-Base *In Vivo* Exposure

Hierarchy Task Sheet						
Task: Do math problems for 15 minutes (approximately 30 arithmetic calculation problems within 10, including 25 basic problems and 5 harder problems).						
Goal	Completion State					
	Sun	Mon	Tues	Wed	Thu	Fri
Calm Voice Calm Hands Calm Body						
Rewards: One Completion=One Check; Three Checks=One Smiley Face; Three Smiley Faces=One Selected Flavored Candy						

Parent Module:

In this session, I briefly introduced the purpose of this module (to move forward in the exposure hierarchy while ensuring the child is getting maximal benefit by participating willingly and not engaging in excessive cognitive avoidance or behavior problems that s/he is not habituating properly). As reported previously, the child was okay with the exposure of the fear situations. We decided to do the next two fear situations on the fear hierarchy sheet in low-high sequence for the next homework exposure assignment. I also told her techniques when the child engaged in avoidance behaviors (CALM, ABCs, and Planned Ignoring).

With Parent and Child Together:

We briefly reviewed the content of child module and explained the home-base in vivo exposure and fear exposure assignment to the child.

Post-treatment Assessment:

1) 8; 2) 6; 3) 7, respectively.

Session Seven:

Child Module:

In this session, we repeated the procedure of last session. First, I reviewed the "KICK" plan with her. Then we did a in-class *In Vivo* exposure (see below).

In-Class *In Vivo* exposure

Hierarchy Task Sheet	
Task: Do math problems for 15 minutes (approximately 30 arithmetic calculation problems within 10, including 25 basic problems and 5 harder problems).	
Goal	Completion State
Calm Voice	Not Complete
Calm Hands	Not Complete
Calm Body	Not Complete
Rewards: One Completion=One Flower; Three Flowers=One Smiley Face; Three Smiley Faces=One Selected Flavored Candy	

Since she collected no Flower in class, she did not get the candy reward.

With Parent and Child Together:

First, we reviewed the fear exposure assignment from last week. The parent reported that the child slighted resisted when first exposed. Because the fear level increased, so it took longer time for her to habituate. She was okay with the fear situations after several attempts. I gave the child praise for her good performance. Then I assigned the hierarchy task sheet for the child as her home-based in vivo exposure for the following week before next session. I used the same sheet as last week.

Parent Module:

In this session, we first reviewed the home-base in vivo exposure (see below).

Home-Base *In Vivo* Exposure

Hierarchy Task Sheet						
Task: Do math problems for 15 minutes (approximately 30 arithmetic calculation problems within 10, including 25 basic problems and 5 harder problems).						
Goal	Completion State					
	Sun	Mon	Tues	Wed	Thu	Fri
Calm Voice	Not Complete	Not Complete	Not Complete	Not Complete	Not Complete	Not Complete
Calm Hands	Not Complete	Not Complete	Not Complete	Complete (Flower)	Complete (Flower)	Not Complete
Calm Body	Complete (Flower)	Not Complete	Not Complete	Complete (Flower)	Not Complete	Not Complete
Rewards: One Completion=One Check; Three Checks=One Smiley Face; Three Smiley Faces=One Selected Flavored Candy						

Based on the reward system, the child did not receive any candy during past week.

Then we reviewed the fear exposure assignment from last week. As the parent reported in previous child module, the child met some difficulties when exposing to higher level fear situations. She presented avoidant behaviors such as running away and screaming. However, after few attempts, it took shorter time for her to habituate the fear situations and eventually okay with them. She also reported using Planned Ignoring and CALM when doing the exposure and it worked well. We decided to continue doing the next two fear situations on the fear hierarchy sheet in low-high sequence for the next homework exposure assignment.

With Parent and Child Together:

We briefly reviewed the content of child module and explained the home-base in vivo exposure and fear exposure assignment to the child.

Post-treatment Assessment:

1) 8; 2) 6; 3) 6, respectively.

Session Eight:

In this session, we repeated the procedure of last session. First, I reviewed the "KICK" plan with her. Then we did a in-class exposure (see below).

In-Class *In Vivo* exposure

Hierarchy Task Sheet	
Task: Do math problems for 15 minutes (approximately 30 arithmetic calculation problems within 10, including 25 basic problems and 5 harder problems).	
Goal	Completion State
Calm Voice	Not Complete
Calm Hands	Complete (Flower)
Calm Body	Complete (Flower)
Rewards: One Completion=One Flower; Three Flowers=One Smiley Face; Three Smiley Faces=One Selected Flavored Candy	

Since she only collected two Flowers in class, she did not get the candy reward.

With Parent and Child Together:

First, we reviewed the fear exposure assignment from last week. The parent reported that the child exhibited avoidance behaviors in the first few attempts. Because the fear level increased, so it took longer time for her to habituate. She was okay with the fear situations eventually. I gave the child praise for her good performance. Then I assigned the hierarchy task sheet for the child as her home-based in vivo exposure for the following week before next session. I used the same sheet as last week.

Parent Module:

In this session, we first reviewed the home-base in vivo exposure (see below).

Home-Base *In Vivo* Exposure

Hierarchy Task Sheet						
Task: Do math problems for 15 minutes (approximately 30 arithmetic calculation problems within 10, including 25 basic problems and 5 harder problems).						
Goal	Completion State					
	Sun	Mon	Tues	Wed	Thu	Fri
Calm Voice	Complete (Flower)	Not Complete	Not Complete	Not Complete	Not Complete	Not Complete
Calm Hands	Complete (Flower)	Not Complete	Complete (Flower)	Not Complete	Not Complete	Not Complete
Calm Body	Complete (Flower)	Complete (Flower)	Not Complete	Not Complete	Not Complete	Not Complete
Rewards: One Completion=One Check; Three Checks=One Smiley Face; Three Smiley Faces=One Selected Flavored Candy						

She successfully collected three Flowers on Sunday, so she got a strawberry candy on Sunday. Then we reviewed the fear exposure assignment from last week. As the parent reported in previous child module, the child exhibited avoidance behaviors in the first few attempts when exposing to higher level fear situations. However, after few attempts, she eventually habituated the fear situations. We decided to continue doing the next two fear situations on the fear hierarchy sheet in low-high sequence for the next homework exposure assignment.

With Parent and Child Together:

We briefly reviewed the content of child module and explained the home-base in vivo exposure and fear exposure assignment to the child.

Post-treatment Assessment:

1) 8; 2) 6; 3) 6, respectively.

Session Nine to Eleven:

The YTP score did not improve much after the in viso exposure modules. According to the algorithm of child and parent module, we repeated the procedures from Session Two to Session Four to review and consolidate the concept and content of "KICK" plan.

Post-treatment Assessment:

Session Nine: 1) 8; 2) 6; 3) 6, respectively.

Session Ten: 1) 8; 2) 6; 3) 6, respectively.

Session Eleven: 1) 8; 2) 5; 3) 6, respectively.

Session Twelve:

In this session, we tried our previous in-class in vivo exposure, home-base in vivo exposure, and fear exposure assignment again to see if the "KICK" plan consolidation would help to improve the child's coping skills.

Post-treatment Assessment:

1) 8; 2) 5; 3) 5, respectively.

Session Thirteen:

Since the previous YTP assessment (especially for the nonsensical speech) did not improve too much, I changed my entire exposure plan under the supervision of my advisors. We decided to target only the "nonsensical speech and screaming" for the in-class in vivo exposure and assigned the other two behaviors as home-base in vivo exposure to the parents in this session. We decided to lower the difficulty level of math problems, add modeling before doing tasks, and stopped doing the fear exposure. We also set up the goal of keeping working on the treatment until all YTP goes to 4 or under, then sustain at 4's (or less) for at least 2 sessions for me to terminate.

In-Class In Vivo Exposure (Child Only):

First, I quickly explained the KICK Plan again for the child. Then I did five simple math problems in front of her with covering my mouth and telling her this meant quiet (no nonsensical speech and no screaming at all). Then I did four simple questions with her while saying "shh" and covering her mouth. For the last part, I asked her to do the simple math problems from her exercise book by herself with no nonsensical speech and no screaming as we practiced previously. There were 40 simple math problems on the book and her mom said they were normal school practice (slightly lower than her ability). I divided the problems into five parts: 3 questions, 5 questions, 7 questions, 10 questions, 15 questions. She could get one smiley face for quietly finishing one part, and total five smiley faces could in exchange for a selected-favored candy. If she failed to collect all five smiley faces, she would not able to get the candy. In this session, she didn't have nonsensical speech and scream at all (see below).

In-class *In Vivo* Exposure

Hierarchy Task Sheet					
Goal	Completion State (Part 1)	Completion State (Part 1)	Completion State (Part 1)	Completion State (Part 1)	Completion State (Part 1)
Calm Voice	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)

The child successfully collected five Smiley Faces and got a raspberry candy.

Parent Module:

In this session, I briefly reviewed the content of the child module and the changes we made to the treatment. Then I assigned the other two behaviors (hitting herself and twisting body) as home-base in vivo exposure #1 to the parent and asked the parent to record the results using home-base in vivo exposure chart (see below). The parent was told to use the same procedures and reward as I did.

Home-Base *In Vivo* Exposure

Hierarchy Task Sheet						
Goal	Sun	Mon	Tue	Wed	Thu	Fri
Calm Hands Calm Body						

Post-treatment Assessment:

1) 7; 2) 4; 3) 5, respectively.

Session Fourteen:

In-Class In Vivo Exposure (Child Only):

After discussed with my supervisor and the child's mother, we decided to increase the difficulty level of the problems rather than the amount of them since the number doesn't affect her behaviors too much (change only one variable at a time). We also increased the trial number from one trial to three trials. In the first trial, I first did the modeling and did some problems with her. Then I gave her 30 harder math problems and asked her to do calm voice (no nonsensical speech and no screaming). The reward system was the same as last time. She did pretty well in the first trial. In the second trial, I increased the difficulty level a little and the rest was the same. In the third trial, I added calm hands and the rest was the same (see below).

In-class *In Vivo* Exposure

Hierarchy Task Sheet						
	Goal	Completion State (Part 1)	Completion State (Part 2)	Completion State (Part 3)	Completion State (Part 4)	Completion State (Part 5)
Trial One	Calm Voice	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)
Trial Two	Calm Voice	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)
Trial Three	Calm Voice+Calm Hands	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)

The child successfully collected all Smiley Faces and got three raspberry candies.

Parent Module:

In this session, I briefly reviewed the content of the child module and the home-base in vivo exposure #1 (see below). Then I assigned all three behaviors as home-base in vivo exposure #2 to the parent and asked the parent to record the results using home-base in vivo exposure chart. The parent was told to use the same procedures and reward as I did.

Home-Base *In Vivo* Exposure

Hierarchy Task Sheet						
Goal	Sun	Mon	Tue	Wed	Thu	Fri
Calm Hands	Complete (Candy)	Not Complete	Complete (Candy)	Not Complete	Not Complete	Complete (Candy)
Calm Body	Not Complete	Not Complete	Complete (Candy)	Not Complete	Complete (Candy)	Complete (Candy)

Post-treatment Assessment:

1) 6; 2) 2; 3) 4, respectively.

Session Fifteen:

In the first trial, I started with easier math problems and asked the child to do calm voice and calm hands. Other things were the same as last session. She did pretty well in this trial. In the second trial, I increased the difficulty level of the problems and repeated the rest of the process. In the third trial, I added calm body and the rest remained the same (see below).

In-Class *In Vivo* Exposure

Hierarchy Task Sheet						
	Goal	Completion State (Part 1)	Completion State (Part 2)	Completion State (Part 3)	Completion State (Part 4)	Completion State (Part 5)
Trial One	Calm Voice+Calm Hands	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)
Trial Two	Calm Voice+Calm Hands	Complete (Smiley Face)	Not Complete	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)
Trial Three	Calm Voice+Calm Hands+Calm Body	Not Complete	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)	Complete (Smiley Face)

The child successfully collected five Smiley Faces and got a strawberry candy.

Parent Module:

In this session, I briefly reviewed the content of the child module and the home-base in vivo exposure #2 (see below). Then I assigned all three behaviors as home-base in vivo exposure #3 to the parent and asked the parent to record the results using home-base in vivo exposure chart. The parent was told to use the same procedures and reward as I did.

Home-Base *In Vivo* Exposure

Hierarchy Task Sheet							
	Goal	Sun	Mon	Tue	Wed	Thu	Fri
Trial One	Calm Voice+Calm Hands+Calm Body	Not Complete	Not Complete	Not Complete	Not Complete	Complete (Smiley Face)	Complete (Candy)
Trial Two	Calm Voice+Calm Hands+Calm Body	Complete (Smiley Face)	Not Complete	Complete (Smiley Face)	Not Complete	Complete (Smiley Face)	Complete (Smiley Face)
Trial Three	Calm Voice+Calm Hands+Calm Body	Complete (Smiley Face)	Not Complete	Not Complete	Not Complete	Complete (Smiley Face)	Complete (Smiley Face)

Post-treatment Assessment:

1) 5; 2) 2; 3) 4, respectively.

Session Sixteen:

The score of number 2 and 3 YTP has decreased to 4 and under, so we decided to increase the reward for Calm voice to refrain from nonsensical speech. Started from this session, we did all three behaviors together both in class and at home. The new reward system will be two flowers for calm voice and one smiley face for calm hands and calm body. Successfully collect 10 flowers could in exchange for five minutes cartoon-watching time. Successfully collect five smiley faces could in exchange for a selected flavored candy as usual.

In-Class In Vivo Exposure (Child Only):

In the first trial, the child did not do well. In the second trial, I slightly decreased the difficulty level of the math problems and everything stayed the same. She did well in this trial. In the third trial, I increased the difficulty level and everything was the same. She did well, too (see below).

In-Class *In Vivo* Exposure

Hierarchy Task Sheet						
	Goal	Completion State (Part 1)	Completion State (Part 2)	Completion State (Part 3)	Completion State (Part 4)	Completion State (Part 5)
Trial One	Calm Voice+Calm Hands	Complete (Flowers+Smiley Face)	Complete (Flowers+Smiley Face)	Not Complete	Not Complete	Not Complete (Only Smiley Face)
Trial Two	Calm Voice+Calm Hands	Complete (Flowers+Smiley Face)	Complete (Flowers+Smiley Face)	Complete (Flowers+Smiley Face)	Complete (Flowers+Smiley Face)	Complete (Flowers+Smiley Face)
Trial Three	Calm Voice+Calm Hands+Calm Body	Complete (Flowers+Smiley Face)	Complete (Flowers+Smiley Face)	Complete (Flowers+Smiley Face)	Complete (Flowers+Smiley Face)	Complete (Flowers+Smiley Face)

Parent Module:

In this session, I briefly reviewed the content of the child module and the home-base in vivo exposure #3 (see below). Then I assigned all three behaviors as home-base in vivo exposure #4 to the parent and asked the parent to record the results using home-base in vivo exposure chart. The parent was told to use the same procedures and reward as I did.

Home-Base *In Vivo* Exposure

Hierarchy Task Sheet							
	Goal	Sun	Mon	Tue	Wed	Thu	Fri
Trial One	Calm Voice+Calm Hands+Calm Body	Complete (Cartoon +Candy)	Complete (Cartoon +Candy)	Complete (Cartoon +Candy)	Complete (Cartoon +Candy)	Not Complete	Complete (Cartoon+ Candy)
Trial Two	Calm Voice+Calm Hands+Calm Body	Complete (Cartoon +Candy)	Complete (Cartoon +Candy)	Not Complete	Complete (Cartoon +Candy)	Not Complete	Complete (Cartoon+ Candy)
Trial Three	Calm Voice+Calm Hands+Calm Body	Complete (Cartoon +Candy)	Complete (Cartoon +Candy)	Not Complete	Complete (Cartoon +Candy)	Complete (Cartoon+ Candy)	Complete (Cartoon+ Candy)

Post-treatment Assessment:

1) 4; 2) 1; 3) 3, respectively.

Session Seventeen and Session Eighteen:

Since all YTPs has decreased to 4 and under, we repeated the procedure for two more sessions to sustain the results. We used the same procedures and rewards, only increased the difficulty level of math problems a little for each trial.

Post-treatment Assessment:

1) 4; 2) 1; 3) 3, respectively.

1) 4; 2) 1; 3) 3, respectively.

Session Nineteen:

This is the last session of BIACA program.

Child Module:

In this session, the child and I celebrated her achievement during this treatment program together. We reviewed all her homework and reward chart. I also encouraged her to keeping practicing the "KICK" plan when encounter anxious situations.

With Parents and Child Together:

We first briefly reviewed the home-base in vivo exposure from last week. Then we reviewed the child's progress with the parent. At last, we gave a Certificate of Accomplishment to the child.

Parent Module:

In this session, we reviewed the progress of the child and made future plans together. The parent was encouraged to continue using the techniques and skills been taught during the treatment program and contact me if there were any problems.

Post-treatment Assessment:

1) 4; 2) 0; 3) 3, respectively.

See below for a review of YTP from all sessions.

YTP Scores from All Sesions

Session No.	Pre-Tretment YTP Score			Post-Treatment YTP Score		
	Behavior 1	Behavior 2	Behavior 3	Behavior 1	Behavior 2	Behavior 3
1	8	6	7	8	6	7
2	N/A	N/A	N/A	8	6	7
3	N/A	N/A	N/A	8	6	7
4	N/A	N/A	N/A	8	6	7
5	N/A	N/A	N/A	8	6	7
6	N/A	N/A	N/A	8	6	7
7	N/A	N/A	N/A	8	6	6
8	N/A	N/A	N/A	8	6	6
9	N/A	N/A	N/A	8	6	6
10	N/A	N/A	N/A	8	6	6
11	N/A	N/A	N/A	8	5	6
12	N/A	N/A	N/A	8	5	5
13	N/A	N/A	N/A	7	4	5
14	N/A	N/A	N/A	6	2	4
15	N/A	N/A	N/A	5	2	4
16	N/A	N/A	N/A	4	1	3
17	N/A	N/A	N/A	4	1	3
18	N/A	N/A	N/A	4	1	3
19	N/A	N/A	N/A	4	0	3

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