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SMART TECHNOLOGY**

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SCHOOL-BASED TREATMENT OF ANXIETY AMONG YOUTH VIA SMART
TECHNOLOGY

A dissertation submitted in partial fulfillment

of the requirements for the degree of

DOCTOR OF PSYCHOLOGY

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New York

by

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ABSTRACT

SCHOOL-BASED TREATMENT OF ANXIETY AMONG YOUTH VIA SMART TECHNOLOGY

Michelle L. Thirkield

Cognitive Behavioral Therapy (CBT) is an effective treatment for youth experiencing anxiety. While various group-based CBT programs have demonstrated effectiveness for anxious youth, few have integrated SMART technology into service delivery to increase engagement and active learning. The On Second Thought (OST) program is a social-emotional learning curriculum grounded in CBT principles. The program aims to teach youth about the relationship between their thoughts, feelings, and behaviors in an innovative and captivating manner via SMART technology. This program has demonstrated preliminary effectiveness in treating anxiety in a clinical setting and anger in a school setting in prior research. This investigation assessed the effectiveness of the OST program implemented in a school-based setting for anxious youth. Eight participants participated in the entirety of the group intervention. The program was delivered by the principal investigator and a school psychologist in a classroom afterschool in a large Metropolitan area. It was hypothesized that participants would demonstrate significant reductions in anxiety symptoms, negative self-statements, and irrational beliefs, and would maintain these gains at 6-week follow-up. The pattern of results obtained in the present study are consistent with previous literature. The OST program appears to be effective in reducing anxiety symptoms within the school-based settings for anxious youth. On self-report anxiety measures, 60% of participants with

elevated pre-treatment ratings demonstrated a reliable decrease in anxiety scores. Beyond statistical significance, clinically meaningful change was observed for 80% of participants. On parent-reported measures, more than 80% of parents reported positive reliable change in anxiety symptoms. Further, more than 80% of parent reports suggested clinically meaningful change. Collectively, these results provide support for the OST program within a school-based setting.

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Literature Review

Anxiety among Youth

Anxiety disorders represent one of the most common mental health problems diagnosed amongst children and adolescents (herein “youths”; Polanczyk et al., 2015). In one meta-analysis evaluating 41 studies spanning 27 countries, Polanczyk et al. (2015), estimated the worldwide prevalence of youth anxiety disorders to be 6.5%.

Epidemiological studies have found lifetime prevalence rates of clinical anxiety amongst youths ranging from 7.1% (Ghandour et al., 2019) to 20% (Beesdo et al., 2009). While prevalence rates vary considerably by study, these findings collectively highlight the pervasiveness of anxiety disorders within youth populations worldwide.

The Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association [APA], 2013) characterizes anxiety disorders as persistent and excessive fear or worry that leads to significant distress and functional impairment (APA, 2013). Though some degree of fear or anxiety in youth is considered to be developmentally appropriate (APA, 2013; Beesdo et al., 2009), a clinical threshold is reached when the fear or anxiety is persistent, typically lasting 6 months or more, and leads to significant impairment (APA, 2013). As a group, anxiety disorders represent a range of pathology, with each subtype entailing varying disorder-specific features and developmental trajectories (De Lijster et al., 2017). Anxiety is reportedly the earliest mental health disorder to emerge in childhood, with 50% of adolescents affected reporting an onset by age 6 (Merikangas et al., 2010). De Lijster et al. (2017) estimated that Separation Anxiety Disorder, Specific Phobia, and Social Anxiety Disorder (Social Phobia) have a mean age of onset before 15 years of age. Further, research has also found

that Generalized Anxiety Disorder is commonly diagnosed within child and adolescent populations (Mohatt et al., 2014). Given the early onset of these disorders, early identification and intervention are important to minimize the risks associated with untreated anxiety.

The impairments associated with clinical anxiety among youth can be substantial and expansive. These individuals are at an increased risk for academic, behavioral, sleep, and social problems throughout their childhood and adolescence (Mychailyszyn et al., 2010; Peterman et al., 2016; Swan & Kendall, 2016). Anxious youth often report having fewer friends compared to their non-anxious peers and are more likely to experience victimization (Crawford & Manassis, 2011; Rodebaugh et al., 2014). The experience of anxiety among youth has also been linked to suicidal ideation, even when controlling for comorbid depressive disorders (O'Neil et al., 2012). Lastly, higher rates of substance use amongst adolescents with anxiety disorders has also been reported (Lemyre et al., 2018).

Left untreated, these individuals are at risk for a broad range of negative outcomes in adulthood. Research suggests that youth onset anxiety disorders have been linked to adult psychopathology including Major Depressive Disorder, Substance and Alcohol Use/Dependence, and anxiety disorders (Cresswell et al., 2014; Essau et al., 2015). In a 16-year longitudinal study exploring the association between age of onset and adult psychosocial functioning, Essau et al. (2014) found that adolescent anxiety disorders predicted lower income, higher rates of unemployment, poorer adjustment, and chronic stress. Further, childhood anxiety disorders have been linked to health and interpersonal problems in young adulthood (Copeland et al., 2013). Beyond these psychosocial and occupational factors, anxiety disorders pose a significant economic burden to society. In

2013, the estimated annual healthcare expenditure in the United States associated with adult anxiety disorders was \$33.71 billion U.S. dollars (Shirmeshan, 2013). Left untreated, anxiety disorders can have considerable adverse consequences in adulthood.

Cognitive-Behavioral Therapy for Anxious Youth

Cognitive Behavioral Therapy (CBT) is a well-established, empirically supported intervention for youth anxiety disorders (Hollon & Beck, 2013; Reynolds et al., 2012) and is often considered a first-line treatment given its robust evidence base (American Academy of Child & Adolescent Psychiatry, 2007). Components of CBT typically include psychoeducation, affect identification, cognitive restructuring, and homework. Research evaluating components of CBT most critical to outcome suggests that cognitive restructuring is a central element of treatment outcome (Peris et al., 2015).

In a series of pioneering studies, Kendall (1994) and Kendall et al. (1997) first demonstrated the efficacy of CBT with anxious youth. Findings from these studies revealed post-treatment anxiety disorder recovery rates ranging from 64% (Kendall, 1994) to 89% (Kendall et al., 1997), significantly better than participants in the waitlist control condition. More recently, a multitude of randomized controlled trials have provided support for the efficacy of CBT for youth anxiety, with meta-analyses reporting mean recovery rates of approximately 60% (James et al., 2013; Warwick et al., 2017). Though the research literature evaluating CBT for anxious youth is dominated by efficacy trials given their methodological rigor and high internal validity, effectiveness studies have demonstrated similar recovery rates (Lau et al., 2010; Southam- Gerow et al., 2010), providing support for its use within clinical practice.

While a large body of research has documented the efficacy of CBT compared to wait-list controls for youth anxiety, studies exploring the relative efficacy of CBT have also yielded promising outcomes. In one such randomized controlled trial, Walkup et al. (2008) found CBT to be just as efficacious for youth with moderate-to-severe anxiety as psychopharmacotherapy. Results indicated clinician reported improvement rates of 59.7% for the CBT condition and 54.9% for the pharmacotherapy condition following treatment (Walkup et al., 2008). These findings suggest that CBT's efficacy is comparable to other commonly used forms of treatment for anxious youth.

Beyond symptom reduction and diagnostic recovery, other positive outcomes associated with CBT for anxious youth documented throughout the literature include improvements in academic functioning (Nail et al., 2015), parent reported behavior functional (Suveg et al., 2009), and social functioning (Settipani & Kendall, 2013). Long term follows up studies have also revealed treatment gains can be maintained up to 19 years following treatment (Benjamin et al., 2013).

Cognitive-Behavioral Therapy Group Format

Early research exploring the use of CBT with anxious youth predominantly utilized an individual format (Robleck & Piacentini, 2005). However, group-based CBT programs offer a cost-effective and efficient approach to treating anxiety. These formats provide unique opportunities for social support and peer modeling. Like individual CBT, studies evaluating group-based CBT programs have rendered promising results (Mychailyszyn et al., 2012). Several comparative studies have found no significant difference in outcome between group and individual CBT for anxious youth (Liber et al., 2008; Wergeland et al., 2014). In one such randomized controlled trial, Wergeland et al.

(2014) compared the relative effectiveness of individual and group CBT for anxious youth in a community clinic setting. Results indicated no significant difference between groups on diagnostic and symptom measures at post-treatment and one-year follow up time points. While individual CBT allows for more tailored treatment planning, these interventions are often costly and laborious. Group-based formats provide a more efficient and cost-effective means of offering treatment.

Empirically Supported School-Based Practices for Anxiety

Prevalence rates of youth anxiety are alarming; however, research suggests that only one third of these individuals receive treatment (Merikangas et al., 2011). Barriers to care often include lack of knowledge regarding mental health problems, stigma, cost, and travel requirements (Gulliver et al., 2010; Salloum et al., 2016). The majority of youth receiving mental health treatment access such services through the educational sector (Gosch et al., 2012); therefore, schools are well positioned to deliver empirically supported interventions to students who may not otherwise seek treatment.

To address the mental health needs of students, many schools have adopted a multi-tiered system of support (MTSS) which offers an organized way of providing services to students. Within a MTSS framework, social-emotional supports can include universal prevention, targeted prevention, or targeted intervention programs. While universal prevention programs have generally yielded positive student outcomes (Cook et al., 2020), targeted prevention or intervention programs remain suitable for students who require more intensive treatment, such as those at-risk or students with formal diagnoses. Results of several systematic reviews and meta analyses suggests that both school-based universal prevention and targeted prevention programs have demonstrated effectiveness

in anxiety symptom reduction (Ahlen et al., 2015; Fisak et al., 2011; Teubert & Piquart, 2011). In a systematic review of various randomized controlled trials, Neil & Christensen (2009) found that 78% of school-based anxiety prevention and early intervention programs resulted in significant anxiety symptom improvements post-intervention. In a more recent review of school-based anxiety prevention programs, Werner-Seidler et al. (2017) found small effects on anxiety at post-intervention ($g = 0.20$) with gains maintained up to 12 months post-intervention ($g = 0.23$). Further, findings from this study revealed similar effectiveness between universal and targeted anxiety programs (Werner-Seidler et al., 2017).

Although schools provide an ideal avenue to disseminate empirically supported treatments to students, transportability studies of CBT programs for anxiety in schools have only gained popularity in recent years. Though strong empirical support exists for the use of CBT with anxious youth, studies have predominantly evaluated CBT in clinical settings (Ludwig et al., 2015). Thus, less empirical support exists for the use of CBT within schools. However, evidence suggests that school-based prevention programs grounded in CBT have a modest but positive effect on anxiety symptoms overall (Mychailyszyn et al., 2012). Further, meta-analytic reviews of early intervention and targeted school-based CBT programs have similarly revealed small to moderate effect sizes in anxiety symptom reduction (Fisak et al., 2011; Teubert & Piquart, 2011). Several group-based CBT programs for anxiety have received empirical support for use within the school setting including the Cool Kids program (Rapee et al., 2000), the FRIENDS program (Barrett et al., 2000), and the Skills for Academic and Social Success Program (Massia-Warner et al., 1999) (Ludwig et al., 2015). These three programs are

well documented throughout the literature and have received considerable empirical support. Collectively, transportability studies have rendered support for the use of group-based CBT programs within schools. However, to date, the research literature evaluating the effectiveness of utilizing technology within service delivery for school-based anxiety intervention programs remains limited.

Technology Mediated Interventions among Youth

Over the past decade, there has been a steady increase in the accessibility and usage of technology amongst youth (Madden et al., 2013). As a result, researchers and mental health clinicians have begun incorporating this medium in practice as a means to access and engage this population while providing treatment (Friedberg et al., 2014). Throughout the research literature, electronic CBT (eCBT) is an umbrella term that encompasses varying modes and degrees of technology usage within interventions. These can include online self-help, therapist-supported computerized or internet delivered CBT, smartphone applications, or traditional CBT delivered via video conferencing (Wolters et al., 2017). Proponents of eCBT posit that CBT is a suitable fit for technology-mediated or delivered use given its structured format and sequential progression (Podina et al., 2015). Further, utilizing technology within treatment protocols may help to improve standardization (Berry & Lai, 2014) and increase engagement and motivation in the therapeutic process (Miller et al., 2012).

While the literature on eCBT for anxious youth is still emerging, results thus far have generally yielded positive results. Several meta-analyses evaluating the efficacy of technology-delivered or mediated CBT for anxious youth have found significant reductions in anxiety symptoms compared to waitlist controls (Pennant et al., 2015;

Podina et al., 2016; Rooksby et al., 2015). Though a variety of eCBT programs for anxious youth have been developed and evaluated, the present study sought to examine the literature on computer-assisted CBT programs or programs that integrate technology into in-person service delivery, with some degree of therapist-directed support.

Throughout the research literature, the Camp Cope-a-Lot program (CCAL; Kendall and Khanna, 2008) has received the most substantial empirical support in the area of computer-assisted CBT for pediatric anxiety. This 12-module program is an extension of the Coping Cat program (Kendall & Hedkte, 2006). Early research of the CCAL program examined the relative efficacy of the intervention compared to traditional in-person CBT (Khanna & Kendall, 2010). Those in both the Coping Cat and CCAL condition showed significant improvements in anxiety symptoms and global functioning, with 81% of participants in the CCAL program group no longer meeting criteria for their principal anxiety disorder. In addition to diagnostic outcomes, participants in the CCAL group rated the treatment to be “acceptable” overall, providing support for the acceptability of the computer-mediated program. More recently, findings from several studies have similarly found significant improvements in anxiety symptom reduction following the intervention in community mental health settings (Crawford et al., 2013; Storch et al., 2015).

Two other programs that have received preliminary support for school-age youth with anxiety include the BRAVE program (March et al., 2009) and the computerized version of the Think-Feel-Do program (Stallard et al., 2011). The BRAVE program, later adapted to a fully online version titled the BRAVE Online program, was first evaluated in a hybrid format, with five sessions occurring online and five sessions conducted in person

in a group format (Spence et al., 2006). In a relative efficacy study, Spence et al. (2006) found no significant difference between the groups participating fully in person as compared to the hybrid model in diagnostic recovery. Further, the Think-Feel-Do program is a six-session computer delivered program based on the Think Good – Feel Good CBT workbook (Stallard, 2004). The program is designed to be facilitated by a professional who is present throughout delivery of the program to reinforce concepts and clarify any misunderstandings (Stallard et al., 2011). While only one published evaluation of this program exists within the literature, findings revealed significant improvements in parent-reported emotional functioning and cognitive schemas for those who partook in the program (Stallard et al., 2011). Notably, feedback about the program suggested that participants generally felt that it was helpful to have a facilitator present during sessions.

While research continues to emerge supporting the use eCBT for anxious youth, research specifically exploring the use of interactive technology within face-to-face service delivery is sparse. Collectively, the literature suggests that the inclusion of technology within service delivery is acceptable and efficacious. However, to the author's knowledge, no program has incorporated interactive technology into in-person school-based group interventions as a means to enhance program delivery.

The Use of SMART Technology with Youth

One technological tool used commonly within the educational sector to provide interactive learning is SMART Boards, a brand of interactive whiteboards (SMART Technologies, 2020). This media-rich instructional tool is a large display that projects multimedia content. Further, the SMART board allows users to interact with the display, dragging and selecting content, supporting an active approach to learning. Active

learning approaches require students to be cognitively engaged in the learning process. Research suggests that students retain more information and perform better when they are actively engaged in educational material (Deslauriers et al., 2011; Deslauries et al. 2019; Freeman et al., 2014) as compared to passively engaged. The SMART board offers students the opportunity to actively participate with learning materials in a hands-on manner.

Further, this instructional tool can be used for game-based learning or integrating games into the curriculum to increase content acquisition (Tivener & Hetzler, 2015). Game-based learning has been described as game content and game play intend to enhance skill acquisition and knowledge (Kirriemuir & McFarlane, 2004; Prensky, 2001). Research suggests utilizing electronic-based games within the school setting can improve elementary students' attitude towards material and lead to increased mastery of content (Partovi & Razavi, 2019). Further, survey research suggests that students generally have a positive attitude toward the use of this interactive technology within the classroom setting (Johnson & Türel, 2012). In an evaluation of students' perceptions of SMART board usage, Manny-Ikan et al. (2011) found that students reported increased motivation and engagement in learning when their teachers utilized SMART technologies.

SMART Boards are currently used in more than 3 million classrooms worldwide (SMART Technologies, 2020). Given their widespread usage, these platforms provide a favorable means to provide social-emotional learning content in an engaging and innovative manner. To the author's knowledge, no published research to date has

evaluated the effectiveness of a social-emotional learning curriculum delivered via SMART technology.

The “On Second Thought: From Iffy to Witty Thoughts” (OST) program is a SMART Board mediated social-emotional learning curriculum grounded in CBT and REBT principles (Busto & Busto, 2014). The OST program can be described as a transdiagnostic psychoeducational program. Like other transdiagnostic programs, OST’s content is intended to target common underlying mechanisms that are present across various symptoms and disorders. Results from prior research suggest that transdiagnostic prevention and intervention programs are effective in treating internalizing disorders in children (Loevaas et al., 2020).

Throughout the nineteen sequential activities taught across eight 45-minute sessions, students are provided with psychoeducation on the cognitive model, taught affect identification, and learn to identify various negative automatic thoughts and irrational beliefs, labeled by the program as “iffy thoughts” in a group setting. Students further learn to identify more adaptive, “witty thoughts” and engage in cognitive reappraisal. The program requires a high degree of student involvement and utilizes a game-based learning approach.

Several studies have investigated the effectiveness of the program in youth within both clinical and school settings. Results of a single-subject case design evaluating the program in a clinical setting provided preliminary support for its use with anxious youth (Schwartz, 2017). Key findings from this evaluation included reductions in anxiety symptoms and negative automatic thoughts post-intervention for the two participants who participated in the study. Beyond symptom reduction, Schwartz (2017) also evaluated

program satisfaction. Both participants endorsed believing that the OST program was helpful, effective at changing their problems, and would likely be helpful to other children with similar difficulties. Additionally, Pata and colleagues (Pata et al., 2018) similarly evaluated the program's effectiveness in a clinical setting in a small group format. Results revealed that two out of four children who participated in the study and completed measures demonstrated a reliable decrease in anxiety symptoms from pre to post intervention according to parent reports. Further, on self-report measures, 25% of children demonstrated a reliable decrease in anxiety symptoms. More recently, Rumie (2022) evaluated the program's effectiveness in reducing anger in a school setting. Findings revealed that 75% of children demonstrated a reliable decrease in self-reported anger following the intervention. Collectively, these findings provide preliminary support for the use of the OST program within both school and clinical settings.

Evaluating Treatment Effectiveness

The vast majority of research to assess effectiveness of treatments utilizes group-level mean change (Zuidersma et al., 2020). This method has various advantages, such as the ability to evaluate effect sizes within a large group and strong external validity (Cooper et al., 2007). While such methods do allow researchers to determine if group-level score changes are statistically significant, clinicians are more often concerned with intra-individual meaningful change. Rather than asking if the change is statistically significant for most people receiving an intervention, the questions we often wish to answer are as follows: 1) Is the change meaningful? 2) Is the change reliable?

Single-case designs provide a meaningful method for evaluating change across treatment in a more individualized manner (Smith, 2012). While RCTs are considered the

gold standard of evaluating treatment effectiveness due to their ability to study causal relationships and reduce bias (Hariton & Locascio, 2018), using single-case designs have various advantages within psychological research. Single-case methods provide an estimate of relative change across treatment while controlling for test reliability, which is often not captured within group-level analyses (Duff, 2012). Further, these methods can play a key role in earlier stages of intervention development and testing as well as latter stages, such as evaluating generalizability and transportability of treatment (Gallo et al., 2013). Despite these two methods at times appearing at odds, they can be thought of as complementary methods to investigate treatment effectiveness, both with their own strengths.

The Present Study

The present study sought to investigate the effectiveness of the “On Second Thought: From Iffy to Witty Thoughts” (OST) program (Busto & Busto, 2014) in reducing anxiety symptoms within a school setting. Research continues to emerge supporting CBT for youth with anxiety in schools; however, the OST program is unique in its integration of SMART technologies into service delivery.

Based on the reviewed literature, this study hypothesized that youth who participate in the OST program will demonstrate the following:

- 1) Significant reductions in anxiety symptoms, as indicated by self and parent-report total scores.
- 2) Significant reductions in negative self-statements and significant reductions in endorsement of irrational statements.
- 3) Maintenance of gains, as measured by a comparison of the MASC-2 self-report total scores, MASC-2 parent-report total scores, CATS, and CASI-3 scores at three weeks pre-intervention, the end of the final session, and 6-week follow-up.

Methodology

Participants and Procedures

The present study utilized data collected in the Spring of 2019. Approval from the authors' institutional review board (IRB) was obtained prior to the commencement of data collection. Participants were recruited through convenience sampling, using a recruitment flyer sent via email or provided in-person at a private elementary school in a suburban metropolitan area (see Appendix A). The flyer advertised a free social-emotional learning program for children exhibiting anxiety. The flyer instructed interested parents or caregivers to contact the principal investigator by email.

Following the receipt of an email expressing interest, the researchers conducted telephone screenings with parents to determine student eligibility (see Appendix D). To be considered eligible, parents had to report that the child was between the ages of 8 and 11 and was currently experiencing symptoms of anxiety, as rated on a severity scale of at least a five on a scale from one to ten. Following an endorsement of five or higher on this single-item, participants and their parents were administered the MASC-2. Inclusion criteria required one elevated subscale or total score on the MASC-2 self-report or parent report. Those who were actively receiving psychotherapy or psychopharmacology for the treatment of anxiety were excluded from participating in the study. Further, students with a reported learning disability were also deemed ineligible for the study in an attempt to increase homogeneity within the sample. If participants met the inclusion criteria, the researchers provided consent/assent forms (see Appendix E/F) and pre-intervention measures to administrative staff to be distributed to select families at the school. The consent form detailed information about the study's purpose, participation requirements,

participation risks/benefits, and the opportunity to opt-out of the study. Further, parents were informed that upon completion of the program, when all measures had been completed and received, they would be eligible to receive a \$50 gift card as a monetary incentive.

In total, nine participants participated in the study. One participant dropped out following session three, and their data was therefore not included. Participants were aged between 8 and 11 years old. 87% of the sample identified as female. The present study required the completion of various outcome measures at three weeks pre-intervention, the final session, and six-weeks follow up. As a result, missing data occurred through lack of measure completion and missing items. Where possible, mean substitutions were utilized to retain as much data as possible. A total of 19% of the data was missing; however, researchers suggest that missing rates between 15-20% are common within the field of psychology (Enders, 2003). Pairwise deletion was used to handle missing data due to the small sample size and the methods preservation of existing data (Kang, 2013). Pairwise deletion does not omit cases completely due to missing data. This method allows subsets of the data to be analyzed and therefore preserves the data more so than listwise deletion (Kang, 2013).

The OST program was delivered for 45 minutes weekly for eight weeks in a group format by the principal investigator, a doctoral candidate in school psychology, as well as a school psychologist who is completing her doctorate. Treatment fidelity was assessed by a faculty member of the school psychology department, using a weekly checklist developed by the researchers (Appendix H). Following the eight-week intervention, participants and parents completed measures again to assess change.

Maintenance of gains was evaluated by follow-up measures completed 6-weeks following intervention. Participants who returned all measures and attend at least seven out of the eight sessions were provided with a \$50 gift card as a monetary incentive.

Measures

Demographics. Prior to intervention implementation, participants' parents completed a brief demographic survey which included questions regarding child's age, gender, grade, and ethnicity.

Anxiety Symptoms. To evaluate anxiety symptoms, The Multidimensional Anxiety Scale for Children, 2nd Edition (MASC-2; March, 2012) self (MASC-2 SR) and parent (MASC 2-PR) rating scales were completed at pre-intervention, post-intervention, and follow-up time points. The MASC-2 has demonstrated adequate reliability (March, 2014) on both parent ($\alpha = .89$) and self-report versions ($\alpha = .92$) and assesses a broad range of symptoms that represent various dimensions of childhood anxiety. The MASC-2 provides users with several subscales which include Separation Anxiety/Phobias, Social Anxiety, Obsessions & Compulsions, Physical Symptoms, Harm Avoidance, and the GAD Index. In addition to these subscales, the MASC-2 provides a total score, which is aggregated using several of the subscales. For the purpose of this study, the MASC-2 total scores were evaluated as part of the hypotheses.

Negative Automatic Thoughts. The Children's Automatic Thought Scale (CATS; Schniering & Rapee, 2002) was completed by participants at pre-intervention, post-intervention, and follow-up time points to evaluate various negative automatic thoughts. Negative automatic thoughts were assessed given findings within the literature that suggests reduction in anxiety symptoms are associated with reduction in negative

automatic thoughts (Muris et al., 2009). The CATS is grounded in Beck's cognitive model and assesses automatic thoughts to understand the cognitive processes associated with a child's emotional disturbance (Schniering & Lyneham, 2007). This 40-item measure has good psychometric properties ($\alpha = .91$) including acceptable test-retest reliability and discriminant validity (Schniering & Rapee, 2002). This instrument provides several subscales including Physical Threat, Social Threat, Personal Failure, and Hostility. The Total score is derived by adding the four subscale scores and was evaluated in the present study.

Irrational Beliefs. The Child and Adolescent Scale of Irrationality, Third Edition (CASI-3; Terjesen et al., 2017) measure was completed by participants at pre-intervention, post-intervention, and follow-up time points to assess dysfunctional and irrational thoughts. This 36-item measure is a psychometrically sound instrument, with research supporting its good reliability ($\alpha = .92$) and validity (Terjesen et al., 2017). The CASI-3 provides users with a Total Irrationality scale as well as subscales including Ratings of Worth, Awfulizing, Low Frustration Tolerance, and Demandingness. Children were asked to express their agreement or disagreement with the items on a 5-point Likert scale, from 1 (strongly disagreement) to 5 (strongly agreement). The CASI-3 Total score was evaluated for change for the purpose of this study.

Intervention

The OST program is a social-emotional learning curriculum developed by Dr. Teresa Busto, largely based on the work of Drs. Aaron Beck, David Burns, and Albert Ellis (Busto & Busto, 2014). The OST program is an interactive curriculum which utilizes SMART technology to teach cognitive-behavioral principles in a child-friendly

manner through the use of colorful illustrations, idiomatic expressions, and engaging activities (Busto & Busto, 2014). Throughout the nineteen sequential activities, students are provided with psychoeducation on the cognitive model, taught affect identification, and learn to identify various negative automatic thoughts and irrational beliefs, labeled by the program as “iffy thoughts.” Some examples of “iffy thoughts” include, “Playing Up”, which intends to represent awfulizing or catastrophizing, and “On Someone’s Back,” which intends to represent demandingness. Later activities utilize cognitive reappraisal strategies to replace “iffy thoughts” with more adaptive, “witty thoughts.” For example, the alternative witty thought to the iffy thought “Playing Up” is “Striking a Balance,” which encourages children to engage in more balanced thinking rather than catastrophizing. See Appendix G for further detail on the OST program’s sequence and the associated CBT principles utilized within each activity. Further, weekly homework assignments reviewed content taught within activities to reinforce content outside of sessions.

Given the OST programs aim to be utilized as a social-emotional learning curriculum, the content addresses a wide range of emotional experiences. The program provides a multitude of examples of various thoughts, emotions, and behaviors that can be applied to an array of experiences. For the purpose of the present study, examples within each activity were selected to reflect the emotional experience of the targeted population (i.e., anxiety). The program requires a high degree of leader involvement given all activities are delivered in-person by the facilitator.

Collectively, results from previous research has provided preliminary support for the use of the OST program amongst youth populations (Pata, et al., 2017; Rumie et al.,

2020; Schwartz, 2017). More specifically, Pata, et al. (2017) and Schwartz (2017), both observed reductions in anxiety symptoms following the intervention in a clinical setting. In the first of its kind, Rumie et al. (2020) provided support for the OST program in a school setting with youth experiencing anger symptomatology.

Treatment Integrity

Given that the OST program is a multi-component program, entailing varying activities and teaching topics, treatment integrity was assessed by an observer during each session to better assess effectiveness. Prior to each session, the researchers identified selected slides from each activity to discuss within session based on targeted population needs (i.e. anxiety-related content). The principal investigator was then provided with the Treatment Integrity Checklist (Appendix H) to complete throughout the session. To improve adherence, a treatment fidelity score was calculated for each session to monitor integrity throughout the intervention. This checklist was then utilized to provide performance feedback and ensure accurate program implementation.

Design

This study applied a quasi-experimental, single-group pretest, posttest, and follow-up design to evaluate the OST program's effect on anxiety symptoms, negative automatic thoughts, and irrational beliefs. This design was a suitable fit for the present study given that it requires fewer resources compared to other types of experimental designs. Further, utilizing such an approach allowed researchers to compare the degree of change occurring at various time points throughout treatment and six-week follow up (Dimotrov & Rumrill, 2003). While findings from a single-group pretest-posttest design cannot determine cause given potential threats to internal validity (Privitera & Ahlgrim-Dezell,

2018), this design does allow for the analysis of within-group statistically significant change. Beyond assessing statistically significant change, other means of assessing treatment effectiveness were used and discussed below.

Results

Statistical Analyses

The present study analyzed the data for both group level and individual change. To assess group-level change, nonparametric statistical analyses were conducted given the small sample size. Nonparametric tests are distribution free and do not assume normality (Krusal & Wallis, 1952), making them a suitable fit for small sample sizes. The Friedman's Test (Friedman, 1937) was utilized to compare the change in scores across variables at pre-intervention, post-intervention, and follow-up time points. This statistical method, considered the non-parametric alternative to the Repeated Measures Analysis of Variance (ANOVA), is appropriate given the study's aim to examine the effectiveness of the OST program on anxiety symptoms, negative automatic thoughts, and irrational beliefs over time (Scheff, 2016). The Friedman test is an analysis of variance by ranks. To compute a Friedman Test, values within each participant are ranked from lowest to highest across time points. The mean ranks across cases are then computed to determine significance. Beyond evaluating the null hypothesis of no significant difference between ranked groups, it is often used prior to pairwise comparisons (Eisinga et al., 2017). Additionally, post hoc tests were used following rejection of the null hypothesis to further evaluate change. That is, if the Friedman's test revealed statistically significant differences, post hoc analyses were applied to evaluate where differences in the data were observed (Pereira et al., 2015). For the purpose of this study, Conover post hoc tests were used to compare the rank sums for multiple comparisons. The data was analyzed using the Statistical Package for Social Sciences (SPSS). An alpha value (α) of .05 was utilized (level of significance).

Additionally, single-subject design was also used to evaluate change in scores across individuals. The Reliable Change Index (RCI) was computed to determine whether statistically significant change occurred within individual participants from pre-treatment to post-treatment and pre-treatment to follow-up. According to Jacobson and Truax (1991), reliable change can be thought of as the extent to which change in an individual's score falls beyond the range which can be attributed to the standard error of the measure. The RCI is computed by dividing the difference between pretreatment and post treatment scores by the standard error of the difference between the scores. An RCI critical value of 1.96 ($p < .05$) is used to determine significant change (Jacobson & Traux, 1991).

First, the standard error of measurement (SEM) was calculated for each outcome variable. In order to calculate the SEM, published norms and test-retest reliabilities of the measures were utilized. This method of computing the SEM is commonly used within the literature when calculating RCI (Jacobson & Traux, 1991). When calculating the RCI for the CASI-3 the internal consistency coefficient was used, as this is the sole reliability statistical reported for the measure (Martinovich et al., 1996). The RCI was calculated for outcome variables that the participant evidenced elevated scores on pre-treatment measures. Further, clinically significant change was determined by examining whether participant's pre-treatment outcome scores moved out of the dysfunctional range (i.e., "clinically significant" or "elevated") and into the functional range (i.e., average) at post-treatment or follow-up time points (Jacobson et al., 1984).

Group-Level Analyses

Self-Reported Anxiety. A Friedman test was carried out to compare the total self-reported anxiety scores on the MASC-2 across the three time points. This method

was used to evaluate if significant reductions in self-reported anxiety symptoms were observed across intervention. A total of six participants' scores were included in the analysis. There was found to be a significant difference between the time points, $\chi^2 (2) = 9.478, p = 0.009$. Conover's post hoc pairwise comparisons revealed significant differences between pre-intervention and post-intervention time points ($T = 2.517, p = 0.031$). No significant difference was observed between post-intervention and follow-up, suggesting maintenance of gains.

Parent-Reported Anxiety. A Friedman test comparing the total parent-reported anxiety scores on the MASC-2 across treatment was also computed. This method was used to evaluate if significant reductions in parent-reported anxiety symptoms were observed across treatment. A total of five participants' scores were included in the analysis. Findings revealed a significant difference between the time points $\chi^2 (2) = 6.421, p = 0.040$. Follow up analyses revealed a significant difference between pre and follow up time points ($T = 2.286, p = .052$). However, parent-reported anxiety scores from pre-intervention and post-intervention were not statistically different ($T = 2.123, p = .067$).

Irrational Beliefs. A Friedman test was carried out to compare the total self-reported irrational beliefs scores on the CASI-3 across the three time points. This statistical technique was used to evaluate if significant reductions in negative self-statements were observed across treatment. There was not found to be a significant difference between the time points, $\chi^2 (2) = .4, p = 0.81873$. These findings were not unexpected, due to the lack of clinically elevated CASI-3 scores across treatment time points.

Automatic Thoughts. Similar to findings evaluating participant's irrational beliefs, results from a Friedman test comparing the self-reported automatic thoughts on the CATS across treatment did not reveal a significant difference between pre, post, and follow-up time points $\chi^2 (2) = 1.6, p = .44933$. While no significant difference was observed, three out of five participants demonstrated a decrease in negative automatic thoughts from pre to post treatment, according to their CATS Total score. Consistent with findings from the CASI-3, elevated ratings on the CATS were not observed across any time point.

Single-Subject Design

Self-Reported Anxiety Symptoms. To evaluate if reliable and significant reductions in self-reported anxiety symptoms were observed, the RCIs were calculated for participants with elevated baseline MASC-2 scores. Of the five participants who reported elevated ratings on the MASC-2 SR Total Score prior to the onset of treatment, two demonstrated reliable change from pre to post-intervention. Further, one participant continued to demonstrate maintained gains as evidenced by their RCI score comparing post-intervention to follow-up. Notably, four out of five participants with elevated ratings at the onset of the intervention moved from the “dysfunctional” range to the “functional” range by the end of the intervention. Lastly, a decreasing trend in scores was observed for six out of eight participants who completed measures at pre and post intervention. See Table 1 for individual participants' scores.

In contrast with our hypothesis that self-reported anxiety would significantly decrease across treatment, two participants demonstrated maladaptive change from pre to post-intervention on the MASC-2 SR Total Score. Despite these unexpected changes in

scores, RCI calculations suggested that neither participant demonstrated reliable change in the undesired direction. Further, one participant's scores continued to reflect average levels of anxiety, as indicated by classification categories.

Parent-Reported Anxiety Symptoms. To evaluate if reliable and significant reductions in parent-reported anxiety symptoms were observed, the RCIs were calculated for participants with elevated baseline MASC-2 scores. On the MASC-2 PR Total Score, six out of seven participants obtained elevated ratings at the onset of treatment. Of these six participants, four demonstrated a reliable decrease in scores from pre to post intervention. Only one participant demonstrated a reliable decrease in scores from post-intervention to follow-up. Further, five out of six participants with elevated ratings at pre-treatment moved from the dysfunctional to functional range by the end of the intervention, demonstrating a decreasing trend in T-Scores. See Table 2 for individual participants' scores.

Irrational Beliefs. On the CASI-3, all baseline scores were suggestive of a rational philosophy or belief system among participants and did not indicate elevated levels of irrationality. Therefore, RCI calculations were not computed, as reliable change would not be expected for non-elevated scores. See Table 3 for individual participants' scores.

Automatic Thoughts. None of the participants' pre-treatment CATS Total scores reflected elevated levels of negative automatic thoughts; therefore, the RCIs were not calculated. Despite the lack of pre-treatment endorsement of negative automatic thoughts, trends in the data were still explored. Three out of five participants demonstrated a decrease in scores across treatment. However, inconsistent with our hypothesis, two

participants demonstrated an increase in self-reported negative automatic thoughts across treatment. However, neither of these scores reflected significantly elevated ratings. See Table 4 for individual participant's scores.

Discussion

Anxiety disorders are one of the most common mental health conditions diagnosed amongst youth (Polanczyk et al., 2015). Despite prevalence rates, access to treatment remains scarce (Merikangas et al., 2011). Schools are an optimal avenue to reach children who may not otherwise seek or receive treatment (Gosch et al., 2012). The literature on treatment for anxiety in youth suggests that both group-based CBT and technology-mediated CBT are efficacious in treating these disorders (Fisak et al., 2011; Pennant et al., 2015). While these areas of research continues to grow, studies exploring the integration of these two subjects remains limited. The current study therefore sought to bridge the gap by exploring the effectiveness of a psychoeducational group CBT program for anxious youth in the school setting.

The purpose of this study was to gain a better understanding of the effectiveness of the OST program amongst anxious youth in a school-based setting. Prior pilot studies of the OST program provided preliminary support for its use in both clinical and school-based settings (Pata et al., 2018; Rumie 2022; Schwartz, 2017). However, the present study is the first of its kind to assess the program's effectiveness amongst school-based youth experiencing anxiety symptoms. Further, the present study included analyses of group-level and individual change across intervention, unlike prior research which has solely used single-subject design to evaluate effectiveness.

The pattern of results obtained in the present study are consistent with previous literature on the OST program. On self-report anxiety measures, 60% of participants with elevated pre-treatment rating demonstrated a reliable decrease in anxiety scores across the intervention. Beyond statistical significance, findings also suggested clinically meaningful change for 80% of participants. On parent-reported measures, more than 80%

of parents reported positive reliable change in anxiety symptoms. Further, more than 80% of parent reports suggested clinically meaningful change. Further, most participants maintained their gains at follow-up. These findings are similar to those observed within the anxiety intervention literature, with mean recovery rates of approximately 60% (James et al., 2013; Warwick et al., 2017). Collectively, these results provide support for the OST program.

In the present study, a hypothesized mediator of treatment effectiveness was participants' endorsement of negative automatic thoughts and irrational beliefs. Based on the documented association between negative automatic thoughts and anxious distress within the literature (Muris et al., 2009) it was unexpected that participants' scores would reflect adaptive cognitive appraisals at baseline. Cognitive-behavioral models place a strong emphasis on the influence of negative cognitive appraisals as a pathogenesis of anxiety disorders (Reedy et al., 2020). In the present study, our access to students with formal diagnoses was limited. Our inclusion criteria required parent or child elevated ratings on anxiety-specific assessments but did not require formal diagnoses or extensive assessment. Though semi-structured interviews are a sound means of identifying anxiety disorders, they often require substantial training and time. As such, this means of assessment and inclusion for the present study was not deemed feasible.

Given that change in cognitive appraisal was not observed as a mediating variable in the present study, it is important to consider other factors that may have influenced change across treatment. The contextual common factors model, developed by Wampold & Imel, (2015), highlights that a variety of factors such as therapeutic alliance, empathy, positive regard, and expectations can facilitate therapeutic change. Future evaluations of

the OST program may wish to explore how these common factors are rated throughout the intervention.

Inclusionary criteria in the present study required elevated ratings on either parent or child reports of anxiety. However, pre-treatment self-reported anxiety scores on the MASC-2 were considered "Clinically Elevated" for only two out of eight participants. Three other participants demonstrated "Slightly Elevated" scores. Though these ratings reflect slightly more anxiety-related symptoms compared to same-age peers, such ratings are not entirely suggestive of disordered levels of anxious distress. Therefore, it is reasonable that baseline ratings on the CASI-3 and CATS were not indicative of distorted, negative cognitive appraisals. As a result, conclusions about the OST program's impact on cognitions across treatment were inconclusive.

Limitations

Despite the significant contribution that this pilot study adds to the literature, it is appropriate and necessary to address several potential limitations. For ethical and practical reasons, the present study is not randomized and does not include a control group. This quasi-experimental pre-post design may have potentially threatened internal validity. Additionally, the present study included only a small number of participants due to sampling methods. Future studies should extend this research by using a randomized control group design. Utilizing such a design would allow for more causal conclusions and control for extraneous variables.

Secondly, OST is a new program. Though it has been evaluated in three prior studies, the program content continues to be adjusted based on implementation feasibility and feedback from the facilitators. As such, some difficulties throughout program

implementation were noted. For example, technology difficulties did impact flow of implementation on several occasions. To address these challenges, difficulties were communicated to the program developer to improve program administration for future studies.

Lastly, the OST program relies heavily on the use of idiomatic expressions to identify negative automatic thoughts and irrational beliefs. While potentially more engaging for children, some difficulties with idiom processing and comprehension were observed during group sessions and warrant further discussion. Within the literature, idiom processing and comprehension is considered to be multi-determined (Titone & Libben, 2014). A plethora of cognitive skills and contextual factors have been described as contributory to the processing and comprehension of these literary expressions. Several of these cognitive skills include theory of mind (Lundbloom & Woods, 2012), semantic analysis (Nippold, 1998), crystallized intelligence, and working memory (Cacciari et al., 2018). Further, not all idioms are created equal. Idioms can vary based on their transparency, literal plausibility, and familiarity (Titone & Connine, 1994; Libben & Titone, 2008; Titone & Libben, 2014). While there is no exact age that idiom comprehension is considered “acquired”, research suggests that typically developing children begin developing the skills necessary for idiom comprehension at approximately age five (Nippold, 1991). These skills continue to develop gradually throughout adolescence. Our observations within the present study were consistent with the literature. While some participants appeared to grasp and recall the idioms with ease, others demonstrated more difficulties, often struggling to recall the figurative

interpretation, even with reteaching. Further research evaluating the OST program may consider exploring how age and language abilities may impact treatment effectiveness.

Future Directions

Various directions for future research emerged from the current investigation. First and foremost, future research should continue to explore the association between negative thought patterns and anxiety symptoms across the OST intervention. The present study did not observe elevated pre-treatment levels of negative cognitive appraisals and these results were therefore inconclusive. Going forward, studies may wish to only include participants with elevated pre-intervention ratings to better assess this potential mediating variable. Secondly, future studies may also wish to explore the impact of cognitive/developmental level and environmental factors, such as dual language exposure, on participants' idiom comprehension. This may entail assessing idiom comprehension using a formalized measure prior to the onset of treatment. Furthermore, the current study relied predominantly on parent and self-report measures to evaluate change. While informative, including teacher reports may also be beneficial in providing a more holistic picture of participant functioning across the OST intervention. Lastly, future research should also consider exploring program satisfaction. Though findings from Schwartz (2017), suggests that the intervention is deemed acceptable and effective by participants in a clinical setting, program satisfaction of school-based implementation warrants further exploration.

Implications for the Profession of School Psychology

The current study lends to the scholarly body of work regarding school-based interventions for emotional difficulties among youth. Schools remain an ideal avenue to address the mental health needs of youth (Ahlen et al., 2015; Cook et al., 2020). At present, various social-emotional learning programs have been developed and evaluated for use in schools and have demonstrated support (CASEL Program Guide, 2013). While a variety of programs have been deemed effective for reducing anxiety symptoms, few have integrated technology into service delivery to increase participation. The OST program relies heavily on active learning, which has been shown to increase engagement, interest, and mastery of content (Deslauriers et al., 2011; Deslauriers et al. 2019; Freeman et al., 2014).

Despite the limitations outlined above, the results obtained in the present study have several theoretical and practical implications. First and foremost, OST appears to be an effective intervention program for use with anxious youth in a school-based setting. Secondly, it appears that the OST program is effective, even when administered in a group-based format. Unlike prior research, the current study included eight participants. Though this may not be considered a large group, prior investigations have solely used the program in groups ranging from two to four participants. Therefore, this investigation provides support for program use in a medium size group format.

Table 1.

MASC-2 SR Total Scores at Pre, Post, and Follow Up

| | Pre-Treatment | Post-Treatment | Follow-Up |
|-------------------|---------------|----------------|-----------|
| Participant One | 46 | 40 | 40 |
| Participant Two | 56 | 48 | 40 |
| Participant Three | 47 | 54 | INC |
| Participant Four | 60* | 54 | 58 |
| Participant Five | 72* | 59 | 52 |
| Participant Six | 61* | 56 | 51 |
| Participant Seven | 65* | 49 | 60 |
| Participant Eight | 61* | 67* | INC |

INC = Measure not completed, or not enough information obtained to calculate scores

* Indicates a MASC-2 SR score in the “Slightly Elevated”, “Elevated”, or “Very Elevated Range”

Table 2.
Parent-Reported MASC-2 Pre, Post, and Follow-Up

| | Pre-Treatment | Post-Treatment | Follow-Up |
|-------------------|---------------|----------------|-----------|
| Participant One | 61* | 54 | 42 |
| Participant Two | 69* | 58 | 47 |
| Participant Three | 57 | 55 | 44 |
| Participant Four | 72* | 40 | 43 |
| Participant Five | 80* | 77* | 80* |
| Participant Six | 64* | 53 | INC |
| Participant Seven | 78* | 53 | INC |
| Participant Eight | 67* | INC | 65* |

INC = Measure not completed, or not enough information obtained to calculate scores

* Indicates a MASC-2 PR score in the “Slightly Elevated”, “Elevated”, or “Very Elevated Range”

Table 3.
CASI-3 Total Scores Pre, Post, and Follow-Up

| | Pre-Treatment | Post-Treatment | Follow-Up |
|-------------------|---------------|----------------|-----------|
| Participant One | 1.78 | 1.64 | 1.67 |
| Participant Two | INC | 2.44 | 2.83 |
| Participant Three | 2.25 | INC | INC |
| Participant Four | 2.36 | 2.42 | 2.78 |
| Participant Five | 2.44 | INC | 2.28 |
| Participant Six | 2.53 | 2.31 | 1.97 |
| Participant Seven | 1.89 | 1.97 | 1.72 |
| Participant Eight | 2.81 | 2.81 | 2.81 |

INC = Measure not completed, or not enough information obtained to calculate scores
 * Indicates a CASI-3 score indicating a “high level of endorsement of irrationality”.

Table 4.
CATS Total Scores at Pre, Post, and Follow-Up

| | Pre-Treatment | Post-Treatment | Follow-Up |
|-------------------|---------------|----------------|-----------|
| Participant One | 10 | 6 | 7 |
| Participant Two | INC | 22 | 26 |
| Participant Three | 5 | 19 | 12 |
| Participant Four | 28 | 16 | 17 |
| Participant Five | INC | 6 | INC |
| Participant Six | 8 | INC | 1 |
| Participant Seven | 29 | 13 | 10 |
| Participant Eight | 47 | 69 | 18 |

INC = Measure not completed, or not enough information obtained to calculate scores

* Indicates a CATS score in the “Clinically Elevated” range

Table 5.
Friedman's Test Mean Ranks for Self-Reported Anxiety

| | Mean Ranking |
|-------------------|--------------|
| Pre-Intervention | 3 |
| Post-Intervention | 1.4 |
| Follow-Up | 1.6 |

Table 6.

Friedman's Test Mean Ranks for Parent-Reported Anxiety

| | Mean Ranking |
|-------------------|--------------|
| Pre-Intervention | 2.9 |
| Post-Intervention | 1.6 |
| Follow-Up | 1.5 |

Table 7.
Reliable Change Index (RCI) Scores MASC-2 SR

| | Calculated with RCI | |
|-------------------|---|-----------------------------------|
| | Pre-Intervention to Post- Intervention | Post-Intervention to Follow-Up |
| Participant One | NC | NC |
| Participant Two | NC | NC |
| Participant Three | NC | NC |
| Participant Four | 1.279 | -.8527 |
| Participant Five | 2.772* | 1.492 |
| Participant Six | 1.066 | 1.065 |
| Participant Seven | 3.411* | -2.345* |
| Participant Eight | -1.279 | INC |

NC = Participant scores not within clinical cutoff range; INC = Not enough completed measures to calculate

RCI* < 1.96, $p < .05$

Table 8.
Reliable Change Index (RCI) Scores on MASC-2 PR

| | Calculated with RCI | |
|-------------------|---|-----------------------------------|
| | Pre-Intervention to Post- Intervention | Post-Intervention to Follow-Up |
| Participant One | 1.871 | 3.208* |
| Participant Two | 2.939* | 2.941* |
| Participant Three | NC | NC |
| Participant Four | 8.552* | -.8020 |
| Participant Five | .802 | -.802 |
| Participant Six | 2.939* | INC |
| Participant Seven | 6.682* | INC |
| Participant Eight | INC | INC |

NC = Participant scores not within clinical cutoff range; INC = Not enough completed measures to calculate

*RCI < 1.96, $p < .05$

Appendix A. Recruitment Flyer

<https://onsecond-thought.com/>

On Second Thought: From Iffy to Witty Thoughts is an interactive learning tool to help kids recognize that their thoughts about a situation affect how they feel and behave.



Kids learn how they think affects
how they feel and behave

This innovative program guides 8-12 year old children, their parents, as well as educators and clinicians through cognitive behavioral techniques. The goals are to provide problem solving skills and effective ways to help kids learn how to think their way to more helpful thoughts.

Appendix B. Principal Letter to Parents

Dear Parents:

Developing students' social emotional skills is an important part of a XXX education. Because of our dedication to this ideal we periodically assist universities with their work in the area.

St. John's University is looking to work with a handful of children in the afterschool program that uses our SMARTBoard technology to teach students how to manage their emotions more effectively.

This program would occur during the after-school program for 8 weeks starting in March from 2:30-3:15. Students, their parents, and their teachers would be asked to complete a few measures before, after, and at one-month after the conclusion of the program.

Attached is a brief introductory flyer from Dr. Terjesen of St. John's University.

If you are interested in discussing the program with Dr. Terjesen and his team, please contact them directly and they will schedule a time to speak further about it by phone.

No specific student results from the research will be shared directly with the school without your permission.

In recognition of their participation, students will be provided with an Amazon gift card by St. John's University.

Sincerely,

XXX

Superintendent of Schools

Appendix C. Recruitment Letter



Does your 5th, 6th, or 7th grade child experience intense feelings of anxiety/worry, anger, or frustration about everyday life events? If you are interested in having your child participate in a social/emotional learning program that incorporates technology, at St. John's University, please contact Dr. Mark Terjesen (please include your phone number) at SJUSMARTboard@gmail.com. You may contact Dr. Terjesen with any questions by email or at (718) 990-5860.

Children who seem appropriate for our study after an initial parent phone screening will be invited to continue the eligibility process with an additional electronic questionnaire. Those who are determined to be eligible for the study and are selected to receive it will receive 8 weeks of the weekly group program. There is NO cost for the groups for all 8 weeks and students who attend all sessions and complete all measures will receive a \$50 AMAZON gift card!

If your child is not determined eligible, we can provide recommendations regarding other options.

Appendix D. Telephone Screening Script

Hello, my name is XXX and I am contacting you regarding the child anger study at our Lady of Victory in Floral Park run by St. John's University.

We will be running a social-emotional learning program geared to teach children about thoughts, feelings, and behaviors, and students will participate in interactive activities using a SMART Board.

To begin determining whether your child is eligible for this study, there are a couple of questions I need answered. Is that okay?

Parent Name:

Child Name:

Phone #:

Email:

Would you describe your child as experiencing mostly Anger or Anxiety? (circle answer)

Anger is characterized by intense emotions and sometimes volatile behavior. Children who experience excessive anger may have difficulty controlling their behavior; they might have temper tantrums, verbally or physical aggression, or pouting and sulking. They lack effective problem-solving skills. Their thoughts and emotions may be difficult for them to identify. They will usually blame others for their misbehavior. They will believe that people's behavior was purposely done to hurt them and believe that they must get their way.

Anxiety involves frequent and intense feelings of worry. Children with anxiety may have excessive, unrealistic fears about day-to-day activities, have "what if" concerns that span into the future, have intense worry about multiple situations, need frequent reassurance and approval, be frequently sad or tearful, complain about physical symptoms (i.e., stomach aches), and be sensitive to critique or failure.

1. Do you believe your child is experiencing anxiety or anger? (*parent must believe child is experiencing anxiety or anger*) _____
2. On a scale from 1-10, if 1 means my child rarely gets nervous/worries or angry and it has **no** impact on his/her social, school and family functioning, and 10 means my child almost always gets nervous/worries OR angry and it has a significant impact on his/her social, school, and family, functioning, what number would your child be from 1-10? _____ (*parent must rate a 5 or more*)
3. How old is your child? (*participant must be 8-11 years old for anxiety and 10-13 years for anger*) _____

4. Does your child take any medication for their mood (anxiety or anger)? (*participant must be medication free*) _____
5. Does your child currently receive any counseling or therapy services specific for their mood? (*participant must not be receiving services*) _____
6. Has your child been diagnosed with a learning disability? (*participant must not be learning disabled*) _____
*if participant meets eligibility based on the above criteria ask,
7. Would your child be available to attend the groups weekly starting on Tuesday March 19th from mid-March through May? (*participant must be available*) _____

If participant meets eligibility, say, “Thank you so much for answering these questions, I am going to send you an email now that includes two links. One link is to a consent letter for you to complete regarding your child’s participation in the research and the other is an assent letter for your child to complete regarding his/her participation in the research. Once you have submitted those two forms, we will review them and with your consent and your child’s assent we will deliver a questionnaire to your child’s school for you and your child to complete to further determine his/her eligibility. The questionnaire takes about 15 minutes to complete and we ask that you return it by Thursday AM Once you have submitted this questionnaire, we will review it and let you know if your child meets eligibility to participate by next Friday.

If participant does not meet eligibility, say, “Thank you so much for answering these questions. I’m sorry to inform you that your child does not meet eligibility for our study, however I would be happy to offer you additional treatment options.”

Treatment options: (1) treatment at the St. John’s Center for Psychological Services (718) 990-1900 or treatment at the Albert Ellis Institute (212) 535-0822.

Appendix E. Assent Forms



Assent Letter

Hello,

My name is Mark Terjesen and I work at St. John's University. I am trying to learn more about the way that a SMART Board program impacts students' moods and thoughts. I would like your help. If you agree to participate, first, you will be given a survey that asks questions about your moods, which will take about 15 minutes to do. Some children will be given more surveys on another day that ask more questions about thoughts, feelings, and behaviors. We will also ask your parent and teacher to fill out some surveys.

If you are chosen to join the SMART Board group it will run for 8 sessions and children in the program will meet one time every week for about 45 minutes. The program teaches about thoughts, feelings, and behaviors using the SMART Board. Similar programs have helped children who feel upset, and we hope that this program will also help you. Sometimes talking about thoughts and feelings can make people feel a little more upset and if this happened to you, the person running the group is there to help. If you agree to join, you will be helping us learn how this SMART Board program impacts children's worries, thoughts, and behaviors.

If you agree to participate only me and the research assistants will know your answers and your name will not be connected to the questions you answer. An exception is if you say that you are being hurt, hurting yourself, or hurting someone else, this information will need to be told to other people. Information from this study will be kept in a locked place in my office for 5 years, at which time it will be destroyed.

Being in this study is up to you, and you may also decide to stop after you start or not answer questions that you don't want to answer. If you decide to join or if you decide to say "no," your choice will not impact you. Your parents have already agreed to allow us to ask you to join, but the choice is yours. If you want to join, answer questions for us, and possibly be chosen to be in SMART Board group, please sign. If you have agreed to participate you will be given a survey with questions about your worries. There are no right or wrong answers.

You can ask any questions by emailing me at terjesem@stjohns.edu call me at (718) 990-5860. Also, please email me if you would like to know more about the results of the study. For questions about your rights as a participant, you may contact the committee which approves research here at St. John's University, called the Human

Subjects Review Board, at (718) 990-1440. You will be given a second copy of this form for you to keep.

Thank you!

Agreement to Participate

I agree to participate in the study described above.

I do not agree to participate in the study described above.

Signature

Date

Appendix F. Consent Form



Dear Parent,

My name is Dr. Mark Terjesen and I am a faculty member and psychologist at St. John's University. We are trying to learn more about how a recently developed social-emotional learning program delivered via a SMART Board impacts students experiencing anger or anxiety. A SMART Board looks like a whiteboard, and functions similarly to a tablet device (i.e., iPad). This study will provide valuable information about whether this program is effective at reducing children's anxiety or anger.

During the telephone screening, you reported that you believe your child is experiencing anxiety or anger. In order to further assess whether your child is experiencing anxiety or anger, we would like your child to complete an additional survey specifically assessing anxiety or anger. Your child's responses to this survey as well as your responses to a demographics form will be used to determine whether your child is eligible for study participation.

Participation in this study is completely voluntary. If you agree to allow your child to participate in this study, he or she will be asked to complete the attached survey (approx. 15 minutes), which assesses anxiety or anger-related symptoms in youth. You will be contacted by phone and told whether your child meets eligibility for participation.

Children who meet criteria will be assigned to the SMARTBoard group. All eligible participants, parents, and teachers will be asked to complete a series of questionnaires before the program, after the 8 week program, and six weeks later. As part of this consent, we are also asking your permission to contact your child's teacher so that he or she may fill out a brief questionnaire regarding your child's academic performance. For each participant who completes and returns all questionnaires they will receive a **\$50 AMAZON gift card**.

The 8-session program will be implemented at OLVS for 45 minutes weekly in a small group. The program will teach children about thoughts, feelings, and behaviors, and students will participate in related interactive activities using the SMART Board. Programs guided by similar principles have demonstrated effectiveness at reducing children's anxiety and we are hopeful that this program will do the same. While unlikely, it is possible that participating in such a program can result in some discomfort and if a child's mood is noticeably enhanced, the clinician will provide appropriate support. Additionally, if you believe your child's mood is heightening during the course of the study we encourage you to contact the clinician. There are no long-term negative consequences that are anticipated as a result of study participation.

Confidentiality of your child’s research records will be strictly maintained by:

- Coding all response forms as numbers and not requiring your child provide his/her name on any questionnaires
- Storing response forms in a secure location separate from consent forms
- Only allowing researchers and psychologists facilitating the study to access the data
- Storing the data in a secure location for a period of 5 years, at which time it will be destroyed

By giving permission for your child to participate if deemed eligible, you will be helping us to understand how an innovative social emotional learning program impacts children’s mood and thoughts. You and your child may choose not to participate or withdraw at any time without penalty. If you would like your child to continue the eligibility process and participate if deemed eligible, please sign this form. If you consent, we will give your child an assent form to sign. If your child agrees to participate, he or she are to be given the additional surveys.

In the event that you need any additional information regarding this research project you may call me at (718) 990-5860 or email me at terjesem@stjohns.edu. Results of the present investigation will be available upon request and all inquiries may be directed to me at the email address above. For questions about you or your child’s rights as a research participant, you may contact the university’s Human Subjects Review Board, St. John’s University. You can contact either committee coordinator Dr. Marie Nitopi at (718) 990-1440 or nitopim@stjohns.edu or the committee chairperson Dr. Raymond DiGiuseppe at digiuser@stjohns.edu.

Sincerely,

Mark D. Terjesen, Ph.D.

Agreement to Participate

[] **I agree** to allow my child, _____ (Name) to participate in the study described above and if selected to receive the social emotional learning program at St. John’s University.

Teacher Name: _____

Teacher Phone Number & Email: _____

[] **I do not agree** to allow my child, _____ (Name) to participate in the study described above.

Signature

Date

Appendix G. Program Content Outline

| | |
|--|--|
| Activity 1: Where do feelings come from? | Affect Identification |
| Activity 2: What's on your mind? | Affect Identification and Psychoeducation |
| Activity 3: How do your thoughts make you feel? | Psychoeducation on the Cognitive Model |
| Activity 4: What do you do with your feelings? | Psychoeducation on the Cognitive Model |
| Activity 5: From thoughts, to feelings, to behaviors | Psychoeducation on the Cognitive Model |
| Activity 6: Behaviors lead to consequences | Psychoeducation on the Cognitive Model |
| Activity 7: Train of Thoughts | Psychoeducation on the Cognitive Model |
| Activity 8: Train of Thought | Psychoeducation on the Cognitive Model |
| Activity 9: Iffy Thoughts | Identifying Irrational Beliefs/Negative Automatic Thoughts |
| Activity 10: Targeting Iffy Thoughts | Identifying and Reinforcing Irrational Beliefs/Negative Automatic Thoughts |
| Activity 11: Searching for Iffy Thoughts | Identifying and Reinforcing Irrational Beliefs/Negative Automatic Thoughts |
| Activity 12: Expanding your View of Iffy Thoughts | Identifying and Reviewing Irrational Beliefs/Negative Automatic Thoughts |
| Activity 13: Witty Thoughts | Identifying Rational Beliefs/Adaptive Automatic Thoughts |
| Activity 14: Targeting Witty Thoughts | Identifying and Reinforcing Rational Beliefs/Adaptive Automatic Thoughts |
| Activity 15: Exploring Witty Thoughts | Identifying and Reinforcing Rational Beliefs/Adaptive Automatic Thoughts |
| Activity 16: Witty Quotes | Identifying and Reinforcing Rational Beliefs/Adaptive Automatic Thoughts |
| Activity 17: Iffy and Witty Thoughts | Cognitive Reappraisal |
| Activity 18: More Iffy and Witty Thoughts | Reinforcing Cognitive Reappraisal |
| Activity 19: Even More Iffy and Witty Thoughts | Reinforcing Cognitive Reappraisal |

Appendix H. Treatment Integrity Data Sheet Example

Treatment Plan for 4/30/2019

(Indicate in the provided space below whether slides were reviewed, along with any comments)

In-Session Plan:

Activity 9: All slides

Activity 10: Slides 1, 16, 19, 32, 34, 36

Activity 11: Slides 1, 3, 5, 21, 29

(Provide Student Guide at the onset of the activity)

Activity 12: Slides 1, 3, 5, 8, 10, 12, 15, 17, 19, 20, 21, 22, 24, 26, 27

(Encourage students to utilize Student Guide throughout activity)

Assigning Homework:

Activity 10: Complete all items

Activity 11: Complete all items

Activity 12: Select 3 items to complete

Appendix I. Mapping Iffy and Witty Thoughts

| Iffy Thought | Negative Automatic Thought/Irrational Belief | Witty Thought | “Am I…” |
|---|---|---|--|
| <i>Play Up</i> | Catastrophizing/ Magnification | <i>Come to One’s Senses</i> | Use my senses to think more clearly about a situation |
| <i>Play Down</i> | Minimization | <i>Come to One’s Senses</i> | Use my senses to think more clearly about a situation |
| <i>Twist Someone’s Words</i> | Minimization | <i>Earn Brownie Points</i> | Give myself credit for my efforts |
| <i>Jump Off the Deep End</i> | Emotional Reasoning | <i>Collect Your Thoughts</i> | Ask myself, “What am I thinking?” |
| <i>Paint Everyone With the Same Brush</i> | All or Nothing Thinking | <i>Go On a Fishing Expedition/Strike a Balance</i> | Believe that more evidence leads to wittier thinking/Use less extreme words |
| <i>Read Someone Like a Book</i> | Mind Reading | <i>Put Yourself in Someone Else’s Shoes</i> | Ask myself what someone else might think about a situation |
| <i>The Handwriting is On the Wall</i> | Fortune Telling/ Catastrophizing | <i>Tip the Scales/Go on a Fishing Expedition</i> | Believe that my behavior influences the outcome/Believe that more evidence leads to wittier thinking |
| <i>One Track Mind</i> | Perseveration/Rumination | <i>Come to One’s Senses/ Tip the Scales/ Go On a Fishing Expedition</i> | Use my senses to think more clearly about a situation/Believe that my behavior influences the outcome/Believe that more evidence leads to wittier thinking |
| <i>Do a 180</i> | All or Nothing Thinking | <i>Strike a Balance</i> | Use less extreme words |
| <i>On Someone’s Back</i> | Demandingness | <i>Cut Someone Some Slack</i> | Use less demanding words such as maybe and perhaps |
| <i>Lumping Everyone Together</i> | Ratings of Worth/ Labeling | <i>Burning Questions/Come to One’s Senses</i> | Ask the questions, who, what, when and where to determine why/Use my senses to think more clearly about a situation |
| <i>Pass the Buck</i> | Blaming | <i>It Takes Two to Tango</i> | Believe that in any given situation, at least 2 people share responsibility |
| <i>Left Holding the Bag</i> | Personalization | <i>It Takes Two to Tango</i> | Believe that in any given situation, at least 2 people share responsibility |

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