

Effectiveness and Key Components of School-Based Anxiety Interventions

A Dissertation
SUBMITTED TO FACULTY OF THE
UNIVERSITY OF MINNESOTA
BY

Victoria A. Erhardt

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Faith G. Miller, Advisor

May 2019

Acknowledgements

This dissertation would not have been completed without the guidance, encouragement, and support from many individuals throughout the process. Dr. Faith Miller, my advisor, helped me develop interest and navigate through a new and exciting research field. She encouraged me to dig deeper, problem solve, and think critically throughout the planning, implementation, and writing processes. During my time as a graduate student, Faith has exemplified the scientist-practitioner model and helped shape me into the school psychologist and researcher that I am today. I would also like to thank the other faculty who served on my dissertation committee. Dr. Amanda Sullivan challenged me to design and deliver a rigorous and meaningful project to inform and advance the research field. Dr. Clayton Cook provided an application lens to my work, encouraging me to expand my thinking and reminding me to connect my work with practice. Dr. Amy Susman-Stillman served as one of the first mentors for me as a researcher in graduate school and has continued to inspire me to learn more and consider varied perspectives. In addition to faculty support, fellow graduate students Chloe Webb and Steph Brunner helped me work through challenging issues and answer questions pertaining to my project, and both were integral in helping me maintain stamina and persistence throughout the writing and revising processes. I would also like to thank the area education agency and local school district for allowing my research to be implemented with students and providing me the latitude to pursue my dissertation project while working full-time.

To my family and friends who have been by my side through the entire dissertation project, I sincerely and deeply thank you. I would like to thank my parents,

Sam and Jan, for instilling in me the importance of education and lifelong learning, modeling an ethic of hard work and persistence, and fueling my passion for work in the helping profession. I would like to thank my sister, Samantha, for her fervent belief in my ability to succeed and her constant motivation and encouragement. To my family, I acknowledge and greatly appreciate your unwavering support and patience as I navigated through my dissertation project. I would also like to thank my longtime friend, Jen, for her interest in my research and lending me perspective and optimism when I needed it. I would like to thank my close friend, Keith, for his constant support, guidance, and understanding in the dissertation process; our dissertation conversations enriched my thinking and helped me reach higher.

Table of Contents

Acknowledgements.....	i
List of Tables	v
List of Figures	vi
CHAPTER 1 – General Introduction.....	1
Anxiety Concerns in Youth.....	3
Need for Anxiety Identification and Services	4
State of School-Based Intervention Efforts for Anxiety	5
Gaps in Knowledge.....	7
Project Purpose.....	8
CHAPTER 2 – Study 1	10
Cognitive Behavioral Therapy and Interventions	13
Approaches to Treatment	14
Previous Systematic Review	15
Purpose and Research Questions.....	17
Method.....	18
Literature Search Strategy	18
Screening and Inclusion Criteria.....	19
Data Extraction.....	20
Additional Coding	21
Inter-Rater Agreement.....	22
Effect Size Calculations	23
Evaluation of Publication Bias	23
Results	24
General Characteristics	25
Study Quality	29
Program Content	29
Program Intensity	30
Participant Age.....	31
Intervention Effects on Anxiety	31
Failsafe N Results	32
Neil and Christensen Comparison.....	33
Discussion.....	35
Effectiveness of School-Based Anxiety Programs.....	35
Composition of School-Based Anxiety Programs.....	37
Program Dosage and Intensity	39
Developmental Considerations	40
Comparison with Neil and Christenson	41
Limitations	41
Implications for Future Research	43
Conclusion.....	45
CHAPTER 3 – Study 2.....	58
CBT-Based Anxiety Programs in Schools	60

	iv
Common Elements Approach	62
Think Good Feel Good Program	63
Research Gaps	65
Purpose and Research Questions	67
Method	68
Setting	68
Participants	68
Measures	69
Intervention Program	75
Procedures	75
Design and Conditions	77
Analysis Plan	79
Results	80
Pre/Post Intervention Data	80
Progress Monitoring Data	81
Social Validity Data	90
Discussion	90
Study Strengths	94
Limitations and Future Research	95
Implications for Practice	98
Conclusion	99
CHAPTER 4 - Synthesis and General Discussion	112
Study 1 Key Findings	113
Study 2 Key Findings	114
Recommendations for Addressing Youth Anxiety in Schools	115
Implications for Practice	116
Future Research Directions	118
Conclusion	120
References	121
Appendix	141

List of Tables

STUDY 1

Table 1: CBT Component Definitions Adapted from Velting, Setzer, and Albano (2004)	47
Table 2: Program and Study Details for School-Based Anxiety Interventions	48
Table 3: Trials with Significant Intervention Effects and Effect Sizes in the Moderate Range	54
Table 4: Neil and Christensen (2009) Trials with Significant Intervention Effects and Effect Sizes in the Moderate Range	55

STUDY 2

Table 1: Participant Demographics (N = 14)	101
Table 2: Think Good Feel Good (TGFG) Intervention Session Plan and Lesson Components	102
Table 3: Pre and Post MASC-2 and TRF-A Data by Self, Parent, and Teacher Report (N=11)	104
Table 4: SUDS Mean Scores by Intervention Phase (N =11)	105
Table 5: τ_{novlap} Effect Size Estimates for SUDS by Intervention Phase (N = 11)	106
Table 6: DBR-A Mean Scores by Intervention Phase (N =11)	107
Table 7: Social Validity Self-Report Ratings (N =11)	108

List of Figures

STUDY 1

Figure 1: A PRISMA flow diagram describing the sequence of steps involved in the selection of studies57

STUDY 2

Figure 1: Fifth Grade Individual SUDS Data109

Figure 2: Fourth Grade Individual SUDS Data110

Figure 3: Third Grade Individual SUDS Data111

CHAPTER 1

General Introduction

In previous decades, schools were recognized as de facto providers for mental health services and supports (Doll & Cummings, 2008) and have become a major and common mental health service setting (U.S. Department of Health and Human Services, 1999). While schools have traditionally focused on academics and learning, their role has widened to accommodate much needed services to address student mental health concerns. This shift is further propelled in part by the inclusion of a school-based mental health services provision that incorporates these services into learning supports via the Every Student Succeeds Act (2015). Schools are uniquely positioned to deliver mental health services and serve as optimal settings for their implementation, due to the familiarity of the school setting, increased access to care, and greater ability to assess and monitor student behavior and functioning (Taras, 2004). Schools can aid in mental health prevention and intervention efforts by providing opportunities to reach students who may suffer from internalizing concerns and providing identification and treatment that is often not accessed outside of school (Huberty, 2014).

Despite the substantial progress that has been made with regard to the provision of school mental health services, questions remain about how to best serve and treat students with mental health concerns, particularly those with internalizing problems. There are needs for further research on different treatment approaches, formative assessment data collection, intervention dosage and intensity, and program content components to determine what may work best and for whom in schools. The purpose of this project was to synthesize existing research literature on school-based anxiety programs and use these findings to help design and implement an anxiety intervention with students in an elementary school setting.

Anxiety Concerns in Youth

Anxiety disorders are widely cited as the most common set of mental health disorders faced in childhood and adolescence (Beesdo, Knappe, & Pine, 2009). While some anxiety is considered typical and even adaptive at times, anxiety is often deemed pathological when it is “characterized by persisting or extensive degrees of anxiety and avoidance associated with subjective distress or impairment” (Beesdo et al., 2009, p. 2). Common anxiety disorders that emerge in childhood and adolescence include separation anxiety disorder, specific phobia, and social anxiety disorder (Weis, 2014). Anxiety disorders affect children from a young age, with one large nationally representative study finding that the majority of adolescents with anxiety disorders had onset by the age of six (Merikangas et al., 2010). This suggests that many children may struggle with anxiety when first entering school. Prevalence for anxiety that meets criteria for a diagnosable disorder varies, but estimates suggest nearly one-third of adolescents meet criteria for an anxiety disorder by age 18 (31.9%; Merikangas, et al., 2010) with lifetime prevalence estimated between 15 and 20 percent (Beesdo et al., 2009). Anxiety disorders tend to persist across childhood and adolescence and into adulthood (Beesdo et al., 2009) indicating that problematic anxiety does not simply correct itself with time, but demands the attention and action of mental health providers and other professionals to help improve student outcomes. Anxiety disorders affect many youth; however, these estimates do not take into account subclinical levels of anxiety that may not meet criteria for a specific disorder, but may still have detrimental impacts on student functioning and wellbeing (Shaffer et al., 1996; Weis, 2014). Whether youth are specifically affected by an anxiety disorder or experience subclinical anxiety, this is a highly prevalent issue that

often results in significant impairment in youth lives. It is essential that youth experiencing anxiety concerns are identified early and receive appropriate supports and services in order to mitigate the potential for negative outcomes.

Need for Anxiety Identification and Services

A concerning statistic about childhood anxiety is that many children are not being identified or supported; estimates suggest that nearly 80% of children with a diagnosable anxiety disorder are not getting the treatment and supports that they need (Merikangas et al., 2011). Early identification of anxiety and the provision of appropriate services and supports are critical due to long-term effects that untreated anxiety at young ages can have on individuals later in life. Childhood anxiety has been linked with negative impacts across emotional, social, and academic domains (Donovan & Spence, 2000). Untreated childhood anxiety, or anxiety treated later in adulthood, can lead to subsequent issues, such as higher levels of absenteeism, increased substance use, fewer career opportunities, and increased use of medical care (Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005), along with major depression (Bittner et al., 2004). Anxiety in adolescence is predictive of later chronic stress, decreased life satisfaction, poorer adjustment, relationship problems, and insufficient coping skills (Essau, Lewinsohn, Olaya, & Seeley, 2014), as well as educational underachievement (Woodward & Fergusson, 2001).

Given the research indicating that anxiety concerns begin at a young age and that the majority of students with anxiety disorders are undiagnosed and untreated, schools provide a critical setting to facilitate prevention and intervention services. Anxiety represents an internal subjective experience that can manifest across three key domains, including cognitive (e.g., worry, problems with concentration or memory,

oversensitivity), behavioral (e.g., irritability, withdrawal, perfectionism), and physiological (e.g., headaches, rapid heart rate, sleeping problems) (Huberty, 2008; Huberty, 2014). However, students with internalizing concerns, such as anxiety, are often “silent sufferers” in the classroom, as schools more readily identify and endorse intervention for disruptive or externalizing behaviors (Gosch, Flannery-Schroeder, & Brecher, 2012). Many characteristics of anxiety are not as easily observable or fully understood and may make detecting anxiety concerns in schools more difficult (Gosch et al., 2012). Students struggling with mental health concerns, such as anxiety or depression, often experience difficulties with social and academic functioning in school (Huberty, 2008), and schools are in a unique position to serve these students. Clearly, the importance of identifying and helping children suffering from anxiety and getting them treatment is crucial, and schools can play a role in early identification and intervention for children with anxiety symptoms and potential anxiety disorders.

State of School-Based Intervention Efforts for Anxiety

The delivery of anxiety interventions in schools is a necessary next step in providing students with anxiety symptoms or disorders the supports and services they need to succeed. Results of systematic reviews and meta-analyses have demonstrated support for the effectiveness of anxiety programs for youth. In particular, one meta-analytic review found that anxiety prevention programs demonstrated effectiveness for school-aged children at posttest ($g = 0.22$) with evidence for indicated or selective prevention programs demonstrating larger effects than universal prevention programs (Teubert & Piquart, 2011). In another meta-analysis, small but significant effects were demonstrated for youth anxiety prevention programs at post-intervention in a review of

both school and community settings ($d = 0.18$; Fisak, Richard, & Mann, 2011). Another meta-analysis, focusing on universal prevention programs for anxiety and depression in schools, revealed small but significant effects at posttest on child anxiety ($g = 0.13$; Ahlen, Lenhard, & Ghaderi, 2015). Taken together, these results demonstrate small effects of prevention programs on youth anxiety; however, relatively small effects are common in prevention research as youth may not have yet developed symptoms (Fisak et al., 2011) and these small effects can still have meaningful impacts on anxiety prevention at the population level (Werner-Seidler, Perry, Calcar, Newby, & Christensen, 2017).

Other reviews have focused specifically on randomized controlled trials (RCT) of school-based anxiety programs. The methodological rigor of RCT designs make them particularly beneficial because they utilize random assignment and control conditions. RCTs also tend to minimize bias, have high internal validity, and provide opportunities to reject alternative explanations for measured effects (Clay, 2010; West & Spring, 2014). In a systematic review, Neil and Christensen (2009) found that 78% of reviewed RCTs demonstrated significant effects of school-based anxiety prevention and early intervention programs on anxiety symptoms ($ES = 0.11$ to 1.37). Another recent review of RCTs of school-based anxiety and depression prevention programs found small effects on anxiety at post-intervention ($g = 0.20$) with maintenance at short-term (0-6 months) and medium-term (6 to 12 months) follow-up (both $g = 0.23$) and found comparable effectiveness between universal and targeted anxiety programs (Werner-Seidler et al., 2017).

Within the intervention literature, programs grounded in cognitive behavioral therapy (CBT) have grown in popularity and use with children and adolescents in school

settings, comprising 78% (Neil & Christensen, 2009) and 84% (Werner-Seidler et al., 2017) of anxiety and/or depression interventions in recent systematic reviews. CBT has been found effective for varying disorders and symptoms, such as depression, substance abuse, attention deficit hyperactivity disorder, eating disorders, conduct disorder, and anger problems; notably, CBT has also been successful in treating a range of anxiety disorders, including generalized anxiety disorder, panic disorder, social phobia, obsessive-compulsive disorder, and agoraphobia (Beck, 2011). For youth specifically, decades of research generally support the effectiveness of CBT, especially in clinical settings (Gosch et al., 2012). Mychailyszyn and colleagues (2012) conducted a meta-analysis of CBT-based interventions in schools for youth with anxiety and depression, finding a statistically significant moderate mean effect size for anxiety reduction ($g = 0.50$). Overall, research suggests small to moderate effects of school-based anxiety prevention and intervention programs on student anxiety and common implementation of CBT-based supports.

Gaps in Knowledge

Despite the positive findings of meta-analyses and systematic reviews, our understanding of school-based programs for anxiety remains limited in several ways. With increasing effectiveness literature in the area of anxiety interventions, it is necessary to begin deconstructing the research to better determine the components that lead to beneficial student outcomes. In particular, questions remain regarding which specific components, structures, and features comprise impactful and effective school-based programs for anxiety. Since schools often serve as the providers of mental health, there are challenges or constraints such as time and resources that must be taken into

consideration for the design and implementation of mental health programs. Research should closely investigate intervention dosage and intensity, including number of program sessions, frequency and length of sessions, and program duration to help address these challenges. In addition, intervention program composition should be examined to determine if certain components may be more impactful than others or may accelerate treatment progress or student growth. Research should also explore the adequacy of formative assessment measures to capture mental health and internalizing symptoms, and the use of such assessments to determine program effectiveness or monitor student progress during intervention. Additional research in these areas can help inform under what conditions reductions in student anxiety may be achieved through school-based interventions.

Project Purpose

Given the high prevalence of anxiety in childhood and adolescence, the importance of early identification, and the need for treatment, additional research is warranted to ascertain anxiety intervention effectiveness for students in schools. Research has demonstrated effectiveness for many school-based anxiety interventions, especially for programs based in CBT, and has demonstrated the ability for schools to effectively serve as mental health service settings for students. The overall goals of this two-study dissertation were: (1) to determine the current state of the research literature on school-based anxiety interventions utilizing rigorous research designs through a systematic literature review (Study 1); and (2) use results from that review to inform the development and implementation of an applied school-based anxiety intervention utilizing a single case design framework (Study 2). Findings from these studies can help

address the research to practice gap and can be used by educators, professionals, and researchers to make decisions regarding the implementation of CBT-based and other anxiety programs in schools to support and serve students in achieving health and success.

CHAPTER 2

STUDY 1

**School-Based Anxiety Interventions: A Systematic Review of Randomized
Controlled Trials**

Abstract

A systematic literature review was conducted to examine anxiety interventions for youth in school settings. The purpose of this review was to update and expand upon a previous systematic review (Neil & Christenson, 2009) in order to more fully understand the state of the science regarding school-based interventions for anxiety. Specifically, the review described and synthesized randomized controlled trials (RCT) from articles published between 2008 and June 2016 through the evaluation of school-based anxiety programs in areas including program effectiveness, program content, intervention intensity, and participant age. Twenty articles containing 22 RCTs (representing 9,693 study participants) were coded and analyzed. Results indicated that 43% of trials reported statistically significant reductions in participant anxiety in areas such as non-specific or general anxiety, social anxiety, and anxiety sensitivity ($ES = -0.69$ to -0.15). The majority of reviewed programs were based in cognitive behavioral therapy (CBT) and were implemented with children or a child/adolescent combination. Future research should investigate effective components of CBT-based anxiety programs and detail necessary intervention dosage to increase effectiveness and prevent or reduce anxiety symptoms among students.

Keywords: anxiety, intervention, school, cognitive behavioral therapy, systematic review, randomized controlled trials

School-Based Anxiety Interventions: A Systematic Review of Randomized Controlled Trials

Anxiety is widely considered the most common class of childhood mental health disorders (Beesdo, Knappe, & Pine, 2009) with approximately 32% of adolescents meeting criteria for an anxiety disorder by age 18 (Merikangas, et al., 2010) and more youth experiencing subclinical anxiety symptoms (Shaffer et al., 1996; Weis, 2014). While anxiety is prevalent in this population, 80% of youth with a diagnosable anxiety disorder are not identified and do not get the treatment they need (Merikangas et al., 2011). Identifying and intervening early with children and adolescents with anxiety problems is necessary because left untreated, childhood anxiety can negatively impact social, emotional, and academic areas of life (Donovan & Spence, 2000). Untreated anxiety can lead to long-term consequences such as increased substance use (Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005), major depression (Bittner et al., 2004), and educational underachievement (Woodward & Fergusson, 2001), as well as chronic stress, decreased life satisfaction, and relationship problems (Essau, Lewinsohn, Olaya, & Seeley, 2014).

Given the deleterious impacts of anxiety, understanding evidence-based approaches to treatment in common mental health service settings, such as schools, is critical. The current study builds from existing anxiety literature to update and expand the landscape of school-based interventions and help pinpoint components that may contribute to program effectiveness. In particular, additional research is needed to help determine what types of programming, in what dosage, and for whom anxiety interventions can be effective in school-based settings. Specifically, the role of programs

based in cognitive behavioral therapy (CBT) and how these components are delivered to students were analyzed within the landscape of intervention studies. The purpose of the current study was to address these identified gaps and goals through a systematic literature review synthesizing randomized controlled trials (RCT) of anxiety interventions in schools.

Cognitive Behavioral Therapy and Interventions

Cognitive behavioral therapy (CBT) is a common and generally effective therapeutic technique for the treatment of anxiety and is considered the “treatment of choice for youth with internalizing disorders” (Compton et al., 2004, p. 930). CBT is an approach to treatment that combines principles of behavioral and cognitive psychology, in which therapists aim to help individuals change their cognitive distortions in order to make lasting behavioral change while emphasizing a goal-oriented, problem-focused approach (Beck, 2011). While originally designed for adults with depression, research also supports CBT as an effective treatment for a variety of psychiatric disorders and psychological problems across many populations and settings (see Beck, 2011). Research over the past two decades has also supported its effectiveness for use with children and adolescent populations, especially in clinical settings (Gosch et al., 2012). Specific to CBT for anxiety, Velting, Setzer, and Albano (2004) detailed six critical components of CBT for youth anxiety including: psychoeducation, somatic management, cognitive restructuring, problem solving, exposure, and relapse prevention. Each component plays an important role in service delivery, with varying emphases, goals, and strategies. These six components of CBT are often incorporated into intervention programs and treatment for youth with anxiety symptoms and disorders.

While early research focused on the use of CBT in clinics and communities, there has been an increased incorporation of CBT and its components into school-based interventions. Interventions based in CBT are now common school-based services for the treatment of anxiety. Schools are ideally suited to deliver these mental health services for students (Taras, 2004) and are especially beneficial settings for these anxiety programs given: (a) many students struggle with anxiety in the school environment and may benefit from treatment implemented in that setting; (b) school-based programs can be applied to groups or classrooms potentially minimizing student stigma; and (c) schools typically foster systems that support student outcomes, such as involvement from multiple parties, good communication channels, and valuable input on student behavior and progress from teachers and other school staff (Gosch et al., 2012).

Approaches to Treatment

Interventions based in CBT can be developed and delivered to youth in a number of different ways, such as through manualized treatment programs or through a modularized common elements approach. Manualized CBT-based anxiety prevention and intervention programs have been used increasingly and applied in schools around the world. Common manualized CBT-based programs implemented in school settings include Coping Cat (Kendall & Hedtke, 2006), the FRIENDS Programs (Barrett, Webster, & Turner, 2000), and Cool Kids (Rapee, Wignall, Hudson, & Schniering, 2000). Manualized programs have the benefit of increased accountability (Wilson, G. T., 2007), and tend to be more focused, direct, and generally have empirical evidence (Wilson, G. T., 1998). However, manualized programs are usually only commercially available and tend to be more resource intensive, including costs incurred to purchase

materials and complete trainings. Alternatively, the common elements approach (Chorpita, Daleiden, & Weisz, 2005) gathers evidence-based components from different interventions and programs to create a modularized treatment approach (Lyon et al., 2014). Interventions using a common elements approach tend to be more flexible and individualized (Lyon et al., 2014), but may require more intensive progress monitoring (Lyon, Borntreger, Nakamura, & Higa-McMillan, 2013). The common elements approach to intervention may be utilized in practical settings as an alternative when access to fully manualized programs is challenging, and the framework lends itself well to designing individualized treatment plans and incorporating evidence-based strategies into interventions (Barth, et al. 2014).

It is unclear how frequently the common elements approach may be implemented in school-based settings and to what extent it is being implemented successfully. While both traditional manualized programs and modularized programs have advantages and disadvantages, research is needed to ascertain the use of these treatment approaches in schools. In addition, research examining the effectiveness of anxiety programs and techniques used in schools, both those incorporating CBT and those not, is also necessary to mark progress and highlight areas for improvement. There is a need for continued investigation of the landscape of school-based anxiety intervention studies. An initial examination of the literature yielded a systematic review of interest serving as an appropriate starting point in furthering research on anxiety programs in schools.

Previous Systematic Review

Neil and Christensen (2009) published a systematic review investigating the efficacy and effectiveness of prevention and intervention programs for students with

anxiety in school settings. The authors reviewed articles with publication dates between 1987 and February 2008. Results indicated that 21 of the 27 RCTs reviewed included CBT or elements of CBT, that study quality ratings were generally low, and that 78% of the trials found anxiety improvements at posttest and/or follow-up ($ES = 0.11$ to 1.37 ; Neil & Christensen, 2009).

Neil and Christensen's review (2009) provided valuable information about both the effectiveness and composition of school-based anxiety programs by extracting and reporting meaningful findings based on extant empirical evidence, but research gaps identified in their study warrant further review. When examining the effectiveness of programs, it is necessary to consider for whom it is effective (e.g., participant age, demographic variables), what content or components are included, and the dosage or intensity of the delivered program. While the systematic review addressed program content, including CBT and some specific components of CBT, these elements were not defined and the distinction between what the authors meant by their use of "CBT" versus CBT "components" was not articulated. Noticeably, there is a need for clarification around how CBT and CBT components are defined and how these components are specifically incorporated into school-based intervention programs for anxiety.

Neil and Christensen incorporated a wide age range of students in their review, coding participants as children (5-12 years) and adolescents (13-19 years), but did not examine program effectiveness or program content by age. By combining children and adolescents of all ages in their analyses, the authors may not have identified potential developmental differences and their effect on program variables and measures. It is important to examine the developmental appropriateness of therapeutic techniques used

as many CBT-based programs employ methods requiring higher level cognitive processing and abstract thinking (Stallard, 2005). In particular, some components of CBT, such as cognitive restructuring, require meta-cognitive abilities that may be impacted by age and development.

Further, Neil and Christensen examined the number of sessions implemented for each anxiety program, but other important pieces of intervention intensity were not captured. Collecting additional information, including intervention frequency (number of sessions per week), duration (number of weeks of intervention), and minutes per session would present a clearer picture of intervention intensity for anxiety programs implemented in school settings and help examine the elements of the intervention that may differentially impact student outcomes.

Purpose and Research Questions

The purpose of the current review was to synthesize RCTs of school-based anxiety programs following similar methods utilized by Neil and Christensen (2009) to update and expand the literature from their systematic review. By addressing identified gaps and updating with current literature, the landscape of school-based anxiety intervention research can be better understood in terms of program effectiveness, content, and dosage. A review of RCTs was chosen due to the methodological rigor of the design, through the use of random assignment to intervention and control conditions and because RCTs possess high internal validity by ruling out alternative explanations for measured effects, which are not common in other research designs (Clay, 2010; West & Spring, 2014). Well-designed and well-executed RCTs have high internal validity and minimize bias. For these reasons, a synthesis of RCTs served as an appropriate starting point for

gathering causal evidence for the examination of anxiety interventions in school settings.

Specifically, the following primary research question was posed: (1) What is the effectiveness of anxiety prevention and intervention programs delivered in schools for RCTs published between January 2008 and June 2016? It was expected that the current review would find similar estimates of program effectiveness and anxiety improvement as Neil and Christensen (2009). Secondary research questions focused on program content and delivery: (2) What is the composition of school-based anxiety interventions, including the prevalence and use of CBT-based approaches and CBT components?; (3) What is the average and range of intervention intensity for school-based anxiety programs, including duration, frequency, and minutes per session?; and (4) What is the participant age range for programs found effective? It was expected that the majority of RCTs would employ interventions based in CBT, but findings regarding the composition of CBT components within programs, intervention intensity, and participant age were considered exploratory in nature. Finally, an additional supplemental research question was investigated: (5) To what extent do the findings of the current study relate to Neil and Christensen's findings? This question was addressed by applying the data extraction process in the current study to the article set included in Neil and Christensen's (2009) systematic review.

Method

Literature Search Strategy

A systematic online search using PsycInfo, PubMed, and Cochrane Library databases was conducted to identify studies for inclusion. Given the current study's primary goal of updating and extending the literature from Neil and Christensen's (2009)

systematic review, the search process utilized in this study was based on their described search procedures. The search terms applied were ("school*" OR "school-based" OR "adolescen*" OR "child*" OR "youth") AND ("prevent*" OR "early intervent*") AND ("anxiety" OR "anxious"), and these terms were used to search full text. Search results were filtered to include articles published either in print or online between January 2008 and June 2016.

Screening and Inclusion Criteria

Titles and abstracts of articles were reviewed for relevance, and articles were excluded if they were not an empirical intervention study (i.e., book, chapter, review, meta-analysis, etc.), if they used adult or non-human participants, or if they clearly did not pertain to “anxiety or resilience in children and adolescents” (Neil & Christensen, 2009, p. 209). The full text of articles retained in the relevance check was examined to determine their fit with the study inclusion criteria. In accordance with Neil and Christensen (2009), the current review utilized the same inclusion criteria: “(a) study participants were children (5-12 years) or adolescents (13-19 years), (b) the primary aim of the intervention trialed was to reduce or prevent the symptoms or incidence of anxiety, or to build resilience, (c) the intervention reported was a structured school-based program (delivered as part of the formal school curriculum or as an after school endorsed activity targeting school children), (d) one of the primary outcome measures in the study was anxiety symptomology or diagnosis, (e) the study was a randomized controlled trial (RCT), and (f) the study was published in a peer-reviewed, English language journal” (p. 209). To note, during data extraction, the primary intervention aim “to build resilience” was removed to support the first author’s focus on interventions specifically and

primarily targeting student anxiety.

Data Extraction

Articles meeting inclusion criteria were coded on a variety of study attributes encompassing four broad categories: participant characteristics, intervention characteristics, research design and measurement features, and quality ratings. General information for each study was coded, including: (a) author last name; (b) publication year; (c) journal name; and (d) country where the study was conducted. Participant characteristics collected included: (a) number of overall participants; (b) number of participants in treatment and control groups; (c) participant age range; (d) participant sex; (e) participant race; (f) reason for participant inclusion; (g) type of anxiety concern; and (h) anxiety disorder type. Intervention characteristics coded included: (a) program name; (b) intervention setting; (c) main purpose relating to anxiety; (d) intervention content, including whether the program was CBT-based and which CBT components were present; (e) interventionist type; (f) intervention delivery; and (g) information regarding intervention intensity, including total number of sessions, minutes per session, intervention duration (e.g., number of weeks or months), and intervention frequency. Programs coded as CBT-based were further examined and coded for CBT components utilized, including psychoeducation, somatic management, cognitive restructuring, problem solving, exposure, and relapse prevention in line with the conceptualization and definitions adapted from Velting, et al. (2004; see Table 1). Research design and measurement information coded included: (a) type of control group; (b) anxiety measurement assessment(s) utilized; (c) follow-up information, including whether follow-up was collected and the length of the follow-up period; and (d) effect size

information, including whether effect sizes were reported, as well as effect size type, effect size outcome type, and effect size value. Additionally, reported social validity and treatment integrity in the trials were coded.

Trials were also evaluated using quality indicators, which can help determine the degree to which a study can be replicated and can help support the internal validity of the study. A coding scheme obtained from Jitendra, Burgess, and Gajria (2011) based on Gersten et al. (2005) was adapted and applied to the article set. This framework was modified for use in the current study, retaining eight of the original ten essential indicators (with adjustments made to fit the current study) and added an additional indicator resulting in a total of nine quality indicators. Quality ratings included evaluations of the: (a) descriptive information on participants; (b) equivalence of groups across conditions; (c) descriptive information on interventionists; (d) description of intervention; (e) description and measurement of procedural fidelity; (f) appropriateness of data collection timing; (g) alignment of data analysis techniques to the research question with the appropriate unit of analysis; and (h) inclusion and interpretation of effect sizes (see Jitendra et al., 2011). The additional indicator developed and applied evaluated the reported psychometric adequacy of the outcome measure. Each quality indicator was rated a 0, 1, or 2, with a score of 2 indicating highest quality. Scores for each indicator were added to develop a total score (0-18 points) for each RCT and were reported as an index of study quality.

Additional Coding

The article set from Neil and Christensen's (2009) systematic literature review was also coded using the same data extraction processes in alignment with the current

study's fifth research question. The aim of this additional coding was to compare review results and determine the extent to which the findings in the current study related to those in Neil and Christensen. Attention was given to analyzing data extraction components that were not included in their original study.

Inter-Rater Agreement

Measuring inter-rater agreement is an indicator of quality and is important to incorporate in analyses to help minimize variation and yield consistency (Gwet, 2014), especially critical in systematic review processes emphasizing replicability. Study variables for all articles in the data extraction process were originally coded by the primary author. Inter-rater agreement was then calculated for 25% of the coded RCTs by a graduate student in school psychology. The process included explaining the purpose of the study, reviewing the codebook in detail, coding an article together, and having the coder independently code an article for practice. After reviewing the codes together to discuss any discrepancies and answer any additional questions, the formal reliability coding began. Inter-coder agreement was calculated using percent agreement across the four main coding categories: intervention characteristics, participant characteristics, design and measurement characteristics, and quality ratings. An average agreement code was also calculated across all categories and variables.

Inter-rater agreement was conducted on 25% of the coded trials in the study, resulting in the evaluation of 13 trials. Percent agreement was calculated across the four main coding categories with the following results: participant characteristics (90%), intervention characteristics (79%), design and measurement characteristics (78%), and quality ratings (75%). An average agreement code was calculated across the four

categories to provide an overall percent agreement calculation (81.47%).

Effect Size Calculations

To evaluate program effectiveness using anxiety outcome measures, standardized effect sizes were calculated for Cohen's d from each RCT using the means, standard deviations, and sample sizes provided using an online effect size calculator (Wilson, D. B., n.d.). Effect size estimates from Cohen's d (Cohen, 1988) were calculated using the equation: $d = \frac{M_1 - M_2}{SD_{pooled}}$, where M_1 represents the mean from the first sample, M_2 represents the mean from the second sample, and SD_{pooled} represents the pooled standard deviation for the two samples. As suggested by Cohen (1988), effect size estimates of 0.2 were regarded as small effects, 0.5 as moderate effects, and 0.8 as large effects. Total scale scores were reported instead of subscale scores, when possible. In a few cases, however, subscale measures were reported when total scale scores combined anxiety with depression, for example, or when the anxiety subscale was utilized as the primary anxiety outcome measure. Negative effect size estimates indicated anxiety improvement or a reduction in anxiety relative to the control group.

Evaluation of Publication Bias

The current study only reviewed published articles, leading to a potential criticism of the "file drawer" problem or publication bias which suggests that studies included in a review may not be truly representative of the field as researchers may file away and not publish studies finding nonsignificant results (Card, 2011). To address concerns regarding publication bias by not including non-published articles or papers in this systematic literature review, a "file drawer" correction formula, or failsafe N (Orwin, 1983), was calculated. The failsafe N calculation typically estimates the number of

studies with null findings that are needed to reduce the effect size mean to a non-statistically significant effect size, as in meta-analyses. In the current systematic review, the failsafe N calculated the number of studies needed to obtain the smallest effect in the review's sample.

Results

The literature search strategy resulted in the generation of 3,699 articles. Duplicate articles were removed, yielding a total of 3,362 articles for review. Titles and abstracts for all articles were reviewed for relevance and articles were excluded if they were not an empirical study, if they used adult or non-human participants, or if they did not relate to anxiety in children and adolescents, resulting in the exclusion of 3,250 additional articles. Full text reviews for the remaining articles were conducted and 83 additional articles were excluded during that process. A flow diagram detailing the study inclusion process is presented in Figure 1. Twenty-nine articles were initially identified for inclusion, but nine studies were subsequently deemed ineligible for inclusion during the coding process as more information was obtained. These studies were excluded for the following reasons: two studies focused primarily on depression, two studies focused broadly on stress, one study examined potential mental health benefits broadly, two studies focused on intervention acceptability and feasibility or cost-effectiveness without reporting specific anxiety outcomes, one study included no posttest assessments for the control group, and one study was a long-term follow-up for a study already included in the article set. Additionally, two articles contained two RCTs, and three articles contained multiple treatments (i.e. two intervention groups each). Articles with multiple treatments were evaluated to reduce to one intervention group per article, to avoid counting and

calculating effect sizes using the same control group twice and because including them would introduce redundancy to the data. In one study, an intervention group was eliminated because it was not school-based (Sportel, de Hullu, de Jong, & Nauta, 2013). In the remaining two studies, the most effective intervention group was retained (Calear et al., 2016; Stallard et al., 2014) given the primary purpose of identifying the most effective interventions. Therefore, 20 articles were analyzed and reported in the study results, including 22 RCTs evaluating school-based intervention effects on student anxiety. Table 2 presents information about anxiety program and study details for the identified trials.

General Characteristics

Articles represented research conducted in several different countries, including five studies from Australia, five studies from Canada, two studies from The Netherlands, and one study each from Norway, Spain, Germany, Portugal, England, Colombia, Israel, and the United States. Articles were published in a variety of peer-reviewed journals in areas of psychology, psychiatry, counseling, and education.

Participants. A total of 9,693 participants were included in the 22 RCTs. Participant numbers varied considerably across studies, ranging from 38 to 1439 students with a median of 172.5 students. The total number of participants in intervention conditions was 4,705 with a median of 81, and the total number in control groups was 5,139 with a median of 92.5 students. Participants in trials ranged in age from 7 to 18 years old. At the total participant level, trials were an average of 52.5% female and 47.5% male. Twelve trials reported the composition of males and females across intervention and control groups (55%). While the overall participant sample was fairly

evenly split with regard to gender, a subset of trials reported a predominately female sample (23%). Demographic information about race at the participant level was only reported in two trials (9%). Students were selected for study inclusion through screening measures in seven studies (32%; five trials used for inclusion and two trials used for exclusion), one study used multiple methods (4.5%; screening and nomination), and fourteen trials did not use a screening or nomination process (64%). Six trials had samples with reported subclinical levels of anxiety symptoms (27%), one trial included participants with a combination of diagnosed anxiety disorders and anxiety symptoms (4.5%), and the remaining trials did not report specific information on anxiety type or disorders. Information on participant educational disabilities and special education services was not reported in any of the identified trials.

Intervention content and purpose. The intervention program implemented most frequently in the identified trials was FRIENDS or FRIENDS-based in eight trials (36%), while the Aussie Optimism Program was implemented in two trials (9%), and other distinct programs were implemented in the remaining twelve trials. The majority of trials (18 trials; 82%) implemented programs that were clearly manualized, including programs such as FRIENDS, the Aussie Optimism Program, Dominique's Handy Tricks, and Taming Worry Dragons. Three studies trialed online programs available free of charge (14%). The majority of interventions had a primary prevention focus (15 trials; 68%) with fewer targeted intervention trials. Regarding the main focus of the interventions, fifteen trials (68%) aimed to reduce or prevent general or non-specific anxiety symptoms, three trials (14%) aimed to reduce anxiety symptoms and anxiety sensitivity (i.e. fearing anxiety and the sensations associated with anxiety due to a belief that those sensations

cause harm to the self and result in hazardous or negative consequences (Reiss, 1987; Taylor, 1995)), and four trials (18%) aimed to reduce specific anxiety symptoms, in areas such as social anxiety and state anxiety.

Intervention delivery. Most interventions were implemented during the school day (12 trials; 55%) or before or after school (6 trials; 27%); however, information was unclear or missing in four trials (18%). Interventions were delivered to small groups in twelve trials (55%) and to classrooms in ten trials (45%). Program interventionists varied across studies including implementation by external mental health providers (4 trials; 18%), classroom teachers (4 trials; 18%), researchers (3 trials; 14%), yoga teachers (1 trial; 4.5%), and combinations of teachers and school counselors (3 trials; 14%), external mental health providers and teachers (1 trial; 4.5%), external mental health providers and graduate students (1 trial; 4.5%), and trained health facilitators and teachers (1 trial; 4.5%). Three trials were delivered online (14%) and one trial (4.5%) did not clearly delineate the role or position of the interventionist.

Intervention social validity and fidelity. Seven trials (32%) reported social validity information. Two trials collected information from students (9%), two from students and teachers (9%), one from students and parents (4.5%), one from external mental health providers (4.5%), and one from a combination of students, teachers, and school counselors (4.5%). Four trials reported social validity with statistical data (18%), two trials with qualitative data only (9%), and one trial collected social validity without reported data (4.5%). Social validity data was rated as generally neutral to positive across studies. Ten trials (45%) assessed intervention integrity and reported data, while others (4 trials; 18%) assessed intervention integrity but did not report data, and the rest did not

report any intervention integrity information (8 trials; 36%). For trials that provided intervention integrity using adherence rate percentages, adherence on average was 90% with a range from 76.85% to 100%.

Design and measurement. All identified studies were randomized controlled trials. Control group type varied and included wait-list control (9 trials; 41%), no intervention or usual care control (8 trials; 36%), and active or attention control (4 trials; 18%). One trial (4.5%) had two control groups, a wait-list control and a “normal control” group (Balle & Tortella-Feliu, 2010). Follow-up was conducted in fifteen trials (68%) and not conducted in seven trials (32%). Of those trials that conducted follow-up, seven trials assessed at two follow-up time points. Follow-up periods ranged from 3 months to 18 months with medians of 6 months at first follow-up and 17 months at second follow-up. Sixteen trials (73%) reported effect sizes for anxiety outcome measures. Assessment tools to measure anxiety outcomes varied across trials, with some trials assessing anxiety using multiple measures. Common anxiety assessments utilized, alone or in combination, were the Multidimensional Anxiety Scale for Children (MASC; 27%), the Spence Children’s Anxiety Scale (SCAS; 23%), the Revised Children’s Manifest Anxiety Scale (RCMAS; 14%), and the Childhood Anxiety Sensitivity Index (CASI; 14%). Seven trials (32%) utilized multiple anxiety assessments, often a combination of the common measures and others, such as the Revised Child Anxiety and Depression Scale (RCADS), the State Trait Anxiety Inventory (STAI), the Spielberger Test Anxiety Inventory, and the Screen for Child Anxiety Related Emotional Disorders – Revised (SCARED-R). Several trials (32%) reported assessment subscale scores that were aligned with symptoms of particular anxiety disorders.

Study Quality

Trials were evaluated on nine quality indicators selected and adapted from Jitendra et al. (2011) and Gersten, et al. (2005). Trials were rated from 0 to 2 on each of the nine quality indicators, where scores of 0 showed the indicator was not met, scores of 1 showed the indicator was partially met, and scores of 2 showed the indicator was fully met. Totaling the quality indicator scores in each trial resulted in an index of study quality for each trial, with a maximum score of 18 representing the highest quality possible. Trials ranged in quality with a score range of 5 points (Velasquez, et al., 2015) to 15 points (Roberts, et al., 2010; Aune & Stiles, 2009). The median quality score was 12. The quality indicators that were most often fully met were: comparability of groups across conditions and appropriate timing of follow-up data collection, when measured. The quality indicators that were most often unmet or partially met were: psychometric adequacy of outcome measures, intervention description, and information on interventionists. There was high variability in quality indicator scores for the categories: description and measurement of procedural fidelity, information on participants, effect size information, and the alignment of data analysis techniques to the research question and utilizing the appropriate unit of analysis.

Program Content

Nineteen trials (86%) reported their intervention programs as either partially or wholly based in CBT. The six CBT component goals and techniques outlined in Velting et al. (2004) were used to review reported program content and code for CBT components. As displayed in Table 1, most studies utilized multiple components: nineteen trials (86%) used psychoeducation, eighteen (82%) used somatic management,

eighteen (82%) used cognitive restructuring, eleven (50%) used problem-solving, eight (36%) used exposure, and two (9%) used relapse prevention. Three trials (14%) only reported one CBT component, somatic management. Additionally, three trials (14%) did not specifically describe elements of cognitive restructuring, but instead detailed cognitive coping strategies, such as thought stopping and cognitive distraction. In thirteen trials (59%), additional intervention components were reported including content about community violence, mindfulness, attention training, family and peer support, communication skills, social life skills, self-management skills, emotion management and regulation training, biofeedback, task concentration training, social support, and yoga. Five trials (23%) reported a family or parent component, generally in the form of parent psychoeducation classes, and one trial (4.5%) reported additional components for teachers, school personnel, parents/guardians, and county health workers.

Program Intensity

Total number of program sessions ranged from 1 (Aune & Stiles, 2009) to 24 (Velasquez, et al. 2015) with a median of 9 sessions. Sessions varied in length from 20 to 135 minutes with fifteen trials (68%) reporting that each session lasted for 60 or fewer minutes. Two trials (9%) did not report the number of minutes per session. Intervention frequency was typically once per week (18 trials; 82%), but was also delivered twice per week (3 trials; 14%) and “biweekly” (1 trial; 4.5%). Intervention duration ranged from 1 week (Aune & Stiles, 2009) to 20 weeks (Roberts, et al. 2010) with a median of 9 weeks. Seven trials (32%) did not clearly report intervention duration information. Additionally, one trial (4.5%) did not clearly report total number of sessions or minutes per session, only intervention frequency and duration.

Participant Age

Participants ranged in age from 7 to 18 years. Studies generally reported age ranges, but some reported mean age and standard deviation, while others only reported grade level. Participants in the trials analyzed were categorized as children (under age 13; 50%), as adolescents (13 years or older; 14%), or both (36%).

Intervention Effects on Anxiety

One trial was not reported in the outcome analyses due to concerns with the quality of the outcome measure utilized (Velasquez, Lopez, Quinonez, & Paba, 2015). Of the 21 RCTs analyzed here, nine trials (43%) reported significant reductions in participant anxiety, including improvements in anxiety symptom areas such as non-specific anxiety, social anxiety, and anxiety sensitivity ($ES = -0.69$ to -0.15). Negative effect sizes reflected student anxiety reduction. Five of these trials reported significant improvements at posttest ($ES = -0.58$ to -0.15) and five trials reported significant improvements at follow-up ($ES = -0.69$ to -0.20). One trial reported significant intervention effects at both posttest and follow-up. Twelve trials (57%) did not report significant intervention effects on anxiety outcomes.

Given the magnitude of effects demonstrated by Neil and Christensen (2009), trials demonstrating effect sizes for statistically significant intervention effects of anxiety improvement at $d = |0.4|$ or higher were investigated further, in order to better understand the characteristics of studies yielding greater effects. This cutoff corresponds roughly to the moderate range proposed by Cohen's (1988) interpretive guidelines. Table 3 presents effect sizes in the moderate range for trials that found statistically significant effects at either posttest or follow-up alongside the trial's corresponding age range, program

content, and intervention intensity. Six trials (29%) reported effect sizes in the moderate range ($ES = -0.69$ to -0.42), with one trial reporting effects on two different outcome measures. Three of these trials reported intervention effects at posttest and three trials reported at follow-up. All six trials were based in CBT and utilized the CBT component of psychoeducation. In addition, five trials utilized cognitive restructuring, four utilized somatic management, four utilized exposure, two utilized problem solving, and one utilized relapse prevention. Regarding intervention intensity, the total number of sessions was between 6 and 10, lasting from 45 to 90 minutes, and implemented either once or twice per week. Three trials were found effective with a child-only sample, two with an adolescent-only sample, and one with a combination of children and adolescents. Trials with significant moderate effect sizes had a range of 7 to 14 (median 10.5) on total quality rating, whereas trials who did not surpass the 0.4 effect size had a range of 5 to 15 (median 12).

Failsafe N Results

The mean effect size from the observed studies was small ($d = 0.079$) with the observed number of effect sizes at 26. Since the mean effect size was already low, it was likely that this review's sample already included studies typically excluded due to publication bias (e.g., null findings or findings opposite than the general hypothesized direction). As such, this review's sample might be representative of a larger population of studies including both favorable and unfavorable findings. The failsafe N was calculated to determine the number of null finding studies needed to reduce the mean effect size not to a non-statistically significant effect size (as is commonly done in meta-analytic research) but instead to the smallest effect size in this review's sample ($d = 0.01$). Results

suggested that 179 studies with null results would be needed for inclusion in this review for the findings of the study to reduce to this minimum effect.

Neil and Christensen Comparison

In order to directly compare findings to prior research, the 29 articles included by Neil and Christensen (2009) were coded using the current study's protocol, which included 27 randomized controlled trials in total (four of which were follow-up studies to articles already included in the review). Intervention, participant, and measurement and design characteristics as well as quality rating indicators and intervention effects were compared. There were similar percentages of CBT-based intervention programs in Neil and Christensen (22 trials, 81%) as in the current study (19 trials, 86%). When analyzing specific intervention content components, Neil and Christensen results were compared to the current study: psychoeducation (85% vs. 86%), somatic management (52% vs. 82%), cognitive restructuring (81% vs. 82%), problem solving (44% vs. 50%), exposure (48% vs. 41%), and relapse prevention (48% vs. 9%). The Neil and Christensen articles had intervention sessions conducted once per week in 17 trials (63%), sessions conducted during school hours in 19 trials (70%), and session delivery in either small groups (10 trials, 37%), whole class (11 trials, 41%), or a combination (5 trials, 16%). These results were compared to the current study with 18 trials (82%) with weekly implementation, 12 trials (55%) with implementation during school hours, and 12 trials (55%) with small group delivery and 10 trials (45%) with whole class delivery. Neil and Christensen programs ranged from 2-104 total sessions (vs. 1-24 total sessions) with a median of 10 total sessions (vs. 9 total sessions), 15-120 minutes per session (vs. 20-135 minutes) with a median of approximately 60 minutes (vs. 60 minutes), and intervention duration ranged

from 8 weeks to year-long (vs. 1-20 weeks). Social validity measures were present in 5 trials (19%) in the Neil and Christensen article set compared to 7 trials (32%) in the current study.

Study design, quality ratings, and reported effects were also compared between article sets. Control groups across Neil and Christensen's studies were 37% (10 trials) wait-list control, 41% (11 trials) no intervention or usual care control, 15% (4 trials) attention control, and 7% (2 trials) multiple control types, compared to 41% (9 trials) wait-list control, 36% (8 trials) no intervention or usual care control, 18% (4 trials) attention control, and 4.5% (1 trial) multiple control types in the current study. For the Neil and Christensen article set, total quality ratings ranged from 7 to 14 with a median of 10 compared to the current study range of 5 to 15 with a median of 12. Twenty-one of 27 Neil and Christensen trials (78%) reported significant reductions in student anxiety ($ES = 0.11$ to 1.37), compared to 9 analyzed trials (43%) in the current study. Positive effect sizes indicated anxiety reduction in the Neil and Christensen study. Of those with significant reductions, 17 trials reported significant improvements at posttest ($ES = 0.11$ to 1.37) and 4 trials reported significant improvements at follow-up ($ES = 0.22$ to 0.81).

Using a similar procedure to examine program effectiveness as the current study, the Neil and Christensen trials that reported significant effect sizes in the moderate range ($d = |0.4|$ or higher) were further analyzed (see Table 4). Ten trials (37%) reported effect sizes in the moderate range ($ES = 0.41$ to 1.37 ; positive indicating anxiety reduction) in favor of the intervention, compared to 6 trials (29%; $ES = -0.69$ to -0.42 ; negative indicating anxiety reduction) in the current study. Five of the Neil and Christensen trials reported significant intervention effects in the moderate range at posttest only, 3 trials at

follow-up only, and 2 trials reported at both post-test and follow-up. All 10 trials were based in CBT. For these studies, the total number of sessions was between 8 and 13, lasting from 30 to 90 minutes, and implemented generally once per week. Trials with significant moderate effect sizes had a range of 7 to 14 (median 10.5) on measured quality ratings.

Discussion

This review examined the effectiveness and study details of school-based anxiety programs that used an RCT research design between 2008 and June 2016 following the general methods of Neil and Christensen (2009). Twenty articles covering 22 RCTs were coded and analyzed. The search revealed a sufficient number of school-based RCTs to include for a research synthesis indicating a richer and more rigorous scientific research base to examine student anxiety interventions in school settings. Research questions focused on the effectiveness, composition, dosage and intensity, and developmental considerations of school-based anxiety programs and compared overall results in the current study to those of Neil and Christensen (2009). Findings for the research questions are discussed below, along with limitations of the current review and directions for future research.

Effectiveness of School-Based Anxiety Programs

The primary purpose of this investigation was to determine the effectiveness of anxiety prevention and intervention programs delivered in schools for RCTs published between 2008 and June 2016. The expectation was that similar rates of program effectiveness and anxiety improvement would be found when compared with the previous systematic review (Neil & Christensen, 2009). The percentage of trials reporting

statistically significant intervention effects of anxiety reduction in the current review was less than Neil and Christensen found in their review, and fewer trials in the current review reported significant effect sizes in the moderate or greater range. One possible consideration for why this review uncovered few trials overall with significant intervention effects could be, in part, influenced by low and variable study quality. Trials in the current review varied in overall study quality with a range of 5 to 15 points for total quality score on an 18-point scale, and 10 trials (45%) scored 11 points or fewer. However, these results also aligned with similarly low study quality findings by Neil and Christensen (2009) even with the current study showing slightly better overall quality. In general, trials with low quality may lack sufficient rigor and detail on key study components and potentially influence the presence or magnitude of effects. The “garbage in garbage out” critique is common in systematic reviews and meta-analyses suggesting that “poor quality primary studies only results in conclusions of poor quality” (Card, 2011, p. 26). However, selecting appropriate quality indicators and evaluating study quality are challenging processes when conducting systematic reviews. The study adapted quality indicators (Jitendra et al., 2011; Gersten et al., 2005) for use in the current study; while these selected indicators were modified to fit the design and purpose of the review and they appeared to articulate a good fit with the RCT studies, the use of other indicators of study quality may have yielded different results. While study quality is an issue that necessitates consideration, the current review did not exclude studies based on low quality, in part due to the RCT-only nature of the review, and also because this review sought to understand the landscape of studies as a first step and empirically investigate this critique in future research.

Another consideration for finding few significant reductions of anxiety with moderate effect sizes could be the presence of prevention programs across the trials which are generally associated with smaller effect sizes than intervention programs since there is generally less anxiety to measure or anxiety has not yet developed (Fisak, Richard, & Mann, 2011). In the current study, 15 trials (68%) had a primary prevention focus, but there was a mix of prevention-based and intervention-based anxiety programs across both article sets with some noting dual purposes. Interestingly, there did not appear to be a clear pattern or link between whether a program was prevention or intervention-based and the presence or absence of significant reductions in anxiety with moderate effect sizes.

Composition of School-Based Anxiety Programs

The second research question investigated the composition of school-based anxiety programs, including the prevalence and use of CBT-based approaches and CBT components. The prediction was that the majority of identified trials in the current review would report implementing a CBT-based program, and nineteen trials (86%) reported their program as either being partially or wholly based in CBT. This percentage is slightly larger than that reported in Neil and Christensen's review (78%; 2009); however, as noted previously, the authors of the previous review did not operationalize CBT or its components, so the comparison should be interpreted cautiously. The high percentage of trials reporting CBT-based interventions is supported by research noting its increased use in school settings and with children and adolescents (Gosch et al., 2013). Nearly every trial reported multiple components of CBT, with a majority of trials utilizing psychoeducation, somatic management, and cognitive restructuring. The prevalence of

these three specific CBT components in prevention and intervention programs across the reviewed literature provide potential avenues for additional research. Literature has found school-based CBT programs to be effective in schools (Mychailyszyn, et al. 2012), but perhaps particular components of CBT embedded in prevention or intervention programs are more effective or impactful than other components. Future research could begin to tease apart component impact on student anxiety.

Manualized treatment programs were used in over three-quarters of the trials analyzed, and five of the six studies with significant intervention effects in the moderate range were manualized programs, with three based on the FRIENDS suite of programs. While manualized programs have many benefits (Wilson, G.T., 2007; Wilson, G.T., 1998), there are opportunities for studies to implement interventions using other treatment approaches, such as the common elements approach. Utilizing a common elements approach can potentially create more adaptive and efficient interventions to overcome common problems encountered in everyday practice, such as limited resources and high-need student populations in schools. Research investigating how the common elements approach to treatment can be infused in school settings is needed in the literature.

Fewer than a quarter of reviewed trials reported a family or parent component to the intervention design and implementation of anxiety programs, and one trial reported components across teachers, school personnel, parents, and health workers. Of the trials with parental components, half of these trials implemented it as part of the FRIENDS program in the form of parent sessions to help support intervention efforts and reinforce strategies and techniques in the home or community setting. Findings from this review

suggest opportunities for improvement in programming by expanding intervention components to include persons important in helping students with anxiety and with general mental health promotion such as parents and teachers. Research indicates that family and home factors affect anxiety onset and maintenance (Barrett, 1998); therefore, parent involvement in anxiety interventions are important for consideration for intervention design and delivery. In fact, Bernstein, Layne, Egan, and Tennison (2005) found greater anxiety reduction from adding a parent component comparing a child-only CBT group and a CBT for children plus parent training group across multiple anxiety measures. Additional parental involvement in anxiety interventions could help students generalize their learning and support practice of techniques outside the school setting.

Program Dosage and Intensity

The third research question examined intervention intensity for school-based anxiety programs, including duration, frequency, and minutes per session. When analyzing intervention intensity for the trials that found significant effects with moderate effect sizes, 6 to 10 sessions were implemented, lasting from 45 to 90 minutes and administered either once or twice per week. Longer sessions in school-based settings, especially during regular hours, would likely present significant barriers to initial and ongoing implementation; there are competing demands of academics and challenges with either removing students from academic instruction to receive an intervention or restructuring schedules to accommodate for delivery of anxiety prevention programming (e.g. Bienvenu, Siegel, & Ginsburg, 2010). Some manualized interventions are lengthy to implement and may be difficult to deliver in whole and with fidelity in the school setting thereby highlighting the importance of identifying barriers to the implementation and

sustainability of these programs (Owens, et al., 2014). Implementing interventions with a common elements approach may help consolidate programming aligned to particular student need and may help cut down on time spent delivering intervention. From this study, no meaningful trend could be ascertained given the small number of non-manualized trials presented here, representing an area for continued research.

Developmental Considerations

The fourth research question explored the participant age range for programs found effective. No predictions were proposed for this question as it was deemed exploratory in nature. Overall, participants ranged in age from 7 to 18 years, and the participants were generally children (5 to 12 years) or a combination of children and adolescents, with fewer adolescent-only (13 to 19 years) samples. From the trials yielding significant moderate effects, three trials were effective with children, two with adolescents, and one with both. The current study could not support any overall inferences about the moderating role of age for anxiety interventions in school settings; however, research of interventions in mainly clinical settings demonstrates mixed findings. For example, in one meta-analysis student age was shown to not moderate treatment outcomes of CBT interventions in efficacy trials across school and clinic settings (82% clinical settings; Bennett, et al. 2013). Another meta-analysis for effects of predominately CBT-based interventions on anxiety generally found larger, but more variable, effect sizes for adolescent groups (above age 13) when compared to child groups (age 13 or below) across mainly clinical settings (Reynolds, Wilson, Austin, & Hooper, 2012). Regarding age, research does indicate that the onset of anxiety in childhood begins early in the school career years (Merikangas, et al. 2010) emphasizing

the importance of and the need for prevention programs early. While minimal inferences in the current study can be made with few effective trials and limited analyses, future research should look to CBT-based intervention effectiveness by age in clinical, community, or other settings to better understand what may work best and for whom in school settings.

Comparison with Neil and Christenson

The final research question addressed the extent to which findings from the current study related to the findings from the Neil and Christensen (2009) systematic literature review. Comparing the article sets between the current review and Neil and Christensen, there was a similar presence of CBT theory in programs, similar intervention dosage and delivery, similar control group type representation, and generally similar quality ratings. When examining intervention effects, the Neil and Christensen article set had a higher number of significant reductions in anxiety and slightly more studies with moderate effect sizes and larger effects. Overall, the current study was able to extend and update the anxiety intervention research for youth in school based settings. Information garnered from this review helps inform future research and practice.

Limitations

There were several limitations in the current review that should be noted. First, given the nature of systematic reviews and coding procedures, the current study was bound by what the article authors did or did not report. This issue affects what data can and cannot be extracted, analyzed, and synthesized. Specifically, in regards to coding CBT components, this issue was of particular interest. In some cases, the reported information may not have been the most complete or comprehensive overview of the

program content and its accompanying components thereby affecting the number of CBT components coded for this review.

Second, indicators of study quality were adapted and applied based in previous research; however, the selected indicators may not have fully captured all aspects of study quality. For example, the current study did not ascertain the quality of the control group which is an important factor that may influence estimates of effect. However, many trials did not report detailed information about control groups, especially when using active or attention controls, furthering the difficulty of evaluating quality. In general, assessing study quality that adequately addresses all relevant dimensions of a study without being too cumbersome or inflexible is difficult; indeed, evaluating study quality in systematic reviews and meta-analyses is complex and challenging even with assessment frameworks and guidelines (Valentine & Cooper, 2008).

Third, the current review focused solely on RCTs. While RCTs are a methodologically rigorous research design comprised of random assignment and control conditions and generally yield high quality evidence, they are also resource intensive. As a result, RCTs may not always be a feasible option for assessing intervention effects in some settings, particularly in schools, resulting in the utilization of other study designs. Given the current review's emphasis on RCTs of anxiety programs conducted in schools, empirical studies conducted in this area using research designs other than RCTs were not assessed and these studies could have provided a differing landscape of what effective interventions look like across the literature.

Fourth, the review focused solely on an electronic search using the search terms and the three databases outlined in the method. Not all relevant articles may have been

obtained using those databases and search terms. Despite conducting a thorough search process, additional articles might have been missed that could have impacted the findings from this selection of studies.

Lastly, the current study was not a formal meta-analysis. A formal meta-analysis was not conducted due to the relatively small number of studies included and the desire to implement a more detailed and nuanced coding scheme to better understand the literature. The small cell sizes within coding categories would limit interpretation and generalizability of results. Further, as with Neil & Christenson (2009), the inclusion of both efficacy and effectiveness trials would further complicate interpretation of meta-analytic findings. Therefore, the current study carried out a systematic literature review in order to better understand the state of the science regarding school-based anxiety interventions. However, such reviews do not permit the formal analysis of moderators, and thus future research is needed in this area.

Implications for Future Research

There are many directions for future research in the area of school-based anxiety interventions. One area for improvement developed as a result of assessing study quality using the indicators previously outlined. Many trials did not report sufficient information about the participant sample, the intervention implemented, the interventionists utilized, or the structure and content of the control groups. Low quality in these areas limits the generalizability of the research findings and makes replicability more difficult. Information on participant race, as one example, was only reported in two trials. Specifically, future intervention studies should provide more detailed demographic information, especially at the participant level, to better ascertain the population to which

the results may be generalized. Additionally, there was a lack of information about the nature of anxiety symptoms in the study samples. Some trials used screening measures for sample inclusion but many more did not, and only one trial reported that some of their sample had diagnosed anxiety disorders. More information about participants, including anxiety type and symptoms, is critical to determine for whom some interventions may be effective.

Prevention and intervention effectiveness studies should select and analyze outcome measures carefully. A number of trials in the current review utilized subscale measures alone, or in addition to, total scores on assessment tools. Researchers may be interested in intervention effects on outcome measures corresponding to particular types of anxiety that are often measured on subscales, such as generalized anxiety, separation anxiety, or social phobia. While reliance on subscale scores should be cautioned due to their general tendency to not be as reliable as total scale scores, limitations in measurement of anxiety symptoms generally and in outcomes for non-clinical samples may warrant consideration for subscale use. Sound reasoning should be articulated for the inclusion of measuring and reporting subscale scores; researchers should weigh the benefits and drawbacks for reporting subscale scores versus total scale scores and tailor those decisions to fit with the study purpose and goals for generalizability. Additionally, researchers should use measures that are psychometrically sound and report reliability and validity information for every measure. Most trials in the current review reported reliability statistics for outcome measures, but few reported information on validity. Without reporting information about construct validity, for example, confidence that the assessment or subscale is measuring what it purports to is weakened. Overall, future

research should carefully report and evaluate decisions made about outcome measure selection and analysis for anxiety.

The current review collected detailed information on intervention characteristics, including a high number with theoretical bases in CBT. The majority of trials utilized three or more components of CBT in their intervention programs, leading to questions about which components of CBT may be the most impactful or effective for anxious youth, including if combinations of components or if a specific sequence may be more effective than others. Additionally, future research should work to determine which components might be most effective for which age groups; younger participants may have not yet developed the cognitive capacities to engage in all CBT components in the same ways as older participants and may necessitate program content or delivery modifications or adaptations (Stallard, 2005). Further, most reviewed programs were manualized, leaving opportunity for future studies to embark on a common elements approach for the implementation of CBT components which could help improve program flexibility and treatment individualization for participants.

Conclusion

The current systematic review described and synthesized RCTs of school-based anxiety interventions, specifically investigating program effectiveness as well as program content, intervention intensity, and participant age. Small to moderate effect sizes were found in the current review, and fewer trials reported significant intervention effects across multiple measures of anxiety than were found in the review by Neil and Christensen (2009). Programs based in CBT were commonly implemented with a wide age range in school settings and additional research is warranted to investigate effective

components and appropriate intervention intensity and dosage. Work in the field of anxiety interventions continues to be of great importance given the high prevalence of anxiety disorders and subclinical anxiety symptoms in youth and the detrimental effects untreated anxiety may have in the future.

Table 1

CBT Component Definitions Adapted from Velting, Setzer, and Albano (2004)

CBT Component	Definition
Psychoeducation	Information about what anxiety is, the normalization of anxiety, and the connection between thoughts, feelings, and behaviors
Somatic management	Techniques to target and reduce anxiety symptoms that are physiological in nature and decrease physical arousal; may include training in breathing, muscle relaxation, meditation, exercise
Cognitive restructuring	Techniques to identify unhelpful thinking or negative thought patterns and replace with positive or coping self-talk to shift from anxiety-focused thinking to realistic and rational thinking
Problem solving	Techniques to help identify problems, develop solutions, implement a plan or action, and evaluate results through a problem solving system
Exposure	Techniques to target feared stimuli or situations using systematic and progressive exposure to help build and utilize skills in managing anxiety
Relapse prevention	Techniques to generalize and maintain learned anxiety skills over time and reduce need for continued support; may include booster sessions, session fading, role playing

Table 2

Program and Study Details for School-Based Anxiety Interventions

Citation	Program	Country	Total N	Age	Control Type	Theory Base	Program Content	Total Sessions	Mins./ Session	Sessions/ week	Quality Rating
*Aune & Stiles (2009)	Norwegian Universal Preventive Program for Social Anxiety	Norway	1439	10-15	NI	CBT	Psychoeducation, cognitive restructuring, problem solving, exposure	1	135	1	15
*Balle & Tortella-Feliu (2010)	FRIENDS ^a	Spain	92	11-17	WLC NC	CBT	Psychoeducation, somatic management, exposure + cognitive coping strategies	6	45	2	10
*Bouchard, Gervais, Gagnier, & Loranger (2013)	Dominique's Handy Tricks	Canada	59	9-12	WLC	CBT	Psychoeducation, cognitive restructuring, problem solving, exposure	10	75	1	14
Calear, Batterham, Poyser, Mackinnon, Griffiths, & Christensen (2016)	E-couch Anxiety and Worry Program	Australia	1340	12-18	WLC	CBT	Psychoeducation, somatic management, cognitive restructuring	6	30-40	1	11
*Calear,	MoodGYM	Australia	1477	12-17	WLC	CBT	Psychoeducation,	5	20-40	1	12

Citation	Program	Country	Total N	Age	Control Type	Theory Base	Program Content	Total Sessions	Mins./ Session	Sessions/ week	Quality Rating
Christensen, Mackinnon, Griffiths, & O'Kearney (2009)							somatic management, cognitive restructuring, problem solving				
Cooley-Strickland, Griffin, Darney, Otte, & Ko (2011)	FRIENDS	USA	93	8-12	WLC	CBT	Psychoeducation, somatic management, cognitive restructuring, problem solving, exposure + community violence curricula	13	60	biweekly ^b	9
*Essau, Conradt, Sasagawa, & Ollendick (2012)	FRIENDS	Germany	638	9-12	WLC	CBT	Psychoeducation, somatic management, cognitive restructuring, problem solving, relapse prevention	10 (+2 booster)	60	1	13
Johnson, Burke, Brinkman, & Wade (2016)	.b Mindfulness in Schools	Australia	308	M= 13.63 SD= 0.43	NI	MBCT, MBSR	Somatic management + mindfulness	8	35-60	1	11
Manassis, Wilansky-Traynor, Farzan, Kleiman, Parker, &	The Feelings Club	Canada	148	Grades 3-6	AC	CBT	Psychoeducation, somatic management, cognitive restructuring, problem solving,	12	60	1	12

Citation	Program	Country	Total N	Age	Control Type	Theory Base	Program Content	Total Sessions	Mins./ Session	Sessions/ week	Quality Rating
Sanford (2010)							exposure				
Miller, Laye-Gindhu, Bennett, Liu, Gold, March, Olson, & Waechtler (2011)	FRIENDS for Life	Canada	533	M= 9.77 SD= 0.99	WLC	CBT	Psychoeducation, somatic management, cognitive restructuring, problem solving	9	-	1	14
Miller, Laye-Gindhu, Liu, March, Thordarson, & Garland (2011) <i>Study 1</i>	FRIENDS	Canada	191	M= 10.1 SD= 0.93	AC	CBT	Psychoeducation, somatic management, cognitive restructuring, problem solving	9	60	1	13
Miller, Laye-Gindhu, Liu, March, Thordarson, & Garland (2011) <i>Study 2</i>	FRIENDS	Canada	253	M= 9.8 SD= 0.78	AC	CBT	Psychoeducation, somatic management, cognitive restructuring, problem solving	9	60	1	13
Miller, Short, Garland, & Clark (2010)	Taming Worry Dragons	Canada	116	7-12	WLC	CBT	Psychoeducation, somatic management, cognitive restructuring, exposure + cognitive coping	-	-	1	11

Citation	Program	Country	Total N	Age	Control Type	Theory Base	Program Content	Total Sessions	Mins./ Session	Sessions/ week	Quality Rating
							strategies				
*Pereira, Marques, Russo, Barros, & Barrett (2014)	FRIENDS for Life	Portugal	38	8-12	WLC	CBT	Psychoeducation, somatic management, cognitive restructuring, exposure + attention training, social support	10	90	1	10
Roberts, Kane, Bishop, Cross, Fenton, & Hart (2010)	Aussie Optimism Program	Australia	496	11-13	NI	CBT	Psychoeducation, cognitive restructuring, problem solving + communication skills, social life skills	20	60	1	15
Rooney, Hassan, Kane, Roberts, & Nesa (2013)	Aussie Optimism Positive Thinking Skills Program	Australia	910	M= 8.75 SD= 0.36	NI	CBT	Psychoeducation, somatic management, cognitive restructuring, exposure + self-management and coping skills	10	60	1	14
Scholten, Malmberg, Lobel, Engels, & Granic (2016)	Dojo	The Netherlands	138	11-15	AC	-	Somatic management + emotion regulation training, heart rate variability biofeedback	6	60	2	14
*Sportel, de Hullu, de	Cognitive Behavioral	The Netherlands	154	13-15	NI	CBT	Psychoeducation, cognitive	10	90	1	11

Citation	Program	Country	Total N	Age	Control Type	Theory Base	Program Content	Total Sessions	Mins./ Session	Sessions/ week	Quality Rating
Jong, & Nauta (2013)	Group training						restructuring, exposure, relapse prevention + task concentration				
*Stallard, Skryabina, Taylor, Phillips, Daniels, Anderson, & Simpson (2014)	FRIENDS	England	890	9-10	NI	CBT	Psychoeducation, somatic management, cognitive restructuring, problem solving	9	60	1	12
Velasquez, Lopez, Quinonez, & Paba (2015)	Yoga workshops	Colombia	125	Grades 5, 8, 9	WLC	-	Somatic management + yoga	24	120	2	5
Yahav & Cohen (2008) <i>Arab School</i>	-	Israel	124	14-16	NI	CBT + stress management	Psychoeducation, somatic management, cognitive restructuring + stress management training, biofeedback	8	60	1	7
*Yahav & Cohen (2008) <i>Jewish School</i>	-	Israel	131	14-16	NI	CBT + stress management	Psychoeducation, somatic management, cognitive restructuring + stress management	8	60	1	7

Citation	Program	Country	Total N	Age	Control Type	Theory Base	Program Content	Total Sessions	Mins./ Session	Sessions/ week	Quality Rating
							training, biofeedback				

Note. NI = no intervention control; WLC = wait-list control; AC = active/attention control; NC = “normal control”; CBT = cognitive behavioral therapy; - = missing or unclear information.

*Denotes trials that found statistically significant effects

^a Program based largely on FRIENDS

^b Authors reported intervention frequency as “biweekly”

Table 3

Trials with Significant Intervention Effects and Effect Sizes in the Moderate Range

Citation	Effect Size	Time	Anxiety Measure	Age	CBT Components	Intervention Intensity
Balle & Tortella-Feliu (2010)	-0.57	Follow-up (6 months)	CASI	11-17	Psychoeducation, somatic management, exposure + cognitive coping strategies	6 sessions 45 mins/session 2 times per week
Bouchard, Gervais, Gagnier, & Loranger (2013)	-0.46 -0.48	Posttest Posttest	CASI MASC	9-12	Psychoeducation, cognitive restructuring, problem solving, exposure	10 sessions 75 mins/session 1 time per week
Essau, Conradt, Sasagawa, & Ollendick (2012)	-0.69	Follow-up (12 months)	SCAS (total anxiety)	9-12	Psychoeducation, somatic management, cognitive restructuring, problem solving, relapse prevention	10 sessions (+2 booster sessions) 60 mins/session 1 time per week
Pereira, Marques, Russo, Barros, & Barrett (2014)	-0.56	Posttest	SCARED-R (child report)	8-12	Psychoeducation, somatic management, cognitive restructuring, exposure	10 sessions 90 mins/session 1 time per week
Sportel, de Hullu, de Jong, & Nauta (2013)	-0.42	Follow-up (6 months)	RCADS (social phobia)	13-15	Psychoeducation, cognitive restructuring, exposure, relapse prevention + task concentration	10 sessions 90 mins/session 1 time per week
Yahav & Cohen (2008) <i>Arab School</i>	-0.58	Posttest	STAI (state subscale)	14-16	Psychoeducation, somatic management, cognitive restructuring	8 sessions 60 mins/session 1 time per week

Note. Effect sizes are in Cohen's *d*.

CASI = Childhood Anxiety Sensitivity Index; MASC = Multidimensional Anxiety Scale for Children; SCAS = Spence Children's Anxiety Scale; SCARED-R = Screen for Child Anxiety Related Emotional Disorders-Revised; RCADS = Revised Child Anxiety and Depression Scale; STAI = State-Trait Anxiety Inventory.

Table 4

Neil and Christensen (2009) Trials with Significant Intervention Effects and Effect Sizes in the Moderate Range

Citation	Effect Size	Time	Anxiety Measure	Age	CBT Components	Intervention Intensity
Barrett & Turner (2001)	0.41	Posttest	RCMAS	10-12	Psychoeducation, somatic management, cognitive restructuring, exposure, relapse prevention	10 sessions (+2 booster sessions) 75 mins/session 1 time per week
Berger, Pat-Horenczyk, & Gelkopf (2007)	0.96	Posttest	SCARED	Grades 2-6	Psychoeducation, somatic management, cognitive restructuring, problem solving, relapse prevention	8 sessions 90 mins/session 1 time per week
Gillham, et al. (2006)	0.63 0.81	Follow-up 6 months 12 months	RCMAS	Grades 6-7	Psychoeducation, cognitive restructuring, problem solving, relapse prevention	8 sessions 90 mins/session 1 time per week
Hains (1992) <i>Anxiety management training group</i>	1.27	Posttest	STAI	15-16	Psychoeducation, somatic management, relapse prevention	9 sessions 30-40 mins/session NA times per week
Hains (1992) <i>Cognitive intervention group</i>	1.13	Posttest	STAI	15-16	Psychoeducation, cognitive restructuring, exposure, relapse prevention	9 sessions 30-40 mins/session NA times per week
Hains & Ellmann (1994)†	1.37	Posttest	STAI	Grades 9-12	Psychoeducation, somatic management, cognitive restructuring, problem solving, exposure, relapse prevention	13 sessions 50 mins/session NA times per week
Kiselica, et al. (1994)	0.76 1.03	Posttest Follow-up 1 month	STAI	Grade 9	Psychoeducation, somatic management, cognitive restructuring	8 sessions 60 mins/session 1 time per week

Citation	Effect Size	Time	Anxiety Measure	Age	CBT Components	Intervention Intensity
Lock and Barrett (2003); Barrett, et al. (2006)	0.70	Follow-up 36 months	RCMAS	9-16	Psychoeducation, somatic management, cognitive restructuring, exposure, relapse prevention	10 sessions (+2 booster sessions) 75 mins/session 1 time per week
Lowry-Webster, et al. (2001, 2003)	0.62	Posttest	SCAS	10-13	Psychoeducation, somatic management, cognitive restructuring, problem solving, exposure, relapse prevention	10 sessions (+2 booster sessions) 60-75 mins/session 1 time per week
	0.63	Follow-up 12 months				
Misfud & Rapee (2005)	0.57	Follow-up 4 months	SCAS	9-10	Psychoeducation, cognitive restructuring, exposure	8 sessions 60 mins/session 1 time per week

Note. Effect sizes are in Cohen's *d*.

SCAS = Spence Children's Anxiety Scale; SCARED-R = Screen for Child Anxiety Related Emotional Disorders; RCMAS = Revised Children's Manifest Anxiety Scale; STAI = State-Trait Anxiety Inventory.

†(elevated anxiety group only)

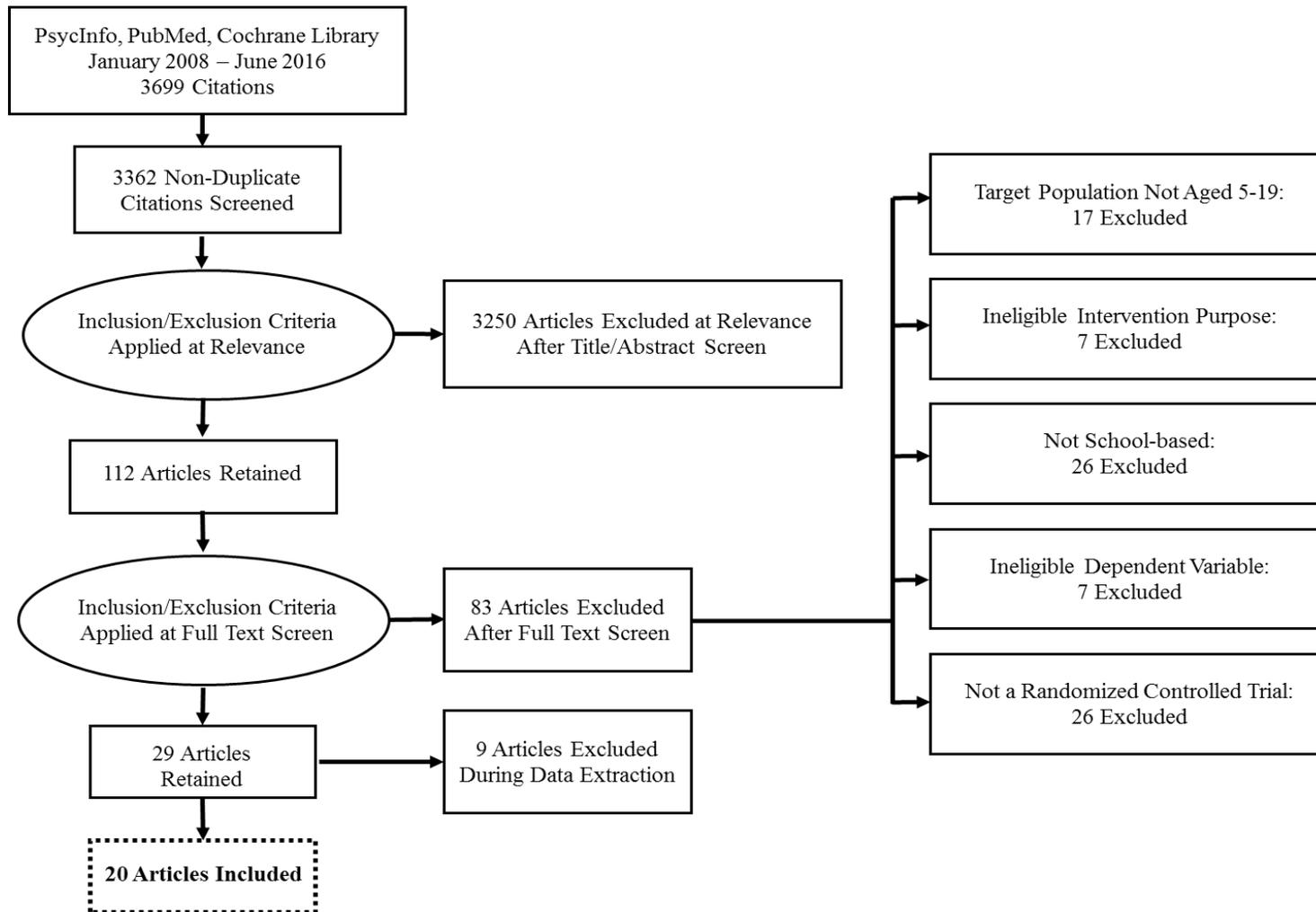


Figure 1. A PRISMA flow diagram describing the sequence of steps involved in the selection of studies

CHAPTER 3**STUDY 2****Think Good Feel Good: Examining the Impact of a School-Based Intervention on
Student Anxiety Using Single Case Design**

Abstract

The current study implemented a low-cost, 6-week, CBT-based modularized intervention program, Think Good Feel Good, to address student anxiety in an elementary school through a multiple-baseline single case design. The main purpose of the study was to analyze the effectiveness of the program as measured by formative and summative assessment measures of anxiety following a multi-method, multi-source approach. Participants included 14 students across third, fourth, and fifth grades at a public elementary school. Results of the study indicated both responders and non-responders to the intervention. Self-report data on the Multidimensional Anxiety Scale for Children (MASC-2) pre/post assessments showed statistically significant anxiety reduction on the generalized anxiety disorder ($t(10) = 3.12, p = 0.011$) and the physical symptoms ($t(10) = 2.57, p = 0.028$) subscales, whereas parent and teacher pre/post data and progress monitoring data revealed mixed findings. Social validity data from students indicated high acceptability and perceived utility. The implications of these results for future research and practice are discussed.

Keywords: anxiety, intervention, school, cognitive behavioral therapy, Think Good Feel Good, single case design

Anxiety Using Single Case Design

Research in the area of childhood anxiety has consistently demonstrated the high prevalence of childhood anxiety and articulated the need for early identification and treatment. The need for effective intervention is illustrated by several important statistics: (a) approximately 32% of adolescents meet criteria for an anxiety disorder diagnosis by age 18 (Merikangas et al., 2010); (b) many more youth experience subclinical yet problematic symptoms of anxiety (Shaffer et al., 1996; Weis, 2014); (c) approximately 80% of youth with a diagnosable anxiety disorder go unidentified and lack needed services (Merikangas et al., 2011); and (d) untreated anxiety in childhood affects social, emotional, and academic functioning (Donovan & Spence, 2000) and can lead to detrimental long-term effects, such as decreased life satisfaction (Essau, Lewinsohn, Olaya, & Seeley, 2014), educational underachievement (Woodward & Fergusson, 2001), and major depression (Bittner et al., 2004). These issues underscore the importance of determining which programs and interventions are effective for youth with anxiety, particularly in schools, which serve as common mental health service settings.

CBT-Based Anxiety Programs in Schools

Reviews of school-based anxiety prevention and intervention programs have been shown to reduce student anxiety (e.g., Neil & Christensen, 2009; Werner-Seidler, Perry, Callear, Newby, & Christensen, 2017). Specifically, success for interventions based in cognitive behavioral therapy (CBT) has been demonstrated. CBT-based programs typically incorporate several of six essential CBT components for youth with anxiety (Velting, Setzer, & Albano, 2004) including, psychoeducation, somatic management,

cognitive restructuring, problem solving, exposure, and relapse prevention. CBT-based interventions are commonly implemented in schools and have shown effectiveness for reducing student anxiety in these settings (e.g., Mychailyszyn, Brodman, Read, & Kendall, 2012). Anxiety interventions based in CBT conducted in school settings have also been successful in reducing student anxiety in both clinical and subclinical samples. For example, Pereira and colleagues (2014) found significant anxiety improvement for a sample of students with clinical symptoms and anxiety disorders, including separation anxiety, social phobia, specific phobia, and generalized anxiety. Social phobia was significantly reduced in a sample of students with social anxiety (Sportel, de Hullu, de Jong, & Nauta, 2013). In other school-based studies, there was evidence of anxiety reduction for students with high anxiety sensitivity without anxiety disorders (Balle & Tortella-Feliu, 2010) and for students with general subclinical anxiety symptoms (Bouchard, et al. 2013). These findings demonstrate the utility of CBT-based anxiety interventions for varying student samples.

While CBT-based interventions are commonly used in schools and have demonstrated effectiveness in improving anxiety, little is known about which of the main CBT components or which combination of CBT components may have the greatest impact on anxiety in the school setting. Component analyses of CBT have been conducted for a variety of disorders, including generalized anxiety disorder and depression (e.g., Borkovec, Newman, Pincus, & Lytle, 2002; Jacobson et al., 1996). For example, in a study conducted with adults diagnosed with generalized anxiety disorder, results indicated no significant differences in effectiveness of treatment on anxiety outcomes between three groups: (a) cognitive therapy alone, (b) applied relaxation

training combined with self-control desensitization, and (c) combination of both treatments (Borkovec et al., 2002). Studies have been conducted in therapeutic or clinical settings with adults; additional research is needed examining the impact CBT components have on child anxiety in school-based interventions. One way to more closely examine and utilize CBT components in intervention programming is to use a flexible or modularized treatment approach, such as the common elements approach.

Common Elements Approach

The common elements approach (Chorpita, Daleiden, & Weisz, 2005) is an approach to treatment that examines and utilizes common intervention components across many evidence-based programs for delivery to participants, especially in mental health (Lyon et al., 2014). While this approach may take on many different forms, Lyon and colleagues (2014) detailed that it tends to be more flexible in nature and provide more individualized care, as well as increase acceptability among interventionists (Borntager, Chorpita, Higa-McMillan, & Weisz, 2009) and improve efficacy in general when compared to manualized approaches (Weisz et al., 2012). However, the common elements approach also often requires intensive progress monitoring to gauge intervention appropriateness and effectiveness with participants (Lyon, Borntager, Nakamura, & Higa-McMillan, 2013). While there are many potential advantages of utilizing a common elements approach, there may also be challenges for use in a group format where elements tend to be tailored to specific needs. The common elements approach can be regarded as a more modularized approach to treatment, emphasizing flexible and evidence-based intervention.

An alternative treatment approach to common elements is a manualized approach

to intervention. Manualized programs are common and follow a set curriculum, such as Coping Cat (Kendall & Hedtke, 2006) or FRIENDS (Barrett, Webster, & Turner, 2000). While manualized programs have potential benefits, such as increased accountability, larger amounts of empirical evidence, and commercial availability (Wilson, G. T., 1998; Wilson, G. T., 2007), they often require increased resources pertaining to time and money for training and materials. While intervention effectiveness research generally evaluates manualized programs, there is a need for additional research investigating effectiveness of other treatment modalities, such as those aligned with the common elements approach. Using a modularized approach, effective components of CBT could be combined and delivered in a more tailored and flexible intervention program. The common elements approach may be beneficial for students in school settings, particularly in schools with limited resources.

Think Good Feel Good Program

The intervention program of interest in the current study is Think Good Feel Good (TGFG; Stallard, 2002) which was designed as a set of materials to use with children and adolescents. TGFG is neither a manualized intervention curriculum nor a comprehensive CBT program, but was developed to be used flexibly to meet individual or small group needs, reflecting a modularized approach. The program is grounded in CBT and presents key CBT concepts and techniques in an approachable and child-friendly manner. The purpose of TGFG is to familiarize participants with the CBT framework and use this approach to help them identify their thoughts, feelings, and behaviors while learning adaptive coping strategies and cognitive techniques. TGFG materials are available in a published workbook (Stallard, 2002) supplemented with a

therapist manual (Stallard, 2005) which contain program content as well as the historical, research, and practical implications and uses of CBT and its application with youth.

Think Good Feel Good offers a low-cost and easy to use set of materials that makes it a feasible option for implementation in schools. The workbook costs between \$20-25 and the therapist manual costs approximately \$35 with both available for purchase online. There are online resources available for download with the purchase of TGFG, including worksheets and lesson pages for students and interventionists. The materials are designed for use by professionals in clinical settings such as psychiatrists, clinical psychologists, and other therapists, as well as for professionals in school or community settings such as school psychologists, social workers, counselors, teachers, and nurses. Topics are presented with practical activities, examples, and worksheets that are easy for professionals to implement with youth. Because TGFG can be used flexibly and adapted to individuals or small groups, the materials provide resources and strategies to address a range of concerns and needs. Of note, an updated second edition of the TGFG workbook (Stallard, 2019) was recently published in January 2019 extending CBT components from the previous edition to incorporate theory and techniques relating to mindfulness, compassion focused therapy, and acceptance and commitment therapy.

While TGFG has strong CBT underpinnings, empirical research on TGFG is very limited. A search of the literature revealed no peer-reviewed published studies examining the effectiveness of TGFG workbook materials on student outcomes. There are, however, variations and adaptations of TGFG present in the literature. A computerized CBT (cCBT) program called Think, Feel, Do (TFD) was developed by TGFG's author, Paul Stallard, based on the TGFG materials. A small pilot randomized controlled study of

TFD was administered in-home to children and adolescents with anxiety or depression; results indicated significant changes between pretest and posttest measures on seven subscales in the intervention group (social phobia, self-esteem, depression, cognitive schemas, emotional problems, hyperactivity, and total score on the Strengths and Difficulties Questionnaire) versus only three subscales in the control group (physical injury, self-esteem, and cognitive schemas; Stallard, Richardson, Velleman, & Attwood, 2011). In another investigation of TFD, the cCBT program was implemented in schools in two studies, one as a universal intervention and the other as a targeted intervention, both showing preliminary effectiveness of the computerized program on the reduction of anxiety (Attwood, Meadows, Stallard, & Richardson, 2012). A DVD version of TGFG has also been used as a cognitive rehabilitation tool for youth with brain injuries in clinical settings (Tonks et al., 2008).

A number of studies have selected and adapted parts of the TGFG curriculum to use in combination with other program materials to create CBT treatments for a variety of social-emotional-behavioral problems, including intervention packages for children with unusual or “psychoticlike” experiences (Maddox et al., 2013), posttraumatic stress disorder (Nixon, Sterk, & Pearce, 2011), disruptive behavior (Ruttledge & Petrides, 2011; Yeo & Choi, 2008), and for children with learning difficulties and/or motivational and self-esteem difficulties (Toland & Boyle, 2008). Research is needed to evaluate the original TGFG workbook materials, not in combination with other programs or in an adapted computerized or video form. Additionally, research on TGFG specifically relating to student anxiety in schools is also warranted.

Research Gaps

A previous systematic literature review (Erhardt & Miller, 2019) evaluated the effectiveness of school-based anxiety programs in randomized controlled trials (RCT) from 2008 to June 2016 and revealed several important findings. Interventions based partially or wholly in CBT comprised the majority of reviewed interventions (86%), and many reviewed interventions were clearly manualized (82%). The majority of articles in the review did not address social validity, demonstrating a need for increased use of social validity measures in intervention studies. Another notable finding was the general lack of knowledge about student anxiety symptoms at the beginning of the trials highlighting the need for pretest measures that can provide more specific information about anxiety symptom presentation and severity. In addition, this review reflected the need for formative assessment measures to help gauge anxiety reduction and improvement during treatment and to determine student response to intervention beyond pre- and post-intervention measures. In particular, little is currently known regarding how students respond to specific components of CBT. The use of an intervention based on a modularized or common elements approach could allow for more efficient and targeted efforts.

Examination of the literature indicated that much of the overall evidence for school-based anxiety programs came from pre- and post-intervention measures of student anxiety, and the majority of studies utilized group designs. These gaps in the current state of the literature create opportunities to examine the effectiveness of anxiety programs using other rigorous designs, such as single case design (SCD). While group designs have advantages and serve important functions in research, SCD can be beneficial over group design, such as being better able to discriminate between responders and non-responders.

Single case design allows for fewer participants than most group designs and allows for a more in-depth analysis of intervention effects on individual participants with additional practical benefits of reduced resources to implement. Specifically, a multiple baseline SCD helps control for maturation effects which threaten internal validity and also allows for replication across participants. A school-based study using SCD would make a unique contribution to the anxiety intervention literature.

The current study built from previous research (e.g., Erhardt & Miller, 2019; Neil & Christensen, 2009) shifting to an applied focus through the implementation of a CBT-based modularized approach to intervention to address student anxiety in a school setting. The current study aimed to make unique contributions to the literature, including measuring effectiveness of a flexible intervention program, examining particular CBT components in student treatment, and conducting the school-based anxiety intervention in a SCD framework.

Purpose and Research Questions

The purpose of the current study was to investigate the effects of a modularized CBT-based program, and the effects of the CBT components included, on student anxiety through an applied intervention framework in a school setting utilizing a multiple baseline SCD. This intervention study investigated the following research questions: (1) Does a CBT-based modularized approach to intervention, Think Good Feel Good (TGFG), conducted in an elementary school, reduce student anxiety as measured by student, teacher, and parent report on pre- and post-intervention assessments?; (2) Is there a difference in student anxiety in each intervention phase as measured by progress monitoring data using visual and quantitative analytic methods?; and (3) What is the

social validity of the intervention as measured by student self-report? As empirical research for TGFG is particularly limited, results of this study were exploratory and served to determine the potential utility and effectiveness of the intervention and its CBT components. The current study provided an examination of the empirical evidence for TGFG when used as a brief modularized approach to intervention in schools and its application as an anxiety intervention in a SCD framework.

Method

Setting

The current study was conducted in a rural school district in the Midwest region of the United States during the 2017-2018 academic school year. Student participants were enrolled in a public elementary school serving grades kindergarten through fifth grade with the National Center for Education Statistics locale code of Town-Remote. The school had a total enrollment of 972 students that was 51.2% male. The racial/ethnic composition of the school was approximately: 87.3% Caucasian/White, 3.2% Hispanic/Latino, 2.4% African American, 2.3% Asian, and 4.3% Multi-race. At the school level, 55.5% of students qualified for free or reduced-price lunch services and 1.7% were considered Limited English Proficient students.

Participants

Individuals eligible for participation were third, fourth, and fifth grade students with anxiety symptoms observed by teachers or school staff. Specifically, classroom teachers nominated their students for the intervention based on the presence of anxiety concerns and perceived benefit from participation in a small group intervention targeting anxiety. This process took place through structured nominations. Structured nominations

have often been part of screening and student selection processes, such as in the assessment process for the Systematic Screening for Behavior Disorders (Walker, Severson, & Feil, 2014). In the current study, a structured nomination form was developed that operationally defined three observable behaviors indicative of anxiety (social withdrawal, avoidant behavior, anxious distress) to help teachers better understand potential anxiety symptoms of concern for their students. The first author reviewed this form with all teachers and provided the opportunity to discuss it and answer questions before completion. Teachers completed the form to help identify students for possible inclusion in the intervention groups, including information about the nature of student anxiety concerns and the most problematic time those symptoms were observed in the classroom (see Appendix A).

Initially, 19 students were nominated for the intervention, and consent forms were sent home. Of those students, 18 obtained parental consent. Four students who received parental consent were not screened because the group size cap of 6 students was met for fifth grade students; these students were instead referred to the student assistance team. Invitations for intervention participation were provided to a total of 14 students, and all students completed assent forms. Fourteen students in third, fourth, and fifth grades between the ages of 8 and 11 participated in the study. The sample of participants was predominately White (86%), male (71%), and non-Hispanic (100%; see Table 1).

Measures

In line with best practice for measuring internalizing symptoms and social-emotional constructs in children, the current study utilized a multi-source, multi-method approach to determine student response to intervention (Merrell, 1994). Specifically,

three summative rating forms were used for pre/post assessment and two formative assessment forms were used to collect data throughout the intervention. Three informants provided data about student anxiety, including self-report, teacher report, and parent report sources.

Multidimensional Anxiety Scale for Children – 2nd edition. The

Multidimensional Anxiety Scale for Children – 2nd Edition (MASC-2; March, 2013) self-report (MASC-2 SR) and parent (MASC-2 P) rating forms were used to measure student anxiety. The MASC-2 is a 50-item rating scale that is appropriate for assessing children and adolescents ages 8 to 19 years and was developed as a revision of the original MASC (March, 1997). Participants are asked to rate how often statements corresponding to thoughts, feelings, and behaviors are true about themselves or their child. The MASC-2 measures cognitive, physical, emotional, and behavioral symptoms of anxiety across a Total Score scale and six subscales related to anxiety disorders, including Separation Anxiety/Phobias, Generalized Anxiety Disorder (GAD), Social Anxiety, Obsessions and Compulsions, Physical Symptoms (PS), and Harm Avoidance.

Primary outcomes utilized in the current study included the GAD and PS subscales; those two subscales were selected because they more closely aligned with the TGFG intervention content and represented symptoms where anxiety improvement might be expected, versus other subscales that related to more clinical anxiety issues such as obsessions, phobias, etc. that were not a focus of the intervention. The GAD index includes “symptoms similar to youth diagnosed with Generalized Anxiety Disorder, including elevated worry about future events and associated physical symptoms” and the PS scale includes “physical symptoms including those related to panic and feelings of

being tense or restless” (p. 26, March, 2013). Overall, internal consistency for the MASC-2 P is adequate ($\alpha = 0.89$) and internal consistency for the MASC-2 SR is strong ($\alpha = 0.92$) with both forms demonstrating strong test-retest reliability (Fracaro, Stelnicki, & Nordstokke, 2015; March, 2013). Cronbach's alpha was used to report internal consistency for the GAD and PS scales with the total normative sample on the MASC-2 self-report and parent report forms (March, 2013). The GAD index reported reliability coefficients of 0.72 on MASC-2 SR and 0.66 on MASC-2 P. The Physical Symptoms scale reported alpha coefficients of 0.88 on the MASC-2 SR and 0.83 on the MASC-2 P. There is acceptable to strong evidence for discriminative, convergent, and construct validity of the measure (Fracaro, Stelnicki, & Nordstokke, 2015; March, 2013).

Teacher’s Report Form – Anxiety. The Teacher Report Form-Anxiety (TRF-A; Kendall et al., 2007) was used to measure student anxiety via teacher report. The TRF-A is an abbreviated and targeted measure developed from the Teacher Report Form (TRF; Achenbach & Rescorla, 2001), which is a 113-item assessment that measures several areas of student social, emotional, and behavioral functioning, including subscales aligned with the Diagnostic and Statistical Manual. The complete TRF assessment has demonstrated good internal consistency ($\alpha = 0.72$ to 0.97) and test-retest reliability and strong evidence for criterion-related validity (Bordin, et al., 2013; Achenbach & Rescorla, 2001).

The TRF-A was selected for use in the current study because it focuses exclusively on capturing a range of anxiety symptoms, is much shorter than the full-length TRF, and has been recommended for use in the literature for both clinical and research purposes (Kendall et al., 2007). The TRF-A is comprised of 18 items, including

items that capture physiological, cognitive, and behavioral features of anxiety. Teachers are asked to rate how much statements about anxiety apply to the student using a 3-point scale (0 = Not True, 1 = Somewhat or Sometimes True, and 2 = Very True or Often True). Psychometrically, the TRF-A has correlated significantly with other anxiety measures, including the children's Negative Affectivity Self-Statement Questionnaire ($r = 0.30, p < .01$), the Revised Children's Manifest Anxiety Scale ($r = 0.27, p < .01$), and the Multidimensional Anxiety Scale for Children ($r = 0.20, p < .01$; Kendall et al., 2007). The TRF-A has also demonstrated treatment sensitivity within clinical samples, finding significant reductions in anxiety as measured by the TRF-A between pretreatment ($M = 12.45, SD = 5.60$) and posttreatment ($M = 6.03, SD = 5.33$) and waitlist scores showing no significant change (Kendall et al., 2007).

Subjective Units of Distress. Subjective Units of Distress (SUDS) was used to measure student self-reported feelings of anxiety. Individuals using SUDS are asked to rate their feelings on a numerical scale to capture their degree or level of experienced distress. SUDS measures can be used with children, adolescents, and adults to rate varying feelings, such as anxiety, fear, or anger. Typically, SUDS measures used with children use a smaller numerical scale (e.g., 1 to 5 or 1 to 10), incorporate qualitative and sometimes personalized descriptors of each anchor on the scale, and are presented visually, such as through a feelings thermometer or accompanying pictures at each anchor point. In the current study, a SUDS scale was constructed for students using a 0 to 10 scale with a rating of 0 signifying "No worry, totally relaxed" and a rating of 10 signifying "Highest worry you have ever felt" using a feelings thermometer format (see Appendix B). The SUDS measure captured student-reported level of anxiety.

Direct Behavior Ratings. Direct Behavior Ratings (DBR) were used to measure student anxiety based on teacher report. DBRs are an alternate way of measuring student behavior that “capture[s] the strengths of behavior rating scales and the benefits of systematic direct observation” (Chafouleas, Riley-Tillman, & Christ, 2009, p. 195). DBRs ask informants to directly assess and rate operationalized and observable student behaviors during a specific observation period, reflecting short latency and lower inference (Christ, Riley-Tillman, & Chafouleas, 2009). DBR measures allow for greater flexibility and repeatability making them a good candidate for measuring behavior formatively and using them to monitor the effects of intervention supports (Riley-Tillman, Chafouleas, Sassu, Chanese, & Glazer, 2008). Studies have examined the psychometric quality of DBR, finding significant agreement and demonstration of concurrent validity for three core behavioral targets between DBR and systematic direct observation measures (e.g., Chafouleas, McDougal, Riley-Tillman, Panahon, & Hilt, 2005; Riley-Tillman et al., 2008) and support for the consequential validity of DBRs for monitoring of interventions (Christ, Nelson, Van Norman, Chafouleas & Riley-Tillman, 2014). DBR measures also have established reliability across raters (Harrison, Riley-Tillman, & Chafouleas, 2014).

While DBR measures have traditionally collected data on three core behaviors relating to disruption, respectfulness, and academic engagement, research has adapted and explored their utility for measuring internalizing problems. One study used a teacher-completed DBR-Multiple Item Scale as a daily progress monitoring tool for a Check-In-Check-Out intervention to rate student internalizing concerns that were individualized and operationalized based on student screening data (Dart et al., 2015). In another study,

von der Embse, Scott, and Kilgus (2015) examined the sensitivity to change and concurrent validity of self-reported DBR-Single Item Scale for measuring academic anxiety in a sample of undergraduate students at three time points before, during, and after an anxiety provoking event, finding moderate yet significant results to support concurrent validity. In the current study, teacher-rated DBRs for student anxiety (DBR-A; Miller, 2017) were used, targeting observable behaviors relating to anxiety using a 0 to 10 numerical rating scale. Three single item scales were used on the DBR-A form to assess observable indicators of student anxiety. These single item scales were: social withdrawal (DBR-SW), avoidant behavior (DBR-AB), and anxious distress (DBR-AD), which are each operationally defined with behavioral descriptors and examples included at the top of the DBR-A form (see Appendix C).

Social validity measure. After completion of the intervention, students were asked a series of questions about the intervention and their experiences using an informal rating form (see Appendix D). Students were asked to rate four statements on a scale of 1 (I really disagree) to 4 (I really agree). Students either completed the ratings independently or the interventionist read the statements aloud and the participants recorded their ratings privately. The interventionist read the students four interview questions to gather narrative feedback about the intervention and allowed students to complete these answers independently. All feedback forms were completed in a one-on-one setting between the interventionist and student so other students would not influence their responses. Answers to these questions were used to assess the social validity of the intervention and inform the qualitative content of the study.

Fidelity of implementation measure. Throughout the TGFG intervention, in all

treatment phases, fidelity of implementation was measured. Fidelity was measured with an implementation checklist constructed to assess the intervention's critical components and ensure consistency and accuracy in program delivery between intervention groups. The checklist included components that assessed adherence to program materials and alignment to the general session structure (see Appendix E). This measure was completed at the end of each intervention session for each group by the first author/interventionist. The mean percentage of fidelity was 100%.

Intervention Program

A subset of TGFG materials was selected for use in the current study to create a brief (6-week, 12-session) modularized intervention to use with middle to upper elementary school-aged students with the aim of reducing student anxiety. Four lesson plans were created for each of three major components of CBT, psychoeducation, somatic management, and cognitive restructuring in alignment with Velting et al.'s (2004) definitions of CBT components for anxious youth. The CBT components also represented the three most commonly utilized in anxiety interventions from previous research (Erhardt & Miller, 2019). Each CBT component formed one of the intervention treatment phases. Table 2 provides the overall lesson plan for the developed TGFG intervention program.

Procedures

The current study received ethical approval from the University of Minnesota's Institutional Review Board and formal approval from the local school district where the study was conducted. Study recruitment occurred in October 2017. Materials explaining the study were provided to students, families, and teachers, and forms were sent home

with students for completion by parent or guardian and returned to the school. Written parent consent and student assent were obtained prior to participation in the intervention study. Student participation in the study was voluntary. Students were told that their answers on questionnaires and rating forms would be kept confidential and that they could choose to leave the intervention group at any time. Students were excluded from the study if they were: (a) chronically absent; (b) were receiving another social-emotional-behavioral intervention at school; or (c) were receiving outside supports or services for anxiety. Training procedures for teachers were carried out prior to the start of the study, which consisted of explaining the purpose, providing expectations, and demonstrating the use of the DBR-A measure for teachers and the SUDS measure for students. Teachers received information about the SUDS measure to help support their students in its use.

Pre- and post-intervention measures. As pre-intervention measures, the MASC-2 SR was completed by students, the MASC-2 P by parents or guardians, and the TRF-A by classroom teachers during the week prior to the start of baseline. Students with a t-score of 60 or higher on the MASC-2 SR total anxiety scale or on one of the anxiety subscales were considered to have elevated levels of anxiety, indicating scores outside the average range of functioning, and thus were included in the study and served to verify teacher nomination. The purpose of collecting pre-intervention data was to capture the nature and intensity of student anxiety symptoms and concerns. As post-intervention measures, each of the three assessments was administered again one week after the conclusion of the intervention. Collecting post-intervention data allowed for comparison with the pre-intervention data and provided an avenue for exploring anxiety reduction

and symptom improvement. In addition, students at post-intervention also completed a social validity measure to share their thoughts about the intervention and how they perceived it helped them.

Intervention implementation. The TGFG intervention groups were conducted by the first author, a female doctoral candidate in school psychology and also an employed school psychologist at the elementary school site. Students met in 3 small groups by grade twice per week for 30-minute sessions over the duration of the 6-week TGFG program. There were a total of 12 intervention sessions plus a closing session where end of group activities were conducted. Each session corresponded to a pre-determined lesson plan, as noted previously (see Table 2). Lessons implemented in each intervention group followed the same general structure or format during every session: (a) greeting/welcome, (b) student check-in (rapport and group building), (c) recap previous session, (d) introduce session topic, (e) present lesson content, (f) practice via worksheet or activity, (g) group share, and (h) closing summary (what we did, what we practiced, what to do for next lesson). The interventionist met with groups during the regular school day in a quiet and private room at the school with minimal distractions.

Design and Conditions

The current study used SCD methodology with pre- and post-assessments of anxiety as summative outcome measures. Specifically, a concurrent multiple baseline design across intervention groups was implemented within the context of a multi-component design, wherein baseline was followed by three treatment phases comprising the CBT intervention: baseline (phase A), psychoeducation (phase B), somatic management (phase C), and cognitive restructuring (phase D). Participants were assigned

to groups based on their grade due to logistic constraints. There were 6 students in the fifth grade group, 4 students in the fourth grade group, and 4 students in the third grade group. A cap of 6 students was set to ensure that each student in a group would be able to receive intervention content as designed without sessions being rushed or the quality of sessions compromised. Formative assessments (SUDS and DBR-A) were completed throughout all phases of the study.

Baseline. The baseline phase consisted of at least three teacher-completed DBR-A forms and three student self-completed SUDS measures. Baseline measures were to be collected once daily for one to three weeks prior to the start of the intervention, depending on intervention group. Teachers rated students on the percentage of time they showed anxious behaviors during a time period teachers previously reported as most problematic for the student on the DBR-A form. Students self-rated their level of anxiety daily during the middle of the school day on the SUDS form. Baseline took place over one week for the fifth grade group, two weeks for the fourth grade group, and three weeks for the third grade group.

Intervention. During the intervention phases, students followed the aforementioned TGFG lesson sequence as led by the interventionist in a small group setting. Psychoeducation served as the foundational CBT component of the intervention sequence followed by delivery of somatic management and cognitive restructuring in subsequent phases, moving from more concrete to abstract components. Within sessions, students completed worksheets or activities aligned with lesson content. Students and teachers continued to rate anxiety daily on SUDS and DBR-A forms. Each intervention phase had a two-week duration and comprised of four sessions each.

Analysis Plan

Of the 14 total intervention participants, the final analytic sample was comprised of 11 students. Two students were excluded from analyses due to poor intervention attendance (missed $\geq 25\%$ of sessions): student 5E was ill during the beginning of the intervention period and missed 3 intervention sessions, while student 4D had irregular attendance during intervention and sometimes chose not to attend group, missing 4 intervention sessions. Student 5F was excluded from analyses due to missing data, specifically not recording the minimum number of self-reported SUDS data points during baseline. Therefore, the analytic sample included 4 fifth grade students, 3 fourth grade students, and 4 third grade students.

Pre- and post-intervention measures. Pre- and post-intervention measures were compared for the TRF-A and for MASC-2 SR and MASC-2 P. Mean differences were analyzed for statistical significance using paired samples t-tests ($\alpha = .05$).

Progress monitoring measures. Results from progress monitoring measures, DBR-A and SUDS forms, were analyzed using visual and quantitative analytic methods. Groups and individuals both served as units of analysis in the study, wherein baseline (phase A) was compared to intervention conditions (phases B, C, and D). Consistent with best practices, visual analysis included the examination of data in relation to changes in level, trend, variability, overlap, and immediacy of effect (Kratochwill et al., 2010). Quantitative analysis included effect size calculations using both within- and between-case effect size estimates: τ_{novlap} (Parker, Vannest, Davis, & Sauber, 2011) and a *d*-statistic for single case design (Shadish, Hedges, & Pustejovsky, 2014).

Social validity. At the conclusion of the intervention, students completed

intervention feedback forms which included ratings and interview questions. Data collected from these forms were used to ascertain social validity of the TGFG intervention group, including information about acceptability, perceived usefulness, and general comments.

Results

The purpose of the current study was to examine the effects of a modularized CBT-based intervention on student anxiety using pre/post intervention data and progress monitoring data in a single case design framework. The following research questions were investigated: (1) Does a CBT-based modularized approach to intervention, Think Good Feel Good (TGFG), conducted in an elementary school, reduce student anxiety as measured by student, teacher, and parent report on pre- and post-intervention assessments?; (2) Is there a difference in student anxiety in each intervention phase as measured by progress monitoring data using visual and quantitative analytic methods?; and (3) What is the social validity of the intervention as measured by student self-report?

Pre/Post Intervention Data

To address the first research question, pre/post intervention data were collected across three respondents using questionnaires to assess anxiety, including the MASC-2 SR, MASC-2 P, and TRF-A. Table 3 provides the pre- and post-intervention data for student, teacher, and parent respondents on each assessment measure. The current study sought a subclinical sample of students with mild to moderate symptoms of anxiety. Nominated students were administered the MASC-2 SR to verify symptom presence and capture the nature of anxiety concerns. Analysis of the pre-intervention results on the Generalized Anxiety Disorder (GAD) and Physical Symptoms (PS) scales indicated that

five students in the analytic sample had t-scores in the very elevated range on at least one of the scales, indicating many more concerns than are typically reported. Thus, the sample contained a mix of participants with subclinical and potentially clinical anxiety symptoms as measured through self-report. However, there were no reported anxiety disorder diagnoses for student participants.

Analysis of the student self-report data indicated that all students improved on at least one of two anxiety subscales, GAD or PS, on the MASC-2 SR. Seven students demonstrated anxiety improvement on both MASC-2 subscales (64%). Of the four students who did not show improvement in anxiety symptoms on one scale, two students showed a slight increase in anxiety and two students showed no change. To assess the significance of the self-report pre/post data on the MASC-2, paired samples t-tests were performed on the GAD and the PS subscales. Results indicated there were statistically significant differences in anxiety symptom reduction by pre-intervention and post-intervention scores on the GAD subscale ($t(10) = 3.12, p = 0.011$) and on the PS subscale ($t(10) = 2.57, p = 0.028$). Supplemental pre/post assessment data were collected from parents and teachers to augment self-report data and determine if other respondents noted differences in student anxiety across classroom and home settings. Parent data on the MASC-2 P indicated that eight students (73%) exhibited anxiety improvement on at least one of the two anxiety subscales. Teacher data on the TRF-A indicated that four students (36%) showed anxiety improvement, two showed no improvement, and five showed a slight to moderate increase in anxiety.

Progress Monitoring Data

To address the second research question, progress monitoring or formative data

were collected throughout the intervention by student participants on the SUDS form and by classroom teachers on the DBR-A form. Analytic emphasis was given to the self-report data given the nature of reporting emotional states and internalizing symptoms such as anxiety. Teacher-reported DBR-A data served to augment or supplement the student self-report SUDS data.

SUDS data. Data from the SUDS rating forms were examined through visual analyses and quantitative methods. Analyses were conducted at both the individual and group level for participants in the analytic sample. Figures 1, 2, and 3 show individual SUDS data grouped by grade. Table 4 reports SUDS mean scores by intervention group and by individual across intervention phases.

Individual visual analysis. During baseline (phase A), student 5A had an average anxiety rating of 3 and an increasing trend. At the start of intervention (phase B), student 5A showed a decrease in anxiety with an average of 2.6, followed by an increase to 3.2 in phase C, and a decrease to 2.17 in phase D. Across phases BCD, student 5A showed an overall decelerating trend with an average rating of 2.62 indicating an overall decrease in reported anxiety from baseline to intervention.

During baseline, student 5B had an average anxiety rating of 5.2 and a slight decelerating trend. At the start of intervention, student 5B showed a slight increase in anxiety with an average of 5.38, followed by a decrease to 4.38 in phase C, and a decrease to 3 in phase D. Across phases BCD, student 5B showed an overall decelerating trend with an average rating of 4.43 indicating an overall decrease in reported anxiety from baseline to intervention.

During baseline, student 5C had an average anxiety rating of 1.2 and a

decelerating trend. At the start of intervention, student 5C showed an increase in anxiety with an average of 2.11, followed by an increase to 2.71 in phase C, and a decrease to 1.4 in phase D. Across phases BCD, student 5C showed an overall decelerating trend with an average rating of 2.14 indicating an overall increase in reported anxiety from baseline to intervention.

During baseline, student 5D had an average anxiety rating of 0.4 and a decelerating trend. Student 5D reported anxiety scores of 0 for all but one data point across all four phases. Across phases BCD, student 5D showed a zero-celerating trend with an average rating of 0 indicating an overall slight decrease in reported anxiety from baseline to intervention. Student 5D averaged ratings of 0 across intervention phases, suggesting a potential floor effect.

During baseline, student 4A had an average anxiety rating of 2.1 and a slight increasing trend. At the start of intervention, student 4A showed an increase in anxiety with an average of 4.5, followed by a decrease to 0.5 in phase C, and a very slight increase to 0.55 in phase D. Across phases BCD, student 4A showed an overall decelerating trend with an average rating of 1.48 indicating an overall decrease in reported anxiety from baseline to intervention.

During baseline, student 4B had an average anxiety rating of 2.7 and a decreasing trend. At the start of intervention, student 4B showed a decrease in anxiety with an average of 0.43, followed by an increase to 1.33 in phase C, and an increase to 2.3 in phase D. Across phases BCD, student 4B showed an overall increasing trend but had an average rating of 1.46 indicating an overall decrease in reported anxiety from baseline to intervention.

During baseline, student 4C had an average anxiety rating of 5.31 and an increasing trend. At the start of intervention, student 4C showed a decrease in anxiety with an average of 2.4, followed by an increase to 3.86 in phase C, and a decrease to 1 in phase D. Across phases BCD, student 4C showed an overall decelerating trend with an average rating of 2.69 indicating an overall decrease in reported anxiety from baseline to intervention.

During baseline, student 3A had an average anxiety rating of 5.73 and a decreasing trend. At the start of intervention, student 3A showed a decrease in anxiety with an average of 4.83, followed by a decrease to 4.6 in phase C, and an increase to 6 in phase D. Across phases BCD, student 3A showed an overall increasing trend but had an average rating of 5.3 indicating an overall decrease in reported anxiety from baseline to intervention.

During baseline, student 3B had an average anxiety rating of 1 and a decelerating trend. At the start of intervention, student 3B showed an increase in anxiety with an average of 1.17, followed by a decrease to 1 in phase C, and an increase to 1.33 in phase D. Across phases BCD, student 3B showed an overall slight increasing trend with an average rating of 1.2 indicating an overall increase in reported anxiety from baseline to intervention.

During baseline, student 3C had an average anxiety rating of 2.21 and a near zero-celerating trend. At the start of intervention, student 3C showed an increase in anxiety with an average of 2.5, followed by a decrease to 1.75 in phase C, and an increase to 5 in phase D. Across phases BCD, student 3C showed an overall increasing trend with an average rating of 3.43 indicating an overall increase in reported anxiety from baseline to

intervention.

During baseline, student 3D had an average anxiety rating of 0 and a zero-celerating trend. Student 3D reported anxiety scores of 0 across phases B and C, and in phase D increased to an average of 0.36. Across phases BCD, student 3D showed an overall slight increasing trend with an average rating of 0.17 indicating an overall slight increase in reported anxiety from baseline to intervention. Student 3D averaged ratings of 0 across baseline and two intervention phases, suggesting a potential floor effect.

Summary: Individual visual analysis. Through individual visual analyses, none of the student participants demonstrated strong evidence of immediacy of effect. For most individuals in most phases, data were generally variable with a high degree of overlap across phases. Overall, when examining response to intervention through mean level change from baseline to combined intervention phases, seven students decreased their anxiety – students 5A, 5B, 5D, 4A, 4B, 4C, and 3A.

Group visual analysis. The fifth grade group was comprised of four students in the analytic sample. During baseline, the group demonstrated an average anxiety rating of 2.45 on the SUDS self-report data. The first four data points showed an increasing trend in anxiety ratings with the fifth data point showing minimal anxiety. To note, the fifth data point was collected after spring break where students were absent for multiple school days. Overall, there was a decelerating trend in Phase A. Student reported anxiety ratings in Phase B maintained level with an average of 2.48, decreased to an average of 2.27 in Phase C, and decreased in Phase D to an average of 1.09. Across the BCD intervention phases, the fifth grade group showed a decelerating trend indicating an overall reduction in anxiety symptoms during intervention.

The fourth grade group was comprised of three students in the analytic sample. During Phase A, the group demonstrated an average anxiety rating of 3.27 on SUDS forms. Baseline data was variable and overall there was a near zero-celerating trend. Student reported anxiety ratings in Phase B decreased to an average of 2.36, decreased in Phase C to an average of 1.85, and continued to decrease in Phase D to an average of 1.30. Across the intervention phases, the fourth grade group showed a decelerating trend indicating an overall reduction in anxiety symptoms during intervention.

The third grade group was comprised of four students in the analytic sample. In Phase A, the group recorded an average anxiety rating of 2.08 on SUDS forms. Baseline data was variable and overall there was a decelerating trend. Anxiety ratings increased slightly during Phase B to an average of 2.14, decreased to an average of 1.56 in Phase C, and increased to an average of 3.19 in Phase D. Across the intervention phases, the third grade group showed an increasing trend indicating an overall increase in anxiety symptoms during intervention.

Summary: Group visual analysis. Visual inspection of the group data suggested that none of the groups demonstrated strong evidence of immediacy of effect when examining the last three data points in the preceding phase with the first three data points in the following phase. For the majority of groups in most phases, data were generally variable with a high degree of overlap across phases. Overall, when examining response to intervention through mean level change from baseline to combined intervention phases, the fifth grade and the fourth grade groups demonstrated anxiety improvement.

Within-case effect size estimates. SUDS data were also examined using within-case effect size estimates. The τ_{novlap} statistic (Parker, Vannest, Davis, & Sauber, 2011)

provided opportunity to examine how individual intervention phases impacted the SUDS progress monitoring data using phase contrasts. The Tau_{novlap} statistic is “based on all pairwise data comparisons made in a time-forward direction” and is conceptualized as “the percentage of nonoverlap minus overlap” (p. 313, Parker, Vannest, & Davis, 2011). The statistic was calculated using the online Tau-U calculator through the Single Case Research organization (Vannest, Parker, Gonen, & Adiguzel, 2016). Tau_{novlap} for phase contrasts was calculated for adjacent phases for each student: Phase A to B, B to C, C to D, and A to BCD along with weighted averages for each phase contrast for each group to estimate effect size by grade. Baseline data was examined to determine if a significant baseline trend was present prior to calculation, and only student 5B on the phase C to D contrast needed a corrected/controlled baseline for calculation. Statistical results are presented in Table 5, documenting the Tau_{novlap} statistic, percentile rank estimates (Parker, Vannest, & Davis, 2011), and p values for the student self-reported SUDS data.

Results for fifth grade students indicated that there were no statistically significant improvements in anxiety symptoms on phase contrasts across individuals or the group. Results for fourth grade students demonstrated statistical significance in one phase contrast for each individual: phase contrast B-C for student 4A ($Tau_{\text{novlap}} = -0.67$, $p = 0.039$), phase contrast A-B for student 4B ($Tau_{\text{novlap}} = -0.64$, $p = 0.028$), and phase contrast A-BCD for student 4C ($Tau_{\text{novlap}} = -0.54$, $p = 0.035$), indicating statistically significant reductions in anxiety ratings across these phase contrasts for these individuals. The weighted average for the fourth grade group for phase contrast A-BCD showed statistically significant improvement in anxiety symptoms ($Tau_{\text{novlap}} = -0.36$, $p = 0.007$). Results for the third grade group revealed statistically significant increases in anxiety on

the C-D phase contrast for student 3A at the individual level ($Tau_{\text{novlap}} = 0.69, p = 0.039$) and for the weighted average at the group level on the C-D phase contrast ($Tau_{\text{novlap}} = 0.39, p = 0.013$). At the group level, Tau_{novlap} estimates were generally small, between the 10th and 25th percentile according to interpretive guidelines (Parker, Vannest, & Davis, 2011), and were not statistically significant in all but two contrasts. At the individual level, Tau_{novlap} estimates were generally small to moderate, often between the 10th and 50th percentiles (Parker, Vannest, & Davis, 2011), with a few instances of statistical significance.

Specific components of CBT did not appear to improve anxiety significantly when examining Tau analyses for SUDS data across phase contrasts. Specifically, examining baseline to the first intervention phase, the psychoeducation CBT component, only one student (4B) at the individual level demonstrated a statistically significant reduction in anxiety. Similarly, only one student (4A) significantly reduced anxiety from the psychoeducation phase to the second intervention phase, the somatic management CBT component. When analyzing the contrast between the somatic management phase and the final intervention phase, the cognitive restructuring CBT component, one student (3A), as well as the third grade group overall, demonstrated a statistically significant increase in anxiety. Analyzing the phase contrast between baseline and combined intervention phases, results indicated a significant reduction in anxiety for one individual (4C) and for the fourth grade group overall. Examining across intervention phases at both the individual and group levels, there did not appear to be a clear or consistent pattern that indicated a significant reduction or increase in student anxiety using SUDS data by CBT component.

Between-case effect size estimates. SUDS data were also analyzed using between-case effect size estimates. The *d*-statistic (Shadish, Hedges, & Pustejovsky, 2014) was calculated for overall effects to examine if the SUDS data suggest the TGFG intervention was effective in reducing student anxiety. This statistic is the Hedges' *g* effect size estimate corrected for small sample bias and appropriate for use with single case design studies (Shadish, Hedges, & Pustejovsky, 2014). The calculation was run in the International Business Machines Corporation's (IBM) Statistical Package for the Social Sciences (SPSS) Version 25. Results for the overall analytic sample indicated a minimal effect ($G = 0.12$, CI (95%) = -0.11, 0.35). The *d*-statistic was also calculated by intervention group. The fifth grade group did not show a discernable effect ($G = 0.05$, CI (95%) = -0.43, 0.52) nor did the third grade group ($G = -0.09$, CI (95%) = -0.36, 0.18). The fourth grade group demonstrated a statistically significant medium effect ($G = 0.55$, CI (95%) = 0.05, 1.05).

DBR-A data. Teacher-reported ratings for student anxiety using the DBR-A form were used to supplement SUDS data for individual student responders. On the DBR-A form, the Anxious Distress (AD) scale was reported as most problematic by teacher rating for six of the seven responders during baseline. Social Withdrawal (SW) was reported as most problematic for the seventh student. Five of seven responders to intervention demonstrated anxiety improvement on their targeted anxiety scale when examining the mean difference between baseline and intervention phases – Phase A and BCD. Of the four non-responders, three of the four students had anxiety improvements reported by teachers from phases A to BCD. Table 6 reports baseline and intervention phase DBR-A mean scores for the anxiety behavior deemed most problematic for

participants.

Social Validity Data

To address the third research question, data were collected from intervention feedback forms completed by student participants. All eleven students in the analytic sample agreed that they liked the intervention group and they would keep using the things they learned in group. Ten students agreed that the group helped them and they would suggest the group to friends. Table 7 displays the quantitative data collected on the intervention feedback form. Additional qualitative data indicated that many students enjoyed hanging out with new people as well as sharing their emotions and the things happening in their lives with each other. Some students shared that they wanted to meet more often or for longer sessions. Some students reported that they felt the group helped them become more open or deal with their anger. Student comments about how the group helped them included: “it helped me think of calming things”, “it helped me find new ways to relax”, “I use the stretches when I have time to do them”, “I know new breathing exercises when I’m stressed”, and “when upset [I] use my safe place.”

Discussion

Implementing interventions at school that help students with anxiety issues can provide support and care for a common problem among youth that often has negative effects on health and wellbeing. Previous research regarding the implementation of CBT-based interventions in schools has often demonstrated positive effects and reduction of anxiety for youth (e.g., Mychailyszyn, Brodman, Read, & Kendall, 2012). However, a review of research pertaining to modularized anxiety interventions in schools and specifically the TGFG intervention was limited and warranted further investigation. The

purpose of the current study was to examine the effect of a low-cost, brief, modularized intervention program, TGFG, on student anxiety in elementary school. The study built from previous research (e.g. Erhardt & Miller, 2019) by collecting formative assessment data in addition to pre/post assessment data, gathering student-reported social validity data, and implementing the intervention in a single case design framework.

Pre/post intervention assessment data supported self-reported anxiety improvement in student participants in the TGFG intervention, as all students reported anxiety improvement on one of two MASC-2 subscales with the majority improving on both subscales. Positive effects on this measure indicated a reduction in symptoms relating to excessive or persistent worry and physical symptoms, such as feeling tense, on edge, or restless. The participant sample consisted of a mix of students with self-reported subclinical and/or potentially clinical anxiety symptoms. No students had diagnoses of an anxiety disorder or were receiving outside supports for anxiety; thus participants were likely experiencing subclinical anxiety symptoms or undiagnosed anxiety disorders, helping to address the identified treatment gap for youth with anxiety problems (e.g. Merikangas et al., 2011). These results indicated initial support for TGFG effectiveness as a school-based anxiety intervention using original materials with students experiencing anxiety symptoms in elementary school and relate to previous research demonstrating effectiveness of CBT-based school interventions for clinical and subclinical anxiety (e.g. Pereira, et al., 2014; Bouchard, et al., 2013). Results from the TGFG original intervention materials tie into preliminary results of the computerized adaptation of TGFG, Think Feel Do, showing reduced social phobia and general anxiety (Stallard, et al. 2011; Attwood, et al. 2012).

Self-report measurement of internalizing issues and social-emotional constructs tend to produce more accurate estimates that are often able to better capture internal symptoms due to the covert nature of symptoms (March, 2013), so analytic emphasis in the current study was first given to the self-report measures with teacher and parent reported measures used to augment findings. Using a multi-method, multi-source approach aligned with best practice approaches (Merrell, 1994). Parent-reported MASC-2 scores indicated that eight participants improved on at least one anxiety subscale and teacher-reported TRF-A scores indicated improvement for four students. Taken together, the greatest reductions in anxiety were reported by students, with some reductions reported by parents and fewer reductions reported by teachers using pre/post assessment data. The self-report and parent report pre/post measures came from the same anxiety assessment suite, MASC-2, and allowed for comparisons between scores; however, there is an identified need to develop teacher reported anxiety ratings that align with other respondent forms. When looking across the literature, the vast majority of reviewed trials in Erhardt and Miller (2019) and in Neil and Christensen (2009) utilized self-report measures of anxiety and few used parent or teacher reported measures, another area to address in research.

The TGFG intervention aligned with identified essential components of CBT for youth with anxiety (Velting, Setzer, & Albano, 2004), with intervention content focused on three particular components, including psychoeducation, somatic management, and cognitive restructuring. These components were identified as the three most common CBT components of school-based anxiety programs in a previous systematic literature review (Erhardt & Miller, 2019). The current study made an effort to examine if there

were any differences in anxiety based on intervention phase corresponding to these three components, attempting to build on component analysis research conducted mainly with adults with diagnosed internalizing disorders in clinical settings (e.g., Borkovec, Newman, Pincus, & Lytle, 2002; Jacobson et al., 1996). Students in elementary school with no internalizing diagnoses were the sample of interest in the current study. Results from visual analyses suggested the majority of participants improved overall when examining mean level SUDS changes from baseline to combined intervention phases, but there was limited evidence to support phasic differences through visual analysis or within-case effect size estimates.

Findings from between-case effect size estimates using the *d*-statistic for single case design indicated a statistically significant medium positive effect of the TGFG intervention for the fourth grade group using SUDS data ($G = 0.55$), but did not support effects for the overall analytic sample or for the fifth and third grade groups ($G = -0.09$ to 0.12 ; positive indicating anxiety reduction). The between-case effect size G is comparable to group effect size, allowing comparison between the current study and previously reviewed literature. In a recent review of RCTs for school-based anxiety interventions, Erhardt and Miller (2019) found small to moderate effect sizes for studies with significant anxiety reduction ($ES = -0.69$ to -0.15 ; negative indicating anxiety reduction) tying into the current study findings. While some of the effect sizes in these studies are interpreted as small, many interventions had a prevention focus, and findings from these studies can still have meaningful impacts in anxiety prevention research (Werner-Seidler, Perry, Callear, Newby, & Christensen, 2017).

The current study collected social validity data from student participants

addressing an identified need in school-based anxiety intervention research. Previous reviews of the literature demonstrated that fewer than one-third of trials in Erhardt and Miller (2019) and fewer than one-fifth of trials in Neil and Christensen (2009) collected social validity information. Collectively in the current study, participants in the TGFG intervention reported that they liked the group, found it helpful, would suggest it to friends, and would continue to use things they learned. Given this sample of students, the TGFG intervention appeared to have high acceptability and perceived utility. Overall, these study findings presented some initial buy-in for the TGFG intervention and the CBT components and activities focused on using the original workbook materials in schools.

Study Strengths

There were many strengths in the current study. One set of strengths was that the study made a unique contribution to the research literature by examining the effectiveness of TGFG as a modularized, brief intervention and by collecting formative, progress monitoring data in a SCD framework. Previous research only examined TGFG in a modified or adapted format or in conjunction with other intervention materials (e.g., Stallard, Richardson, Velleman, & Attwood, 2011; Ruttledge & Petrides, 2011) indicating a need for effectiveness studies based on the standalone original TGFG materials. In addition, many reviewed anxiety intervention studies utilized mainly pre/post assessment data in group designs presenting the opportunity to explore anxiety intervention studies with different methodological designs and approaches. Another strength of the current study was utilizing both quantitative and visual analyses methods, blending statistical and analytical approaches, and allowing for in-depth analyses. The

study also utilized a multi-method, multi-source framework, in line with best practices, by collecting data from a variety of respondents on different assessment tools to acquire anxiety information across home and school settings. Given limited social validity data for school-based anxiety interventions, students in the current study were asked for data in this area to explore the perceived acceptability and utility of the TGFG intervention, key components for student buy-in. Additionally, this exploratory study presented the SUDS rating form as a way to capture progress monitoring data for internalizing symptoms in SCD. Research has been limited on acceptable, ongoing formative assessments for self-report measurement of emotional states and internalizing symptoms (Dart, Arora, Collins, & Doll, 2018). Lastly, the current study sought to determine if young students responded better to particular CBT components, exploring effectiveness of components in an area with limited research.

Limitations and Future Research

There were limitations in the current study that should be considered when interpreting results and generalizing study outcomes, alongside implications for future research in the field of anxiety. Some limitations in the current study related to settings and participants. The intervention took place in the spring near the end of the school year. At times, this created scheduling challenges to meet with student groups as designed and it also affected student and teacher reported progress monitoring data due to spring break, field trips, and end of the year activities during data collection. An additional limitation was that 14 students participated in the intervention study, but only 11 were included in the analytic sample due to students missing more than two intervention sessions or having too much missing data based on predetermined guidelines. There were also

students who were nominated for participation in the intervention study by their teachers and received parental consent, but were not included in the study sample due to scheduling limitations and the intervention group size capped at six students. The names of the four students who did not participate were provided to the school counselor and student assistance team for additional support due to logistical constraints of creating two fifth grade groups and due to the fact that there would not be time to work with them after the current study ended before the end of the school year.

Additional limitations pertain to some of the assessment tools utilized in the study. Currently, no validated formative assessment tools have been developed for children with pre-clinical levels of anxiety. The SUDS rating form that was used as an intervention progress monitoring tool for self-reported anxiety was author-created but based on general guidelines and adaptation suggestions for use with children. SUDS were selected because it was predicted to be intuitive and easy to use for the young participants and allowed for adaptability specific for the study purpose. It is possible other measurement tools used for progress monitoring may have yielded different results or performed differently than the SUDS data did in the current study. Further, the TRF-A assessment form was a shortened version of the existing TRF form focusing solely on questions related to anxiety. While there is some evidence for its psychometric adequacy and treatment sensitivity for youth in clinical samples (Kendall et al., 2007), additional research should be conducted to ascertain its use with non-clinical samples. A few questions teachers reported on for student anxiety on the TRF-A were not well aligned with the identified MASC-2 scales that students and parents completed. That is, clinically-oriented questions relating to obsessions, excessive cleanliness, and

overdependence on the TRF-A were not captured on the generalized anxiety or physical symptoms MASC-2 subscales. There is a need for teacher reported anxiety scales that align with self-report and parent report forms in the same assessment suite.

There were also limitations regarding the SCD framework in the current study. Due to school and logistical constraints for students and staff participating in the study, such as time and scheduling, a preset design was established to outline resources needed and ensure study completion. Baseline phases were predetermined to be one, two, or three weeks in duration across the three groups with intervention phases following the designated TGFG session timeline. Future studies should aim to establish more stable baselines via student data in lieu of imposed timelines before moving to intervention phases. While this is often difficult when implementing interventions in schools across groups of individuals in applied studies, allowing more time for students to establish more stable baselines would be beneficial for visual analysis and interpretation. In the current study, data remained variable across the majority of phases for participants, so establishing stability within phases would likely have been difficult.

The current study presented an exploratory and preliminary approach to determining if student anxiety differed by intervention phase corresponding to CBT components. In this study, all students received the CBT components in the same phasic sequence within their groups. This design allowed a glimpse into how these components may impact anxiety, but no clear patterns or conclusive findings were found regarding specific components. Additional research should examine the impact of particular components of CBT on student anxiety to better determine those that may be more effective to help streamline intervention efforts and help inform who can deliver

intervention in these areas.

The Think Good Feel Good intervention study demonstrated anxiety improvement for all students on self-reported pre/post MASC-2 assessment and some improvement on parent and teacher reported pre/post assessments. More limited anxiety improvement was reported on progress monitoring measures, SUDS and DBR-A. This is one study with a small and fairly homogenous sample. While the current study presents some initial findings for the implementation of the TGFG intervention as a 6-week modularized program with students in elementary school, additional studies are needed to ascertain the effectiveness of TGFG as a standalone intervention program. Future research should examine TGFG effectiveness with differing intervention dosage, assessment tools, content selection, and varying student samples. Additionally, a new second-edition TGFG workbook was recently published that warrants future review and research.

Implications for Practice

The current study has implications for anxiety treatment and intervention in practice. Formative assessments and progress monitoring measures used to capture internalizing problems, such as anxiety, is an area needing continued research. This is particularly salient given the differing responses to intervention based on assessment measures; all participants showed improvement on the MASC-2 SR assessment in at least one anxiety area, yet the progress monitoring data did not consistently reflect student response to intervention. It is important during social-emotional or mental health interventions, just like academic or behavioral interventions, to assess how a student is responding to intervention in an ongoing and intentional process. Evaluating SUDS rating

forms for anxiety or exploring other ways of measuring anxiety for a similar purpose is imperative in helping practitioners and researchers determine what is working and what is not working for students.

The TGFG intervention implemented in the current study selected intervention content from specific CBT component areas in the workbook based on student need and age. Since the program was intended to be used flexibly, it lent itself well to a modularized approach to intervention. Pre/post assessment data suggested preliminary evidence that TGFG materials can help reduce student anxiety when implemented as a brief, school-based intervention. Therefore, it shows promise as an inexpensive tool to help address student anxiety issues and reduce anxiety through a relatively short intervention duration. In addition, the workbook materials are accompanied by a manual to provide background information and implementation guidelines with the intent to be utilized by many professionals and service providers. Although not investigated as part of this study, the TGFG materials could potentially be implemented by a variety of interventionists within a school setting. Results from the social validity data suggested perceived acceptability and utility among the student participants, indicating buy-in for potential use of these materials with other youth samples struggling with anxiety issues in schools.

Conclusion

In a brief, CBT-based modularized intervention study for student anxiety conducted in an elementary school, preliminary findings were mixed. Self-report pre/post data on the MASC-2 indicated significant reductions in anxiety for all students and for the majority of students on parent report. Visual analyses of the formative assessments

indicated that the majority of students reduced their anxiety from mean baseline to mean intervention on SUDS and demonstrated anxiety improvement on DBR-A; however, results for the overall sample using the *d* statistic for single case design indicated a small effect size estimate ($G = 0.12$). Future research should further examine the effectiveness and utility of the Think Good Feel Good program in schools, the effectiveness of specific CBT components in student anxiety intervention programming, and investigate formative assessment tools to monitor student internalizing symptoms.

Table 1

Participant Demographics (N = 14)

Group	Participant	Sex	Age	Race	Ethnicity
5 th grade	5A	F	11	White	Non-Hispanic
	5B	M	11	White	Non-Hispanic
	5C	F	11	White	Non-Hispanic
	5D	M	11	White	Non-Hispanic
	5E*	F	10	White	Non-Hispanic
	5F*	M	10	White	Non-Hispanic
4 th grade	4A	M	10	White	Non-Hispanic
	4B	M	9	White	Non-Hispanic
	4C	M	10	Multiple	Non-Hispanic
	4D*	M	10	Black or African American	Non-Hispanic
3 rd grade	3A	M	8	White	Non-Hispanic
	3B	M	9	White	Non-Hispanic
	3C	F	8	White	Non-Hispanic
	3D	M	9	White	Non-Hispanic
Overall Sample		71% Male		86% White	100% Non-Hispanic

*Note: * indicates participant was not included in the analytic sample*

Table 2

Think Good Feel Good (TGFG) Intervention Session Plan and Lesson Components

Session	CBT Component	Lesson Objective	Teaching Materials	Worksheet/Activity
1	Introduction/ Psychoeducation	Provide group purpose/goals and teach group rules	[General info + group rules]	--
2	Psychoeducation	Understand what anxiety is and how it feels in the body	Beating Anxiety; What is CBT?	When I Feel Worried
3	Psychoeducation	Learn about the connections between thoughts, feelings, and behavior via the cognitive triad	Thoughts, Feelings, and What You Do (The Magic Circle, What You Think, What You Feel, What You Do)	The Magic Circle; What I Think, What I Do, or How I Feel
4	Psychoeducation	Understand specific connections between components of the triad and how it fits together	How You Feel; (What Feelings Do I Have – Stress, Feelings and What You Do, Feelings and What You Think, Putting It All Together)	Thoughts and Feelings; What Happens When I Feel Anxious?
5	Somatic Management	Identify and understand strong emotions and how to begin controlling them through thoughts and behavior	Controlling Your Feelings	The Feeling Thermometer; The Feeling Strong Room
6	Somatic Management	Learn about relaxation techniques and practice physical relaxation	Learn to Relax (Physical Relaxation, Physical Exercise); Absorbing Activities	Learning to Relax
7	Somatic Management	Learn about relaxation techniques and practice controlled breathing and	Controlled Breathing; Calming Pictures; Relaxing Activities	My Relaxing Place

		visualization activities		
8	Somatic Management	Review and practice relaxation techniques	[Review relaxation strategies]	My Relaxing Activities
9	Cognitive Restructuring	Understand what automatic thoughts and thinking errors are and how they connect with feelings and behavior	Automatic Thoughts; Thinking Errors	Worrying thoughts about what I do; Thought thermometer
10	Cognitive Restructuring	Learn about cognitive strategies and practice positive self-talk	Controlling Your Thoughts; Positive Self-talk	Positive Self-talk
11	Cognitive Restructuring	Learn about cognitive strategies and practice coping self-talk	Coping Self-talk	Coping Self-talk
12	Cognitive Restructuring	Review and practice cognitive strategies	[Review thought strategies]	Looking for the Positive

Table 3

Pre and Post MASC-2 and TRF-A Data by Self, Parent, and Teacher Report (N=11)

Group	Participant	Self-Report		Parent		Teacher
		MASC-2 GAD	MASC-2 PS	MASC-2 GAD	MASC-2 PS	TRF-A
5 th grade	5A					
	Pre	74	70	90	90	13
	Post	68	65	53	67	13
	5B					
	Pre	72	62	75	59	9
	Post	62	64	69	59	10
	5C					
	Pre	74	66	61	60	7
	Post	55	53	40	41	12
	5D					
Pre	57	59	44	60	10	
Post	57	58	46	67	5	
4 th grade	4A					
	Pre	74	81	75	55	19
	Post	43	48	60	57	9
	4B					
	Pre	62	62	73	57	14
	Post	57	61	69	52	15
	4C					
	Pre	76	75	60	57	20
Post	70	66	48	55	22	
3 rd grade	3A					
	Pre	68	68	63	57	14
	Post	59	64	67	62	21
	3B					
	Pre	59	54	56	55	9
	Post	60	47	60	62	7
	3C					
	Pre	61	61	65	57	21
	Post	61	60	73	52	21
	3D					
	Pre	60	54	-	-	22
	Post	47	44	-	-	21

Table 4

SUDS Mean Scores by Intervention Phase (N = 11)

Group	Participant	Phase A	Phase B	Phase C	Phase D	Phases BCD
5 th grade	5A*	3.00	2.60	3.20	2.17	2.62
	5B*	5.20	5.38	4.38	3.00	4.43
	5C	1.20	2.11	2.71	1.40	2.14
	5D*	0.40	0.00	0.00	0.00	0.00
	Group Mean	2.45	2.48	2.27	1.09	2.03
4 th grade	4A*	2.10	4.50	0.50	0.55	1.48
	4B*	2.70	0.43	1.33	2.30	1.46
	4C*	5.31	2.40	3.86	1.00	2.69
	Group Mean	3.27	2.36	1.85	1.30	1.76
3 rd grade	3A*	5.73	4.83	4.60	6.00	5.30
	3B	1.00	1.17	1.00	1.33	1.20
	3C	2.21	2.50	1.75	5.00	3.43
	3D	0.00	0.00	0.00	0.36	0.17
	Group Mean	2.08	2.14	1.56	3.19	2.44

*Denotes a responder using mean difference from Phase A to BCD

Table 5

Tau_{novlap} Effect Size Estimates for SUDS by Intervention Phase (N = 11)

	<i>A-B contrast</i>			<i>B-C contrast</i>			<i>C-D contrast</i>			<i>A-BCD contrast</i>		
	<i>Tau_{novlap}</i>	<i>Percentile rank</i>	<i>p</i>									
5A	- 0.20	10 th -25 th	0.540	0.00	10 th	1.000	-0.07	10 th -25 th	0.855	-0.18	10 th -25 th	0.537
5B	0.15	10 th -25 th	0.661	-0.14	10 th -25 th	0.637	†0.18	10 th -25 th	0.608	-0.05	10 th -25 th	0.871
5C	0.29	10 th -25 th	0.386	0.11	10 th -25 th	0.711	-0.31	10 th -25 th	0.372	0.26	10 th -25 th	0.380
5D	-0.20	10 th -25 th	0.549	0.00	10 th	1.000	0.00	10 th	1.000	-0.20	10 th -25 th	0.482
5 th grade group	0.01	10 th -25 th	0.963	-0.01	10 th -25 th	0.959	-0.05	10 th -25 th	0.782	-0.04	10 th -25 th	0.762
4A	0.38	25 th -50 th	0.212	-0.67	50 th -75 th	*0.039	0.05	10 th -25 th	0.859	-0.19	10 th -25 th	0.395
4B	-0.64	50 th -75 th	*0.028	0.24	10 th -25 th	0.427	0.11	10 th -25 th	0.683	-0.39	25 th -50 th	0.075
4C	-0.63	50 th	0.067	0.23	10 th -25 th	0.516	-0.50	25 th -50 th	0.186	-0.54	25 th -50 th	*0.035
4 th grade group	-0.29	10 th -25 th	0.111	-0.07	10 th -25 th	0.721	-0.07	10 th -25 th	0.681	-0.36	25 th -50 th	*0.007
3A	-0.52	25 th -50 th	0.088	-0.17	10 th -25 th	0.648	0.69	50 th -75 th	*0.039	-0.25	10 th -25 th	0.248
3B	0.13	10 th -25 th	0.661	-0.07	10 th -25 th	0.855	0.09	10 th -25 th	0.790	0.10	10 th -25 th	0.632
3C	0.32	10 th -25 th	0.339	-0.38	25 th -50 th	0.308	0.41	25 th -50 th	0.137	0.28	10 th -25 th	0.163
3D	0.00	10 th	1.000	0.00	10 th	1.000	0.36	25 th -50 th	0.228	0.17	10 th -25 th	0.404
3 rd grade group	-0.02	10 th -25 th	0.876	-0.15	10 th -25 th	0.408	0.39	25 th -50 th	*0.013	0.08	10 th -25 th	0.439

* denotes statistically significant difference in anxiety ratings; † denotes Tau-U calculation to correct for baseline trend; Percentile rank information obtained from Parker, Vannest, & Davis, 2011.

Table 6

DBR-A Mean Scores by Intervention Phase (N =11)

Participant	Anxiety Behavior	Phase A	Phase B	Phase C	Phase D	Phases BCD
5A*	SW	0.80	0.90	1.80	1.2	1.2
5B*	AD	1.25	1.00	1.14	2.71	1.59
5C	AD	2.40	1.56	1.86	1.20	1.57
5D*	AD	4.25	1.78	1.38	0.65	1.24
4A*	AD	2.67	2.75	1.00	0.44	1.09
4B*	AD	4.00	2.00	1.20	3.00	2.04
4C*	AD	8.88	5.00	3.36	2.50	3.73
3A*	AD	2.91	1.50	1.25	4.10	2.50
3B	SW	1.31	1.00	2.88	0.50	1.43
3C	AB	4.18	2.33	3.50	1.55	2.46
3D	AB	3.83	3.25	3.20	2.18	2.83

*Denotes a responder using pre/post MASC-2 self-report scores and the SUDS mean difference from Phase A to BCD; Anxiety behavior on the DBR-A: SW = social withdrawal, AB = avoidant behavior, AD = anxious distress

Table 7

Social Validity Self-Report Ratings (N =11)

Group	Participant	Question 1	Question 2	Question 3	Question 4
5 th grade	5A	3	3	4	4
	5B	4	4	3	4
	5C	3	2	3	2
	5D	4	4	4	4
	Group Mean	3.5	3.25	3.5	3.5
4 th grade	4A	4	4	4	4
	4B	4	4	3	4
	4C	4	4	3	3
	Group Mean	4	4	3.33	3.67
3 rd grade	3A	4	3	3	4
	3B	4	3	4	3
	3C	4	4	4	4
	3D	4	3	4	3
	Group Mean	4	3.25	3.75	3.5
Overall Mean		3.82	3.45	3.55	3.55

Ratings – 1 = I really disagree; 2 = I kind of disagree; 3 = I kind of agree; 4 = I really agree
Question 1: I liked this group. Question 2: This group helped me. Question 3: I will keep using the things I learned in group. Question 4: I would suggest this group to friends.

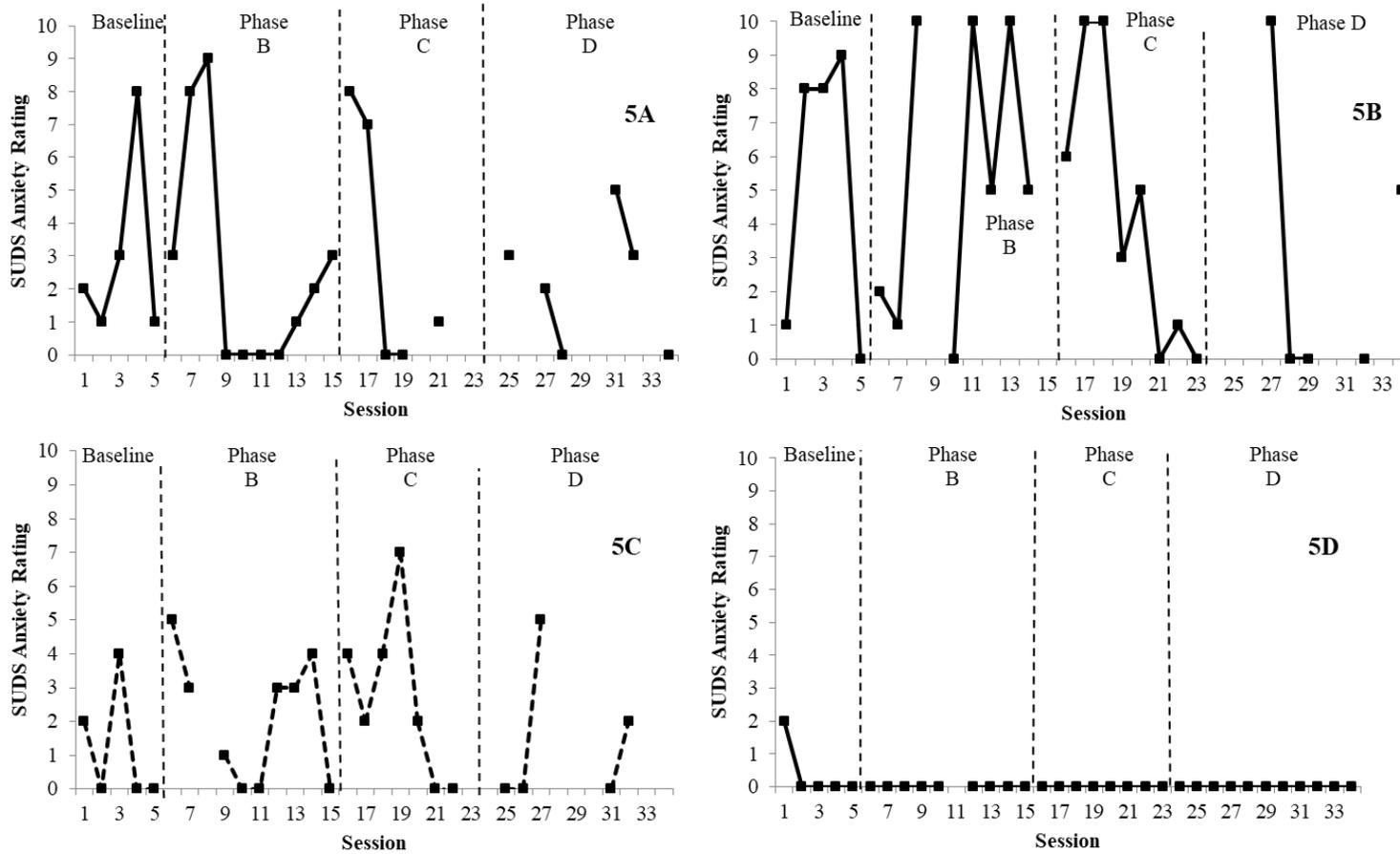


Figure 1. Fifth Grade Individual SUDS Data

Note: solid lines represent anxiety reduction via mean level change from baseline to combined intervention phases, dashed lines represent no anxiety reduction via mean level change

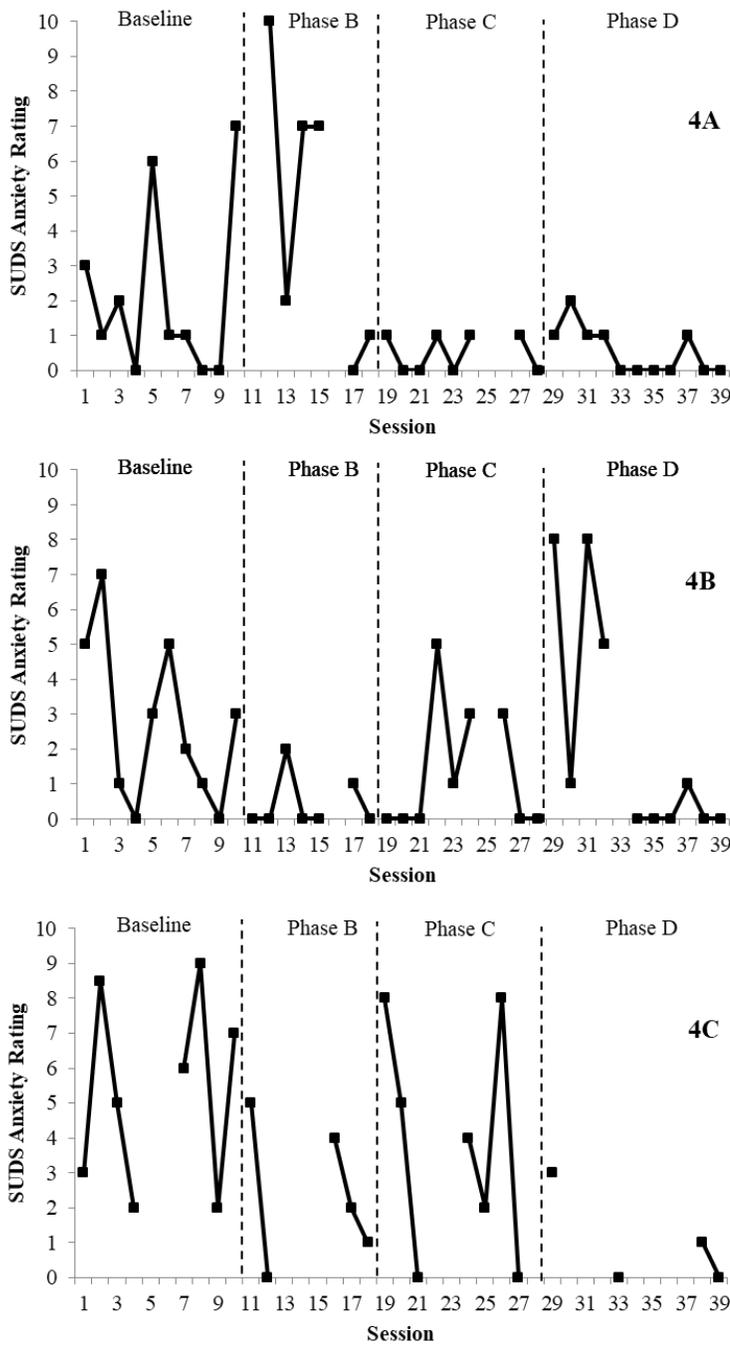


Figure 2. Fourth Grade Individual SUDS Data

Note: solid lines represent anxiety reduction via mean level change from baseline to combined intervention phases, dashed lines represent no anxiety reduction via mean level change

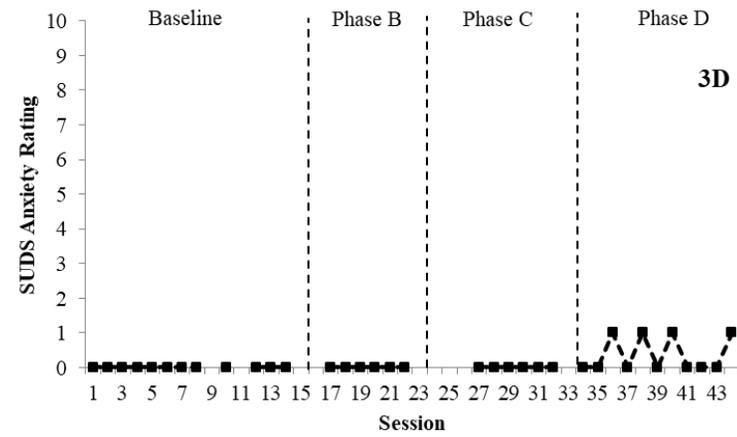
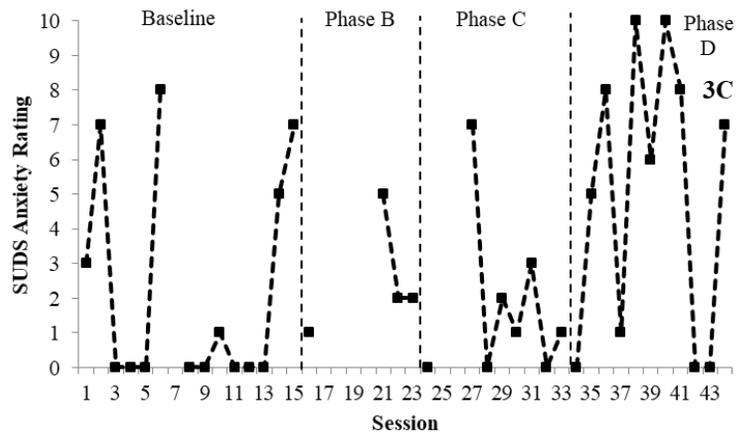
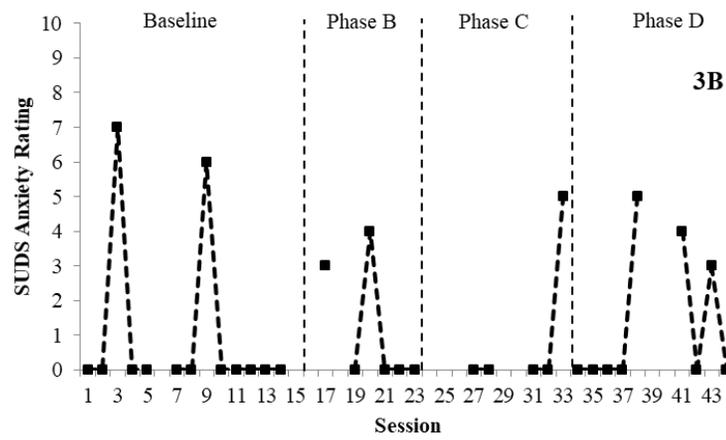
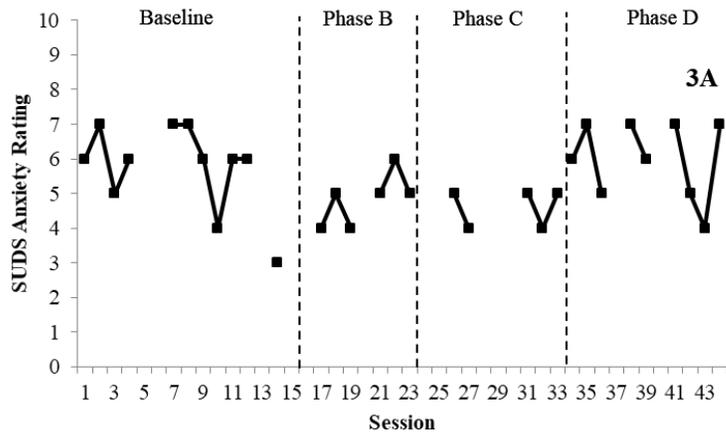


Figure 3. Third Grade Individual SUDS Data

Note: solid lines represent anxiety reduction via mean level change from baseline to combined intervention phases, dashed lines represent no anxiety reduction via mean level change

CHAPTER 4**Synthesis and General Discussion**

The current project addressed several gaps in the landscape of school-based anxiety interventions. While previous research had demonstrated positive findings of empirical studies and systematic reviews (e.g., Neil & Christensen, 2009), gaps in knowledge regarding specific components and structures of effective interventions remained. In particular, this project responded to research needs in areas such as intervention intensity and dosage, CBT program components, the use of formative assessment, and effectiveness of a modularized intervention program. The overall purpose of this project was to synthesize existing research literature on school-based anxiety interventions and use these findings to help design and implement an efficient and feasible anxiety intervention with students in an elementary school. These project goals were developed in response to research needs and to the high prevalence of anxiety disorders and subclinical anxiety symptoms that students experience which negatively affect student functioning and wellbeing (e.g. Merikangas et al, 2010; Weis, 2014; Donovan & Spence, 2000). Key takeaways from each project study are outlined below and implications for practice and future research directions are further discussed.

Study 1 Key Findings

Findings from Study 1 updated and expanded the research literature to better understand the landscape and the state of the science for anxiety interventions in school settings. Results from Study 1 indicated that just under half of the reviewed trials reported statistically significant reductions in student anxiety, noting fewer trials than found in Neil and Christensen's (2009) review. Consideration of low to medium study quality found across most reviewed studies was noted, along with the high prevalence of trials with primary prevention focuses. Findings also demonstrated that CBT continued to

be a large theoretical base and an effective treatment in anxiety interventions, and most programs included CBT components of psychoeducation, somatic management, and cognitive restructuring. Potential lines of research could investigate if particular components of CBT in school-based interventions are more impactful or beneficial than others on student anxiety and further tease apart what makes CBT effective. Trials with significant and moderate effect sizes implemented interventions with ranges of six to ten sessions and 45 to 90 minutes per session, indicating fairly lengthy intervention sessions for implementation in schools. In addition, the majority of reviewed intervention programs were clearly manualized, providing opportunities for research investigating the application of other treatment approaches, such as common elements, that may be more flexible and practical in school-based settings. In sum, the findings from Study 1 pointed to concerns regarding the feasibility of intervention implementation in schools. In particular, a high number of manualized programs were used; these programs are often resource-intensive including material cost, training, limitations regarding interventionist, and contain standardized program content. In addition, logistical and scheduling restraints for intervention time during the school day, especially for longer session durations, can be problematic for intervention design and delivery.

Study 2 Key Findings

Study 2 responded to many of the outlined research needs and feasibility concerns articulated in Study 1. Specifically, Study 2 sought to evaluate the effectiveness of a low-cost, brief, modularized intervention program based in CBT, Think Good Feel Good, on anxiety for students in elementary school. Results from pre/post self-report data indicated statistically significant reductions in anxiety across all students with the majority of

students reducing anxiety based on parent report and fewer based on teacher report. The TGFG program had limited research with only computerized adaptations of the program documented in the literature, but found preliminary findings of anxiety reduction (Stallard, Richardson, Velleman, & Attwood, 2011; Attwood, Meadows, Stallard, & Richardson, 2012). While past reviewed research mainly focused on pre/post assessments in a group design framework and lacked social validity data, Study 2 incorporated the use of formative assessment and social validity assessment in a multiple baseline SCD. Results from the formative assessment measures were mixed, but the study took an exploratory view in examining anxiety measures throughout the intervention period and in analyzing CBT components for phasic differences. There is a need for continued research to develop and refine formative assessments for internalizing symptoms. Social validity data was also collected and indicated TGFG had high acceptability and perceived utility by student report. Study 2 provided initial insight into the effectiveness of the TGFG program implemented as a modularized intervention with students in elementary school. Additional research should be conducted to ascertain TGFG effectiveness using the original materials and should also examine the updated workbook edition.

Recommendations for Addressing Youth Anxiety in Schools

Key takeaways from the two studies in this project provide additional directions for research and practice and have implications for reducing student anxiety in schools. Schools serve as critical settings for the delivery of mental health services (Taras, 2004) and are ideal service settings in many respects: they may help ease stigma, reduce the burden of outside treatment such as costs and transportation, and help support the monitoring of student progress and functioning within the school day (Gosch, et al,

2012). Due to potential serious and long-term effects of untreated anxiety (e.g., Rapee et al, 2005; Essau et al, 2014), it is essential that schools play a role in helping to identify anxiety early and implement prevention and intervention efforts to help address anxiety, the most common set of disorders and psychological problems for youth. There are, however, unique challenges and issues for intervention implementation in schools. This project highlights how anxiety supports can be successfully implemented in an applied school setting and how findings can inform future research.

Implications for Practice

Findings from this project continue to reiterate the need for mental health promotion/prevention and early identification for intervention in schools to help improve overall outcomes for students. Students suffering from anxiety may demonstrate concerns across cognitive, social, behavioral, and physiological domains (Donovan & Spence, 2000) impacting learning and performance necessary for academic success and overall health and wellbeing. It is imperative that educators and school staff undergo the appropriate training and acquire knowledge of mental health issues to help identify concerns or symptoms and help support students in need. Students exhibiting internalizing concerns may not be as easily identified as students with disruptive behaviors or externalizing concerns (Gosch et al., 2012); however, schools have the opportunity to learn about more observable signs of internalizing problems, build trusting relationships, and work to minimize the number of students who are ‘silent sufferers’ at school. In Study 2, teachers were able to use a structured nomination process to help identify students via observable anxiety symptoms, and these student concerns were verified through an anxiety assessment. While Study 2 may have identified some students

with more severe needs than intended based on the data, the structured nomination process showed initial utility as a tool for teachers in the selection of students for school-based interventions. Additionally, as many articles reviewed in Study 1 indicated, there are opportunities for teachers and other school professionals to help provide mental health promotion and prevention supports, whether through the modeling of specific evidence-based techniques, the delivery of basic psychoeducational material, or through the delivery of class-wide intervention programs. Mental health education needs expanded in schools to support identification and intervention efforts. School psychologists and mental health professionals can help schools support these efforts and provide professional development, research, and training to meet student and school need.

There are also challenges of implementing anxiety interventions and supports in schools, many of which were encountered in the design and implementation of the TGFG intervention in Study 2, including high student need with limited support staff, student attendance issues, missing data, and scheduling difficulties. Although there is research evidence demonstrating school-based anxiety program effectiveness, researchers and practitioners need to problem solve and work diligently to focus on the research to practice gap through the identification of barriers and needs to create sustainable mental health efforts (Owens, et al. 2013). This may mean breaking down logistical or resource barriers, such as time and scheduling, personnel for implementation, costs for training and materials, and finding quiet and private physical spaces for more intensive supports. It may also mean developing mental health awareness across the school and cultivating a welcoming and safe school environment to support mental health initiatives. Fostering

buy-in from administration and teachers as well as addressing attitudinal concerns and promoting self-efficacy in these processes are essential (Han & Weiss, 2005).

Future Research Directions

Based on presented research in this project, CBT is a common theoretical basis for many anxiety interventions, and CBT-based interventions have demonstrated effectiveness for students in school settings, but questions remain. In particular, there is a need to better understand the specific components that underlie CBT. Study 2 took an exploratory approach examining the potential effectiveness of particular CBT components on student anxiety, but found limited evidence to support phasic differences. Additional research should evaluate which CBT components may be most beneficial or effective, for whom, and in what mode or intensity of delivery. A better understanding of how specific components contribute to or affect student growth or progress throughout an intervention program is also warranted. Conducting research using component analyses can help tease apart effective components and results could help inform how to better streamline treatments if particular components work well in isolation or in pairs or groups. Research could also address which particular sequences of component delivery may be most effective.

Additionally, there is an overall need for continued development and refinement of current progress monitoring and formative assessment measures for internalizing symptoms. Formative assessments are critical in helping evaluate treatment progress and student growth during intervention. Study 2 undertook the use of formative assessment through student-reported SUDS and teacher-reported DBR-A measures. These measures represented an important first step in assessing student anxiety. Limited research on

formative assessment for anxiety demonstrates the need for self-report assessments that are more sophisticated, sensitive to change, and developmentally appropriate by age. Assessments should cover varying types and presentations of symptoms, including at clinical and subclinical levels, and should be used to inform treatment modification as necessary. The SUDS self-report measure used in Study 2 provided an exploratory way of capturing anxiety in an easy to use and understandable format for elementary-aged students. While this measure provided a snapshot of the level of student anxiety when assessed each day, this assessment tool did not specify or track specific anxiety symptoms to inform detailed changes to individualized treatments. Future research should develop tools to expand to fit the many varied needs of students and purposes for intervention. Psychometric data for tools in development is also necessary to determine reliability and validity of their use with students in schools during the provision of intervention services and supports. Formative assessments based on self-report provide valuable insight and introspection for internalizing symptoms and can be administered to help support the use of programs using the common elements treatment approach.

While Study 1 highlighted the prevalence and use of manualized intervention programs for anxiety, Study 2 sought to explore the application of an intervention program using a modularized or common elements approach to treatment. Using this flexible approach to intervention allowed content to be tailored to student need and developmental level as well as align with evidence-based CBT. The modularized approach also provided a framework for the use of formative assessment measures in a single case design and allowed for a closer analysis of particular CBT components. While intervention effectiveness commonly evaluates manualized programs, there is a need for

more research regarding effectiveness of interventions aligned with the common elements approach. Research should continue to examine the feasibility of this approach in school settings, its interplay with varying formative assessment measures for anxiety, and how it can best meet student needs. This approach offers potential benefits for use in schools, particularly in schools that have resource limitations, and favorable research findings could help streamline intervention efforts and allow for more efficient and targeted interventions.

Conclusion

Anxiety is a prevalent concern among youth, and many do not get the supports and services they need. Left untreated, anxiety can have negative impacts on student functioning and detrimental long-term outcomes. Schools serve as critical settings for the delivery of needed services that many students have difficulty accessing outside of school. This project drew from and expanded upon existing literature in Study 1 and utilized an applied intervention focus to implement a school-based program for anxiety in Study 2. Overall results indicated that CBT is a commonly used theoretical base for school-based anxiety interventions with demonstrated effectiveness at small to moderate magnitudes. Research should continue to investigate varying treatment approaches, assessment tools, and program content and delivery to ensure students receive needed prevention and intervention anxiety supports with efficiency and effectiveness. School-based mental health efforts should continue to explore the research and implement evidence-based practices to best help students with anxiety concerns.

References

References marked with an asterisk indicate studies included in the systematic review.

Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA school-age forms & profiles*. Burlington: Research Centre for Children, Youth and Families, University of Vermont.

Ahlen, J., Lenhard, F., & Ghaderi, A. (2015). Universal prevention for anxiety and depressive symptoms in children: A meta-analysis of randomized and cluster-randomized trials. *The Journal of Primary Prevention, 36*, 387-403.

Attwood, M., Meadows, S., Stallard, P., & Richardson, T. (2012). Universal and targeted computerised cognitive behavioural therapy (Think, Feel, Do) for emotional health in schools: Results from two exploratory studies. *Child and Adolescent Mental Health, 17*, 173-178.

*Aune, T., & Stiles, T. C. (2009). Universal-based prevention of syndromal and subsyndromal social anxiety: A randomized controlled study. *Journal of Consulting and Clinical Psychology, 77*, 867-879.

*Balle, M., & Tortella-Feliu, M. (2010). Efficacy of a brief school-based program for selective prevention of childhood anxiety. *Anxiety, Stress & Coping: An International Journal, 23*, 71-85.

Barrett, P. M. (1998). Evaluation of cognitive-behavioral group treatments for childhood anxiety disorders. *Journal of Clinical Child Psychology, 27*, 459-468.

*Barrett, P. M., Farrell, L. J., Ollendick, T. H., & Dadds, M. (2006). Long-term outcomes of an Australian universal prevention trial of anxiety and depression symptoms in children and youth: An evaluation of the friends program. *Journal of Clinical*

Child and Adolescent Psychology, 35, 403–411.

- *Barrett, P.M., Lock, S., & Farrell, L. J. (2005). Developmental differences in universal preventive intervention for child anxiety. *Clinical Child Psychology and Psychiatry*, 10, 539–555.
- *Barrett, P., & Turner, C. (2001). Prevention of anxiety symptoms in primary school children: Preliminary results from a universal school-based trial. *British Journal of Clinical Psychology*, 40, 399–410.
- Barrett, P., Webster, H., & Turner, C. (2000). *FRIENDS prevention of anxiety and depression for children: Group leader's manual*. Bowen Hills, Queensland, Australia: Australian Academic Press.
- Barth, R. P., Kolivoski, K. M., Lindsey, M. A., Lee, B. R., & Collins, K. S. (2014). Translating the common elements approach: Social work's experiences in education, practice, and research. *Journal of Clinical Child & Adolescent Psychology*, 43, 301-311.
- Beck, J. S. (2011). *Cognitive behavior therapy: Basics and beyond*. New York, NY: Guilford Press.
- Beesdo, K., Knappe, S., & Pine, D. S. (2009). Anxiety and anxiety disorders in children and adolescents: Developmental issues and implications for DSM-V. *Psychiatric Clinics of North America*, 32, 483-524.
- Bennett, K., Manassis, K., Walter, S. D., Cheung, A., Wilansky-Traynor, P., Diaz-Granados, N., ... & Bodden, D. (2013). Cognitive behavioral therapy age effects in child and adolescent anxiety: an individual patient data metaanalysis. *Depression and Anxiety*, 30, 829-841.

- *Berger, R., Pat-Horenczyk, R., & Gelkopf, M. (2007). School-based intervention for prevention and treatment of elementary-students' terror-related distress in Israel: A quasi-randomized controlled trial. *Journal of Traumatic Stress, 20*, 541–551.
- Bernstein, G. A., Layne, A. E., Egan, E. A., & Tennison, D. M. (2005). School-based interventions for anxious children. *Journal of the American Academy of Child & Adolescent Psychiatry, 44*, 1118-1127.
- Bienvenu, O. J., Siegel, D. J., & Ginsburg, G. S. (2010). Prevention of anxiety disorders. In M. T. Compton (Ed.), *Clinical manual of prevention in mental health* (pp. 83-103). Washington DC: American Psychiatric Publishing, Inc.
- Bittner, A., Goodwin, R. D., Wittchen, H. U., Beesdo, K., Höfler, M., & Lieb, R. (2004). What characteristics of primary anxiety disorders predict subsequent major depressive disorder?. *The Journal of Clinical Psychiatry, 65*, 618-626.
- *Bonhauser, M., Fernandez, G., Püschel, K., Yañez, F., Montero, J., Thompson, B., et al. (2005). Improving physical fitness and emotional well-being in adolescents of low socioeconomic status in Chile: Results of a school-based controlled trial. *Health Promotion International, 20*, 113–122.
- Bordin, I. A., Rocha, M. M., Paula, C. S., Teixeira, M. C. T., Achenbach, T. M., Rescorla, L. A., & Silvaes, E. F. (2013). Child Behavior Checklist (CBCL), Youth Self-Report (YSR) and Teacher's Report Form (TRF): An overview of the development of the original and Brazilian versions. *Cadernos de Saúde Pública, 29*, 13-28.
- Borkovec, T. D., Newman, M. G., Pincus, A. L., & Lytle, R. (2002). A component analysis of cognitive-behavioral therapy for generalized anxiety disorder and the

role of interpersonal problems. *Journal of Consulting and Clinical Psychology*, 70, 288-298.

Borntrager, C., Chorpita, B., Higa-McMillan, C., & Weisz, J. (2009). Provider attitudes toward evidence-based practices: Are the concerns with the evidence or with the manuals? *Psychiatric Services*, 60, 677-681.

*Bouchard, S., Gervais, J., Gagnier, N., & Loranger, C. (2013). Evaluation of a primary prevention program for anxiety disorders using story books with children aged 9-12 years. *The Journal of Primary Prevention*, 34, 345-358.

*Calear, A. L., Batterham, P. J., Poyser, C. T., Mackinnon, A. J., Griffiths, K. M., & Christensen, H. (2016). Cluster randomised controlled trial of the e-couch Anxiety and Worry program in schools. *Journal of Affective Disorders*, 196, 210-217.

*Calear, A. L., Christensen, H., Mackinnon, A., Griffiths, K. M., & O'Kearney, R. (2009). The YouthMood Project: A cluster randomized controlled trial of an online cognitive behavioral program with adolescents. *Journal of Consulting and Clinical Psychology*, 77, 1021-1032.

Card, N. A. (2011). *Applied meta-analysis for social science research*. New York, NY: Guilford Press.

*Castellanos, N., & Conrod, P. (2006). Brief interventions targeting personality risk factors for adolescent substance misuse reduce depression, panic and risk-taking behaviours. *Journal of Mental Health*, 15, 645-658.

Chafouleas, S. M., McDougal, J. L., Riley-Tillman, T. C., Panahon, C. J., & Hilt, A. M. (2005). What do daily behavior report cards (DBRCs) measure? An initial

comparison of DBRCs with direct observation for off-task behavior. *Psychology in the Schools*, 42, 669-676.

Chafouleas, S. M., Riley-Tillman, T. C., & Christ, T. J. (2009). Direct Behavior Rating (DBR): An emerging method for assessing social behavior within a tiered intervention system. *Assessment for Effective Intervention*, 34, 195-200.

Chorpita, B. F., Daleiden, E. L., & Weisz, J. R. (2005). Identifying and selecting the common elements of evidence based interventions: A distillation and matching model. *Mental Health Services Research*, 7, 5–20.

Christ, T. J., Nelson, P. M., Van Norman, E. R., Chafouleas, S. M., & Riley-Tillman, T. C. (2014). Direct Behavior Rating: An evaluation of time-series interpretations as consequential validity. *School Psychology Quarterly*, 29, 157-170.

Christ, T. J., Riley-Tillman, T. C., & Chafouleas, S. M. (2009). Foundation for the development and use of Direct Behavior Rating (DBR) to assess and evaluate student behavior. *Assessment for Effective Intervention*, 34, 201-213.

Clay, R. A. (2010). More than one way to measure. *Monitor on Psychology*, 41, 52.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Compton, S. N., March, J. S., Brent, D., Albano, A. M., Weersing, V. R., & Curry, J. (2004). Cognitive-behavioral psychotherapy for anxiety and depressive disorders in children and adolescents: An evidence-based medicine review. *Journal of the American Academy of Child & Adolescent Psychiatry*, 43, 930-959.

*Cooley-Strickland, M. R., Griffin, R. S., Darney, D., Otte, K., & Ko, J. (2011). Urban African American youth exposed to community violence: A school-based anxiety

preventive intervention efficacy study. *Journal of Prevention & Intervention in the Community*, 39, 149-166.

*Dadds, M. R., Holland, D. E., Laurens, K. R., Mullins, M., Barrett, P.M., & Spence, S. H. (1999). Early intervention and prevention of anxiety disorders in children: Results at 2-year follow-up. *Journal of Consulting and Clinical Psychology*, 67, 145–150.

*Dadds, M. R., Spence, S. H., Holland, D. E., Barrett, P. M., & Laurens, K. R. (1997). Prevention and early intervention for anxiety disorders: A controlled trial. *Journal of Consulting and Clinical Psychology*, 65, 627–635.

Dart, E. H., Arora, P. G., Collins, T. A., & Doll, B. (2018). Progress monitoring measures for internalizing symptoms: A systematic review of the peer-reviewed literature. *School Mental Health*, 1-11.

Dart, E. H., Furlow, C. M., Collins, T. A., Brewer, E., Gresham, F. M., & Chenier, K. H. (2015). Peer-mediated check-in/check-out for students at-risk for internalizing disorders. *School Psychology Quarterly*, 30, 229-243.

Doll, B., & Cummings, J. A. (2008). Best practices in population-based school mental health services. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology V*, (pp. 1333-1347). Bethesda, MD: National Association of School Psychologists.

Donovan, C. L., & Spence, S. H. (2000). Prevention of childhood anxiety disorders. *Clinical Psychology Review*, 20, 509-531.

Erhardt, V. A., & Miller, F. G. (2019). *School-based anxiety interventions: A systematic review of randomized controlled trials*. Unpublished manuscript.

- *Essau, C. A., Conradt, J., Sasagawa, S., & Ollendick, T. H. (2012). Prevention of anxiety symptoms in children: Results from a universal school-based trial. *Behavior Therapy, 43*, 450-464.
- Essau, C. A., Lewinsohn, P. M., Olaya, B., & Seeley, J. R. (2014). Anxiety disorders in adolescents and psychosocial outcomes at age 30. *Journal of Affective Disorders, 163*, 125-132.
- Every Student Succeeds Act, 20 U.S.C. Pub. L. 114-95 (2015).
- Fisak, B. J., Jr., Richard, D., & Mann, A. (2011). The prevention of child and adolescent anxiety: A meta-analytic review. *Prevention Science, 12*, 255-268.
- Fracaro, R. L., Stelnicki, A. M., & Nordstokke, D. W. (2015) Test review: Multidimensional Anxiety Scale for Children. *Canadian Journal of School Psychology, 30*, 70-77.
- *Garaigordobil, M. (2004). Effects of a psychological intervention on factors of emotional development during adolescence. *European Journal of Psychological Assessment, 20*, 66–80.
- Gersten, R., Fuchs, L. S., Compton, D., Coyne, M., Greenwood, C., & Innocenti, M. S. (2005). Quality indicators for group experimental and quasi-experimental research in special education. *Exceptional Children, 71*, 149-164.
- *Gillham, J. E., Reivich, K. J., Freres, D. R., Lascher, M., Litzinger, S., Shatté, A., et al. (2006). School-based prevention of depression and anxiety symptoms in early adolescence: A pilot of a parent intervention component. *School Psychology Quarterly, 21*, 323–348.
- *Ginsburg, G. S., & Drake, K. L. (2002). School-based treatment for anxious African-

American adolescents: A controlled pilot study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 768–775.

Gosch, E. A., Flannery-Schroeder, E., & Brecher, R. J. (2012). Anxiety disorders: School-based cognitive-behavioral interventions. In R. B. Mennuti, R. W. Christner, & A. Freeman's (Eds.), *Cognitive-behavioral interventions in educational settings: A handbook for practice* (pp. 117-160). New York, NY: Routledge.

Gwet, K. L. (2014). *Handbook of inter-rater reliability: The definitive guide to measuring the extent of agreement among raters* (4th ed.). Gaithersburg, MD: Advanced Analytics.

*Hains, A. A. (1992). Comparison of cognitive-behavioral stress management techniques with adolescent boys. *Journal of Counseling & Development*, 70, 600–605.

*Hains, A. A., & Ellmann, S. W. (1994). Stress inoculation training as a preventative intervention for high school youths. *Journal of Cognitive Psychotherapy*, 8, 219–232.

*Hains, A. A., & Szyjakowski, M. (1990). A cognitive stress-reduction intervention program for adolescents. *Journal of Counseling Psychology*, 37, 79–84.

Han, S. S., & Weiss, B. (2005). Sustainability of teacher implementation of school-based mental health programs. *Journal of Abnormal Child Psychology*, 33, 665-679.

Harrison, S. E., Riley-Tillman, T. C., & Chafouleas, S. M. (2014). Direct Behavior Rating: Considerations for rater accuracy. *Canadian Journal of School Psychology*, 29, 3-20.

*Hiebert, B., Kirby, B., & Jaknavorian, A. (1989). School-based relaxation: Attempting

primary prevention. *Canadian Journal of Counselling*, 23, 273–287.

Huberty, T. J. (2008). Best practices in school-based interventions for anxiety and depression. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology V*, (pp. 1473-1486). Bethesda, MD: National Association of School Psychologists.

Huberty, T. J. (2014). Best practices in school-based interventions for anxiety and depression. In P. L. Harrison & A. Thomas (Eds.), *Best practices in school psychology: Student-level services* (6th ed.), (pp. 349-364). Bethesda, MD: National Association of School Psychologists.

Jacobson, N. S., Dobson, K. S., Truax, P. A., Addis, M. E., Koerner, K., Gollan, J. K., ...Prince, S. E. (1996). A component analysis of cognitive-behavioral treatment for depression. *Journal of Consulting and Clinical Psychology*, 64, 295-304.

Jitendra, A. K., Burgess, C., & Gajria, M. (2011). Cognitive strategy instruction for improving expository text comprehension of students with learning disabilities: The quality of evidence. *Exceptional Children*, 77, 135-159.

*Johnson, C., Burke, C., Brinkman, S., & Wade, T. (2016). Effectiveness of a school-based mindfulness program for transdiagnostic prevention in young adolescents. *Behaviour Research and Therapy*, 81, 1-11.

Kendall, P. C., & Hedtke, K. (2006). *Cognitive-behavioral therapy for anxious children: Therapist manual* (3rd ed.). Ardmore, PA: Workbook.

Kendall, P. C., Puliafico, A. C., Barmish, A. J., Choudhury, M. S., Henin, A., & Treadwell, K. S. (2007). Assessing anxiety with the Child Behavior Checklist and the Teacher Report Form. *Journal of Anxiety Disorders*, 21, 1004-1015.

*Keogh, E., Bond, F. W., & Flaxman, P. E. (2006). Improving academic performance

and mental health through a stress management intervention: Outcomes and mediators of change. *Behaviour Research and Therapy*, *44*, 339–357.

*Kiselica, M. S., Baker, S. B., Thomas, R. N., & Reedy, S. (1994). Effects of stress inoculation training on anxiety, stress, and academic performance among adolescents. *Journal of Counseling Psychology*, *41*, 335–342.

Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2010). Single-case designs technical documentation. Retrieved from What Works Clearinghouse website:
<https://ies.ed.gov/ncee/wwc/Document/229>.

*Lock, S., & Barrett, P. M. (2003). A longitudinal study of developmental differences in universal preventive intervention for child anxiety. *Behaviour Change*, *20*, 183–199.

*Lowry-Webster, H. M., Barrett, P. M., & Dadds, M. R. (2001). A universal prevention trial of anxiety and depressive symptomatology in childhood: Preliminary data from an Australian study. *Behaviour Change*, *18*, 36–50.

*Lowry-Webster, H. M., Barrett, P. M., & Lock, S. (2003). A universal prevention trial of anxiety symptomatology during childhood: Results at 1-year follow-up. *Behaviour Change*, *20*, 25–43.

Lyon, A. R., Borntrager, C., Nakamura, B., & Higa-McMillan, C. (2013). From distal to proximal: Routine educational data monitoring in school-based mental health. *Advances in School Mental Health Promotion*, *6*, 263–279.

Lyon, A. R., Bruns, E. J., Weathers, E. S., Canavas, N., Ludwig, K., Vander Stoep, A., ... McCauley, E. (2014). Taking evidence-based practices to school: Using expert

opinion to develop a brief, evidence-informed school-based mental health intervention. *Advances in School Mental Health Promotion*, 7, 42-61.

Maddox, L., Jolley, S., Laurens, K. R., Hirsch, C., Hodgins, S., Browning, S., ...Kuipers, E. (2013). Cognitive behavioural therapy for unusual experiences in children: A case series. *Behavioural and Cognitive Psychotherapy*, 41, 344-358.

*Malgady, R. G., Rogler, L. H., & Costantino, G. (1990). Hero/heroine modelling for Puerto Rican adolescents: A preventive mental health intervention. *Journal of Consulting and Clinical Psychology*, 58, 469-474.

*Manassis, K., Wilansky-Traynor, P., Farzan, N., Kleiman, V., Parker, K., & Sanford, M. (2010). The feelings club: Randomized controlled evaluation of school-based CBT for anxious or depressive symptoms. *Depression and Anxiety*, 27, 945-952.

March, J. S. (1997). *Manual for the Multidimensional Anxiety Scale for Children*. Toronto: Multi-Health Systems.

March, J. S. (2013). *Multidimensional Anxiety Scale for Children – 2nd edition: Technical manual*. Toronto: Multi-Health Systems.

*Masia-Warner, C., Klein, R. G., Dent, H. C., Fisher, P. H., Alvir, J., Albano, A. M., et al. (2005). School-based intervention for adolescents with social anxiety disorder: Results of a controlled study. *Journal of Abnormal Child Psychology*, 33, 707-722.

Merikangas, K. R., He, J. P., Burstein, M., Swanson, S. A., Avenevoli, S., Cui, L., ... Swendsen, J. (2010). Lifetime prevalence of mental disorders in US adolescents: Results from the National Comorbidity Survey Replication-Adolescent Supplement (NCS-A). *Journal of the American Academy of Child & Adolescent*

Psychiatry, 49, 980-989.

Merikangas, K. R., He, J. P., Burstein, M., Swendsen, J., Avenevoli, S., Case, B., ...

Olfson, M. (2011). Service utilization for lifetime mental disorders in US adolescents: Results of the National Comorbidity Survey–Adolescent Supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry*, 50, 32-45.

Merrell, K. W. (1994). *Assessment of behavioral, social, and emotional problems: Direct and objective methods for use with children and adolescents*. New York: Longman.

Miller, F. G. (2017). Direct Behavior Ratings – Anxiety. [Unpublished assessment].

*Miller, L. D., Laye-Gindhu, A., Bennett, J. L., Liu, Y., Gold, S., March, J. S., ...

Waechtler, V. E. (2011). An effectiveness study of a culturally enriched school-based CBT anxiety prevention program. *Journal of Clinical Child and Adolescent Psychology*, 40, 618-629.

*Miller, L. D., Laye-Gindhu, A., Liu, Y., March, J. S., Thordarson, D. S., & Garland, E. J. (2011). Evaluation of a preventive intervention for child anxiety in two randomized attention-control school trials. *Behaviour Research and Therapy*, 49, 315-323.

*Miller, L. D., Short, C., Garland, E. J., & Clark, S. (2010). The ABCs of CBT (cognitive behavior therapy): Evidence-based approaches to child anxiety in public school settings. *Journal of Counseling & Development*, 88, 432-439.

*Misfud, C., & Rapee, R. M. (2005). Early intervention for childhood anxiety in a school setting: Outcomes for an economically disadvantaged population. *Journal of the*

American Academy of Child and Adolescent Psychiatry, 44, 996–1004.

Mychailyszyn, M. P., Brodman, D. M., Read, K. L., & Kendall, P. C. (2012). Cognitive-behavioral school-based interventions for anxious and depressed youth: A meta-analysis of outcomes. *Clinical Psychology: Science and Practice*, 19, 129-153.

Neil, A. L., & Christensen, H. (2009). Efficacy and effectiveness of school-based prevention and early intervention programs for anxiety. *Clinical Psychology Review*, 29, 208-215.

Nixon, R. D. V., Sterk, J., & Pearce, A. (2011). A randomized trial of cognitive behaviour therapy and cognitive therapy for children with posttraumatic stress disorder following single-incident trauma. *Journal of Abnormal Child Psychology*, 40, 327-337.

Orwin, R. G. (1983). A fail-safe N for effect size in meta-analysis. *Journal of Educational Statistics*, 8, 157-159.

Owens, J. S., Lyon, A. R., Brandt, N. E., Warner, C. M., Nadeem, E., Spiel, C., & Wagner, M. (2014). Implementation science in school mental health: Key constructs in a developing research agenda. *School Mental Health*, 6, 99-111.

Parker, R. I., Vannest, K. J., & Davis, J. L. (2011). Effect size in single-case research: A review of nine nonoverlap techniques. *Behavior Modification*, 35, 303-322.

Parker, R. I., Vannest, K. J., Davis, J. L., & Sauber, S. B. (2011). Combining nonoverlap and trend for single-case research: Tau-U. *Behavior Therapy*, 42, 284-299.

*Pattison, C., & Lynd-Stevenson, R. M. (2001). The prevention of depressive symptoms in children: The immediate and long-term outcomes of a school-based program. *Behaviour Change*, 18, 92–102.

- *Pereira, A. I., Marques, T., Russo, V., Barros, L., & Barrett, P. (2014). Effectiveness of the friends for life program in Portuguese schools: Study with a sample of highly anxious children. *Psychology in the Schools, 51*, 647-657.
- Rapee, R. M., Kennedy, S., Ingram, M., Edwards, S., & Sweeney, L. (2005). Prevention and early intervention of anxiety disorders in inhibited preschool children. *Journal of Consulting and Clinical Psychology, 73*, 488-497.
- Rapee, R. M., Wignall, A., Hudson, J. L., & Schniering, C. A. (2000). *Evidence-based treatment of child and adolescent anxiety disorders*. Oakland, CA: New Harbinger.
- Reiss, S. (1987). Theoretical perspectives on the fear of anxiety. *Clinical Psychology Review, 7*, 585-596.
- Reynolds, S., Wilson, C., Austin, J., & Hooper, L. (2012). Effects of psychotherapy for anxiety in children and adolescents: A meta-analytic review. *Clinical Psychology Review, 32*, 251-262.
- Riley-Tillman, T. C., Chafouleas, S. M., Sassu, K. A., Chanese, J. A., & Glazer, A. D. (2008). Examining the agreement of direct behavior ratings and systematic direct observation data for on-task and disruptive behavior. *Journal of Positive Behavior Interventions, 10*, 136-143.
- *Roberts, C. M., Kane, R., Bishop, B., Cross, D., Fenton, J., & Hart, B. (2010). The prevention of anxiety and depression in children from disadvantaged schools. *Behaviour Research and Therapy, 48*, 68-73.
- *Roberts, C., Kane, R., Bishop, B., Matthews, H., & Thomson, H. (2004). The prevention of depression symptoms in rural school children: A follow-up study. *International*

Journal of Mental Health Promotion, 6, 4–16.

- *Roberts, C., Kane, R., Thomson, Bishop, B., & Hart, B. (2003). The prevention of depressive symptoms in rural school children: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 71, 622–628.
- *Rooney, R., Hassan, S., Kane, R., Roberts, C. M., & Nesa, M. (2013). Reducing depression in 9-10 year old children in low SES schools: A longitudinal universal randomized controlled trial. *Behaviour Research and Therapy*, 51, 845-854.
- *Rooney, R., Roberts, C., Kane, R., Pike, L., Winsor, A., White, J., et al. (2006). The prevention of depression in 8- to 9-year-old children: A pilot study. *Australian Journal of Guidance & Counselling*, 16, 76–90.
- Ruttledge, R. A., & Petrides, K. V. (2012). A cognitive behavioural group approach for adolescents with disruptive behaviour in schools. *School Psychology International*, 33, 223-239.
- *Scholten, H., Malmberg, M., Lobel, A., Engels, R. C. M. E., & Granic, I. (2016). A randomized controlled trial to test the effectiveness of an immersive 3D video game for anxiety prevention among adolescents. *PLoS ONE*, 11, 1-24.
- Shadish, W. R., Hedges, L. V., & Pustejovsky, J. E. (2014). Analysis and meta-analysis of single-case designs with a standardized mean difference statistic: A primer and applications. *Journal of School Psychology*, 52, 123-147.
- Shaffer, D., Fisher, P., Dulcan, M. K., Davies, M., Piacentini, J., Schwab-Stone, M. E.,...Regier, D. A. (1996). The NIMH diagnostic interview schedule for children version 2.3 (DISC): Description, acceptability, prevalence rates, and performance in the MECA study. *Journal of the American Academy of Child and Adolescent*

Psychiatry, 35, 865-877.

- *Sheffield, J. K., Spence, S. H., Rapee, R. M., Kowalenko, N., Wignall, A., Davis, A., et al. (2006). Evaluation of universal, indicated, and combined cognitive-behavioral approaches to the prevention of depression among adolescents. *Journal of Consulting and Clinical Psychology*, 74, 66–79.
- *Sportel, B. E., de Hullu, E., de Jong, P. J., & Nauta, M. H. (2013). Cognitive bias modification versus CBT in reducing adolescent social anxiety: A randomized controlled trial. *PLoS ONE*, 8, 1-11.
- Stallard, P. (2002). *Think Good-Feel Good: A cognitive behaviour therapy workbook for children and young people*. John Wiley & Sons.
- Stallard, P. (2005). *A clinician's guide to Think Good-Feel Good: Using CBT with children and young people*. John Wiley & Sons.
- Stallard, P. (2019). *Think Good, Feel Good: A cognitive behavioural therapy workbook for children and young people* (2nd ed.). John Wiley & Sons.
- Stallard, P., Richardson, T., Velleman, S., & Attwood, M. (2011). Computerized CBT (Think, Feel, Do) for depression and anxiety in children and adolescents: Outcomes and feedback from a pilot randomized controlled trial. *Behavioural and Cognitive Psychotherapy*, 39, 273-284.
- *Stallard, P., Skryabina, E., Taylor, G., Phillips, R., Daniels, H., Anderson, R., & Simpson, N. (2014). Classroom-based cognitive behaviour therapy (FRIENDS): A cluster randomised controlled trial to Prevent Anxiety in Children through Education in Schools (PACES). *The Lancet Psychiatry*, 1, 185-192.
- *Stolberg, A. L., & Mahler, J. (1994). Enhancing treatment gains in a school-based

intervention for children of divorce through skill training, parental involvement, and transfer procedures. *Journal of Consulting and Clinical Psychology*, *62*, 147–156.

Taras, H. L. (2004). School-based mental health services. *Pediatrics*, *113*, 1839-1845.

Taylor, S. (1995). Anxiety sensitivity: Theoretical perspectives and recent findings. *Behaviour Research and Therapy*, *33*, 243-258.

Teubert, D., & Pinquart, M. (2011). A meta-analytic review on the prevention of symptoms of anxiety in children and adolescents. *Journal of Anxiety Disorders*, *25*, 1046-1059.

Toland, J., & Boyle, C. (2008). Applying cognitive behavioural methods to retrain children's attributions for success and failure in learning. *School Psychology International*, *29*, 286-302.

Tonks, J., Slater, A., Frampton, I., Wall, S. E., Yates, P., & Williams, W. H. (2008). The development of emotion and empathy skills after childhood brain injury. *Developmental Medicine & Child Neurology*, *51*, 8-16.

U.S. Department of Health and Human Services (1999). *Mental Health: A report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institutes of Health & National Institute of Mental Health.

Valentine, J. C., & Cooper, H. (2008). A systematic and transparent approach for assessing the methodological quality of intervention effectiveness research: The

Study Design and Implementation Assessment Device (Study DIAD).

Psychological Methods, 13, 130-149.

Vannest, K.J., Parker, R.I., Gonen, O., & Adiguzel, T. (2016). Single Case Research:

Web based calculators for SCR analysis. (Version 2.0) [Web-based application].

College Station, TX: Texas A&M University. Available from

singlecaseresearch.org

*Velasquez, A. M., Lopez, M. A., Quinonez, N., & Paba, D. P. (2015). Yoga for the prevention of depression, anxiety, and aggression and the promotion of socio-emotional competencies in school-aged children. *Educational Research and Evaluation*, 21, 407-421.

Velting, O. N., Setzer, N. J., & Albano, A. M. (2004). Update on and advances in assessment and cognitive-behavioral treatment of anxiety disorders in children and adolescents. *Professional Psychology: Research and Practice*, 35, 42-54.

von der Embse, N. P., Scott, E. C., & Kilgus, S. P. (2015). Sensitivity to change and concurrent validity of direct behavior ratings for academic anxiety. *School Psychology Quarterly*, 30, 244-259.

Walker, H. M., Severson, H. H., and Feil, E. G. (2014). *Systematic Screening for Behavior Disorders (SSBD) Administrator's Guide* (2nd ed.). Pacific Northwest Publishing.

Weis, R. (2014). *Introduction to abnormal child and adolescent psychology* (2nd ed.). Thousand Oaks, CA: Sage.

Weisz, J. R., Chorpita, B. F., Palinkas, L. A., Schoenwald, S. K., Miranda, J., Bearman, S. K., ... Research Network on Youth Mental Health (2012). Testing standard and

modular designs for psychotherapy treating depression, anxiety, and conduct problems in youth: A randomized effectiveness trial. *Archives of General Psychiatry*, 69, 274–282.

Werner-Seidler, A., Perry, Y., Calear, A. L., Newby, J. M., & Christensen, H. (2017).

School-based depression and anxiety prevention programs for young people: A systematic review and meta-analysis. *Clinical Psychology Review*, 51, 30-47.

West, A., & Spring, B. (2014). Randomized controlled trials. *Evidenced-Based Behavioral-Practice [EBBP]*.

Wilson, D. B. (n.d.). Practical meta-analysis effect size calculator [Online calculator].

Retrieved November 2016 from <https://www.campbellcollaboration.org/this-is-a-web-based-effect-size-calculator/explore/this-is-a-web-based-effect-size-calculator>

Wilson, G. T. (1998). Manual-based treatment and clinical practice. *Clinical Psychology: Science and Practice*, 5, 363-375.

Wilson, G. T. (2007). Manual-based treatment: Evolution and evaluation. *Psychological Clinical Science: Papers in honor of Richard M. McFall*, 105-132.

Woodward, L. J., & Fergusson, D. M. (2001). Life course outcomes of young people with anxiety disorders in adolescence. *Journal of the American Academy of Child & Adolescent Psychiatry*, 40, 1086-1093.

*Yahav, R., & Cohen, M. (2008). Evaluation of a cognitive-behavioral intervention for adolescents. *International Journal of Stress Management*, 15, 173-188.

Yeo, L. S., & Choi, P. M. (2011). Cognitive-behavioural therapy for children with behavioural difficulties in the Singapore mainstream school setting. *School Psychology International*, 32, 616-631.

Appendix A

Student Nomination Form

This form should be completed to help nominate and select students for intervention inclusion.

Date:

Teacher:

Nomination and Intervention Information

We are looking for students who may benefit from a small group intervention focused on decreasing anxiety and worry. Students with anxiety concerns often have observable physical, cognitive, and behavioral symptoms, which *may* include any of the following:

- **Social Withdrawal:** The student isolates himself/herself from others (peers, teachers, or others). Examples may include “shyness”, reluctance to engage socially with others, limited class participation, and engagement in solitary activities.
- **Avoidant Behavior:** The student takes actions to avoid/escape dealing with a stressor. Examples may include noncompliance, refusal to engage in activities, making up excuses to avoid activities, and not completing activities.
- **Anxious Distress:** The student shows verbal or nonverbal behavior indicative of anxiety. Examples include verbal expressions of worry, nervousness, or fear; restless behavior (e.g. fidgeting); somatic complaints (e.g., headaches, stomach aches), appearing “tense”, appearing tearful or crying, and trembling or shaking.

Are there currently students in your classroom who have self-reported feelings of worry or anxiety OR you have observed anxious symptoms and behaviors in students?

AND

Do you think these students would benefit from a small group intervention targeting anxiety?

If yes to both, please list student names:

We are also looking for students who: (a) have regular attendance, so they are present for and able to benefit from the group intervention; (b) are not currently receiving another social-emotional-behavioral intervention at school; (c) are not, to your knowledge, currently receiving outside services or support for anxiety.

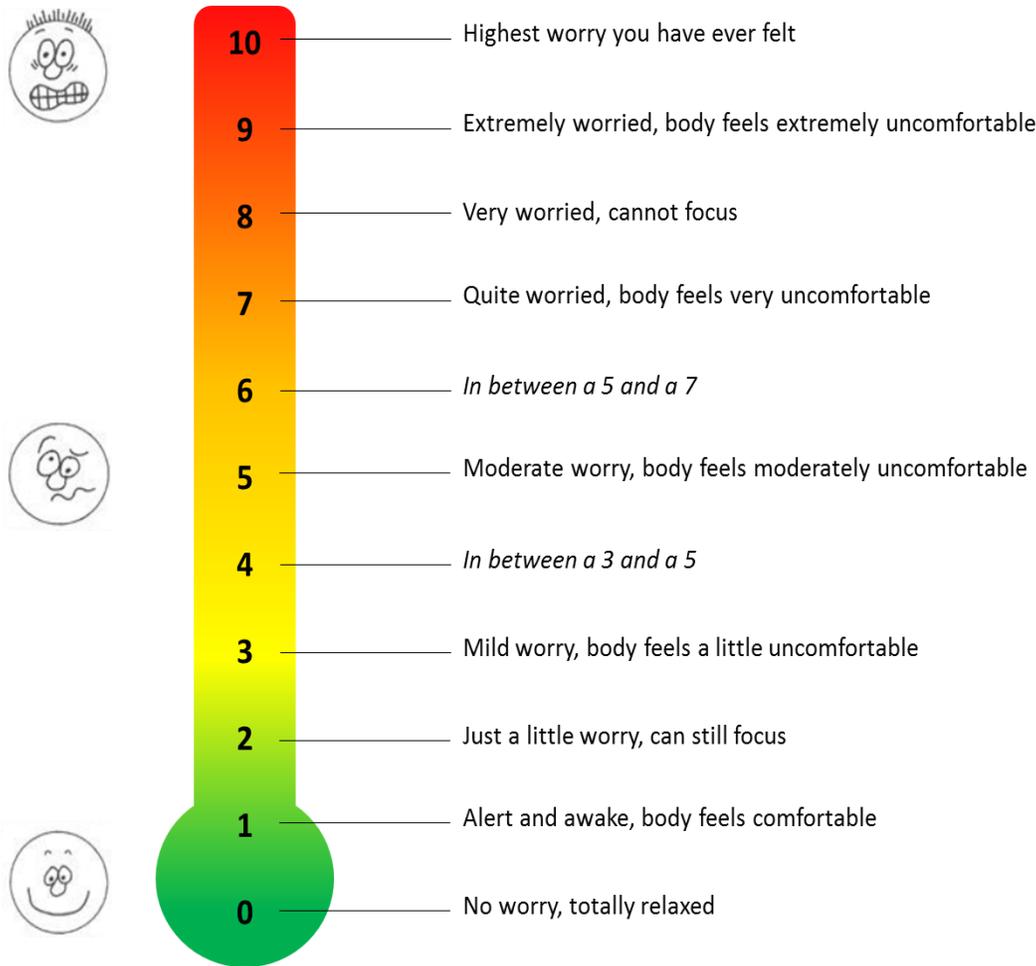
Please list the names of students who may meet these criteria and benefit from the intervention:

*For each student, please briefly **describe** the student's anxious behavior and **identify** the most problematic time for these behaviors in the classroom.*

Appendix B

Worry Thermometer Worksheet

Directions: You are going to rate your feelings of worry on a scale from 0 to 10. Imagine you have a ‘worry thermometer’ to measure your feelings according to the following scale. Circle the number that matches how you feel today.



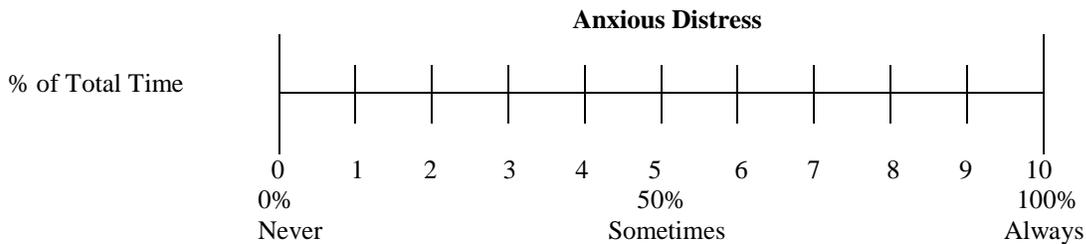
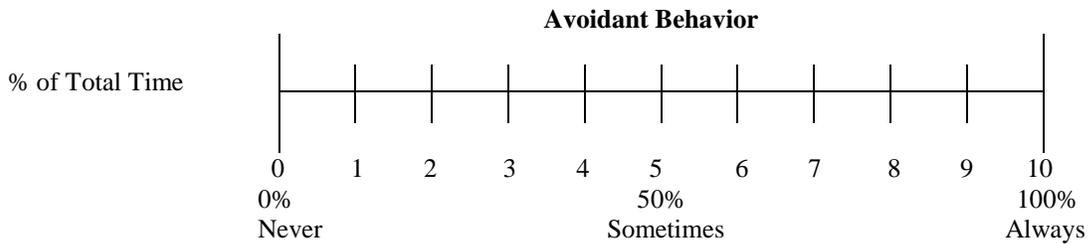
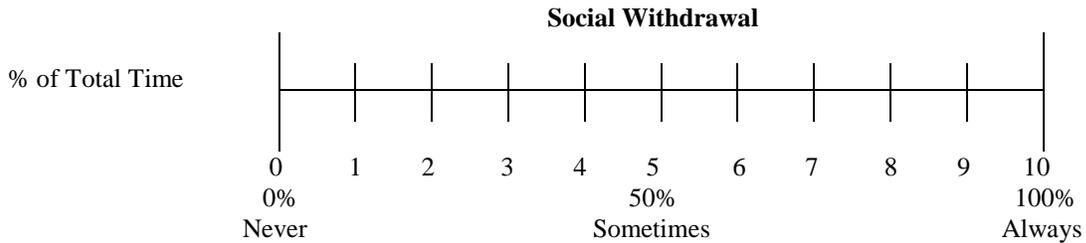
Why did you select that worry rating today?

Appendix C

Direct Behavior Rating (DBR) Form

Date: M T W Th F	Student Name:	Any changes in the typical classroom routine? If YES, describe (e.g., fire drill, assembly, field trip):
Observation Time Start: End: <input type="checkbox"/> Check if unable to observe	Behavior Descriptions: Social Withdrawal refers to the child isolating himself/herself from others (peers, teachers, or others). Examples may include “shyness”, reluctance to engage socially with others, limited class participation, and engagement in solitary activities. Avoidant Behavior refers actions taken to avoid/escape dealing with a stressor. Examples may include noncompliance, refusal to engage in activities, making up excuses to avoid activities, and not completing activities. Anxious Distress refers to verbal or nonverbal behavior indicative of anxiety. Examples include verbal expressions of worry, nervousness, or fear; restless behavior (e.g. fidgeting); somatic complaints (e.g., headaches, stomach aches), appearing “tense”, appearing tearful or crying, and trembling or shaking.	

Directions: Place a mark along the line that best reflects the percentage of total time the student exhibited each target behavior. Note that the percentages do not need to total 100% across behaviors since some behaviors may co-occur.



Appendix D

TGFG Feedback Form

Ratings

Directions: Think about the Think Good Feel Good group that you have been attending. After reading each sentence, circle/tell me the number that matches what you think about it.

		I really disagree	I kind of disagree	I kind of agree	I really agree
1	I liked this group.	1	2	3	4
2	This group helped me.	1	2	3	4
3	I will keep using the things I learned in group.	1	2	3	4
4	I would suggest this group to friends.	1	2	3	4

Interview Questions

1. What did you like about the group? What were your favorite parts?

2. What did you not like about the group? What were your least favorite parts?

3. Do you think the group helped you? How did it help you?

4. What other thoughts do you have about the group? Is there anything else you want to share?

Appendix E

Fidelity of Implementation Checklist

Intervention Steps	Step Completed?	
1) Interventionist greeted students and welcomed them to group	Y	N
2) Interventionist reviewed group rules	Y	N
3) Interventionist led the group in student check-in	Y	N
4) Interventionist recapped the previous session	Y	N
5) Interventionist introduced the day's session topic	Y	N
6) Interventionist presented lesson content	Y	N
7) Interventionist led the group in practice via worksheet or activity	Y	N
8) Interventionist led a group share about session content and activity	Y	N
9) Interventionist summarized the day's lesson (<i>i.e., what we did, what we practiced, what to do for next lesson</i>)	Y	N
10) Interventionist provided feedback to group on behavior and participation	Y	N
<i>Total Percent Fidelity of Implementation</i>		