

A RANDOMIZED TRIAL OF THE *SELF-MANAGEMENT TRAINING AND
REGULATION STRATEGY (STARS)*: A SELECTIVE INTERVENTION FOR STUDENTS
WITH DISRUPTIVE BEHAVIORS

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ABSTRACT

AARON M. THOMPSON: A Randomized Trial of the *Self-Management Training And Regulation Strategy (STARS)*: A Selective Intervention for Students with Disruptive Behaviors

(Under the direction of Natasha K. Bowen)

To attain academic goals, school personnel must effectively manage 20% of students who engage in the disruptive behaviors that interrupt instruction, create teacher stress, and contribute to poor student outcomes. Without effective strategies, school personnel often respond to disruptive students with ineffective authoritarian tactics, exclusionary policies, and special education referrals. However, federal policies aim to improve student outcomes and reduce special education referrals. To achieve these goals, schools are integrating universal, selective, and indicated practices and programs in tiered response models. Though many effective universal programs exist, only a few selective programs are available. The few available and widely-used selective strategies are rooted in behaviorism, managed by school personnel, and do not integrate scientifically-based efforts that improve self-management outcomes for students. The purpose of the dissertation was to study the effectiveness of STARS, a manualized self-monitoring program designed to be a selective strategy within a tiered response model. The study relied upon a randomized trial with 108 disruptive students across 42 classrooms and 7 schools. Results indicated STARS was feasible, acceptable, and related to improvements in behavior, social competence, authority acceptance, and student-teacher relations. Mediation models confirm direct instruction through STARS in social competencies caused improvements in student behaviors.

To Josie, and our daughter, Olive—the brightest stars in my universe.

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ABBREVIATIONS

AAP	American Academy of Pediatrics
AUTH	Authority Acceptance
AUTO	Autonomy
BEHAV	Behavior
BEP	Behavior Education Program
CASEL	Collaborative for Academic, Social, and Emotional Learning
CCC-TF	Carolina Child Check List-Teacher Form
CICO	Check in Check out
CMS	Children's Motivation Scale
COGCON	Cognitive Concentration
ED	Emotional Disturbance
ES	Effect Size
ESSP	Elementary School Success Profile
FRIENDs	Student Rated Peer Relations
FRL	Free and Reduced Lunch
GBG	Good Behavior Game
H.R.	House of Representatives
ID	Identification
IDEA	Individuals with Disabilities Education Act
LCQ	The Learning Climate Questionnaire
NCLB	No Child Left Behind
LD	Learning Disability
LIKEt	Teacher Rated Student Peer Relations
MOTIV	Motivation

OD	Optimal Design
OSEP	Office of Special Education Programs
PBIS	Positive Behavior Interventions and Supports
REG	Regular Education
RELs	Student Rated Student-Teacher Relatedness
RELt	Teacher Rated Student-Teacher Relatedness
STARS	Self-Management Training And Regulation Strategy
SAFE	Sequenced, Active, Focused, and Explicit
SDM	Social Development Model
SDT	Self-determination Theory
SIC	STARS Intervention Checklist
SIRS-S	STARS Intervention Rating Scale-Student
SIRS-T	STARS Intervention Rating Scale-Teacher
SOCOM	Social Competence
SPED	Special Education
SSDP	Seattle Social Development Project
TSRQ	Teacher-Student Relationship Questionnaire
Tx	Treatment Assignment
USDOE	U.S. Department of Education

CHAPTER 1

INTRODUCTION

Disruptive behaviors are student actions that interfere with the social and academic progress of individuals in a school setting. To attain academic goals, most parents and teachers agree that students need to engage in positive social behaviors (Agenda, 2004; Bushaw & Lopez, 2010). However, 20% of students regularly display disruptive behaviors that interfere with academic achievement (American Academy of Pediatrics Committee on School Health [AAP], 2004; Brauner & Stephens, 2006; Hoagwood, 2003; Walker, Ramsey, & Gresham, 2004). Disruptive behaviors place disruptive students at risk for school failure and social and emotional maladjustment, interfere with the learning of their peers, increase stress and burnout for teachers, and erode the quality of a learning environment.

Although many individual and contextual factors are associated with school behavior, the behavior management approach employed by school staff is a critical factor in shaping student conduct at school (Oliver, Wehby, & Reschly, 2011). One common and ineffective management approach relies on authoritarian practices (Sugai & Horner, 2002).

Authoritarian practices are punitive and reactive strategies that include reprimands, loss of privileges, and exclusionary tactics such as detention, time out, and office referrals (Harry & Klingner, 2006; Losen & Ornfeld, 2002; Oliver & Reschly, 2007). In short, authoritarian approaches fail to provide instructional support in the skills necessary to increase positive social behaviors (Sugai & Horner, 2002). Studies suggest school personnel engage in authoritarian approaches because they lack the resources, skills, and confidence necessary to

adopt positive behavior management practices (Baker, 2005; Bromfield, 2006; Brouwers & Tomic, 2000; Ingersoll & Smith, 2003; Stoughton, 2007).

To increase the ability of school personnel to use positive behavior management practices, schools are implementing tiered response models. Tiered response models, which have emerged from No Child Left Behind (NCLB; 2001) and the reauthorized Individuals with Disabilities Education Act (IDEA; 2004), aim to replace ineffective, reactive, and authoritarian approaches with a variety of scientifically-based proactive and positive prevention practices and programs (Sugai & Horner, 2008). Although improving student outcomes through a tiered response model is a central aspect of NCLB (2001) and IDEA (2004), both laws also seek to simultaneously reduce referrals for special education services (Sugai & Horner, 2009; US Department of Education [USDOE], 2002).

To implement a tiered response model, school personnel organize effective universal, selective, and indicated practices and programs in a continuum. Universal strategies are provided to all students and studies suggest they improve outcomes for 80% of students (Sugai & Horner, 2008; Wilson & Lipsey, 2008). Selective strategies are more intensive and are provided to about 15% of students. Indicated strategies are individualized (e.g., special education) and are provided about 5% of students (Sugai & Horner, 2008).

Prior studies suggest tiered response models are related to improvements in social and academic outcomes, reductions in authoritarian practices (e.g., office referrals, in- and out-of-school suspensions, expulsions), and decreases in special education referrals (Bradshaw, Koth, Bevans, Ialongo, & Leaf, 2008; Horner et al., 2009; VanDerHeyden, Witt, & Gilbertson, 2007). Properly implemented tiered response models, however, require feasible and effective prevention strategies at all levels of the continuum. Although many universal

strategies are currently available, there are few scientifically-based selective strategies (Sugai & Horner, 2008). Furthermore, the most commonly used selective strategies are based upon the principles of behaviorism (Cooper, Heron, & Heward, 2007). Such approaches often rely on externally managed contingencies, focus on short-term behavioral goals, and fail to promote the development of self-management and self-regulation skills to encourage lasting behavioral change in students (Lane, Menzies, Bruhn, & Crnabori, 2011).

Prior research suggests school-based programs that improve self-management and self-regulation skills for students rely on the development of five interrelated social, emotional, and cognitive skills: social and self-awareness, self-management, relationship skills, and problem solving skills (Collaborative for Academic, Social, and Emotional Learning [CASEL], 2005). Furthermore, programs that improve student outcomes are organized around four instructional practices: (a) explicitly clarifying skills, (b) sequencing skills so basic skills provide a foundation for complex skills, (c) using active learning strategies to enhance engagement with skills, and (d) providing sufficient exposure to the skills (Durlak, Weissberg, Symnicki, Taylor, & Schellinger, 2011; Langland, Lewis-Palmer, & Sugai, 1998). Studies also suggest autonomy supportive opportunities interspersed throughout the instructional day allow students to practice the skills. In addition, when the intersection of skills and opportunities are met with supportive yet formative feedback, students develop competencies in positive and valued school behaviors that are self-managed and self-regulated (Pintrich, 1995, 2005; Pintrich & Schunk, 2002).

The purpose of this dissertation study was to examine the feasibility and effectiveness of *The Self-Management Training And Regulation Strategy (STARS)*. STARS is a selective intervention designed to be a component of a tiered response model to address disruptive

behaviors. STARS organizes direct instructional strategies to teach social and self-awareness, self-management, and problem solving skills. In addition, STARS structures autonomy supportive opportunities for students to practice the skills in a manner that promotes self-managed and self-regulated reasons for students to engage in positive school behaviors.

The study used a randomized design and focused on students in grades 4 and 5. It was hypothesized that teachers would report STARS as a feasible behavior intervention strategy, and students and teachers would report socially acceptable responses to STARS. It was also hypothesized that STARS students, compared to control students, would demonstrate improvements in teacher reported classroom behaviors and social competencies. Further, it was hypothesized that STARS students would report improved perceptions of autonomy and relations with their peers and teachers compared to students in the control condition.

The dissertation is organized into six chapters. Chapter 2 provides background information on the prevalence, consequences, and predictors of disruptive behaviors. Chapter 3 examines current policy, research, and practice initiatives to prevent and intervene in disruptive behaviors. Chapter 4 proposes a theoretical model to guide the development of interventions that integrate features of scientifically-based programs in a manner that also meets the criteria for inclusion within a tiered response model. Chapter 5 outlines the methods of the dissertation study to test the feasibility and effectiveness of the STARS program. Chapter 6 presents the results from the study. Lastly, chapter 7 examines the strengths and limitations of the study and positions the findings within current policy, practice, and research efforts to prevent and intervene in disruptive student behaviors.

CHAPTER 2

DISRUPTIVE BEHAVIORS

Statement of the Problem

Disruptive student behaviors are a serious problem for all students and school staff. Managing disruptive behaviors is a primary concern for school staff because teaching and learning are interrupted when students display disruptive behaviors. Disruptive behaviors contribute to chaotic classrooms, teacher stress, disorganized schools, and poor social and academic student outcomes. Because improving social and academic outcomes is a high priority of NCLB (2001) and the IDEA (2004), it is incumbent upon school personnel to utilize an array of scientifically-based programs and practices that reduce disruptive behaviors and encourage the development of positive social behaviors.

Definition and Prevalence of Disruptive Behaviors

In this study, disruptive student behaviors are defined as acts that (a) interfere with the social and academic functioning of individuals; (b) harm a child, his or her peers, or adults; and (c) place a child at risk for later developmental problems. Disruptive behaviors include direct and indirect forms of aggression (Crick & Grotpeter, 1995; Dodge & Coie, 1987; Parke & Slaby, 1983), overt and covert antisocial behaviors (e.g., stealing, bullying, lying, betrayal; Kaiser & Rasminsky, 2009), maladaptive thoughts and feelings (e.g., withdrawal, anxiety), and common acts of insubordination (e.g., disrespect, arguing, noncompliance). Disruptive behaviors encompass a range of externalizing behaviors and

internalizing maladaptive thoughts and feelings because these conditions interfere with the quality of a learning environment (Kaiser & Raminsky, 2009).

Although disruptive behaviors may be defined in a myriad of ways, a substantial number of students exhibit the behaviors. Roughly 20% of students display disruptive behaviors to a degree that interrupts normal academic and social functioning (AAP, 2004; Brauner & Stephens, 2006; Walker, 2004). Twenty percent equates to about 3 or 4 students in the average classroom (Hoagwood, 2003). Of the 20% of students who are disruptive, approximately 11% display significant levels of disruptive behaviors whereas 5% exhibit extreme forms of disruptive behaviors (e.g., aggressive or antisocial behaviors; AAP, 2004).

Consequences of Disruptive Behavior

Disruptive behaviors negatively impact students who exhibit the behaviors, their peers, school staff, and the broader school climate. To begin, disruptive behaviors are the most common reason students are removed from classrooms (National Association of School Psychology, 2010). Repeated removals interrupt instruction and increase the likelihood of course failures for disruptive students (Gresham, Lane, & Lambros, 2000; Nelson, Stage, Duppong-Hurley, Synhorst, & Epstein, 2007). These academic difficulties are related to retention and dropout, and studies suggest 50% of disruptive students drop out of school—twice the dropout rate of students without disruptive behaviors (Bullis & Cheney, 1999; Frank, Sitlington, Carson, 1995; Roderick, 1994; Walker et al., 2004). Among disruptive students who dropout, 70% are arrested within six months (Kauffman & Brigham, 2009; Kauffman & Landrum, 2006). Displays of disruptive behaviors are also associated with other negative life-course outcomes, including failed social relations, low economic status, high

rates of criminal behavior, poor mental health outcomes, and a propensity to subsist on welfare (Dodge & Crick, 1990; US Department of Health and Human Services, 2009).

A second consequence of disruptive behaviors is experienced by the agetates of disruptive students. Forty-two percent of elementary school teachers report disruptive students interfere with the learning of their peers on a daily basis (USDOE Institute for Education Sciences, 2006). Research suggests disruptive behaviors cause a loss of instructional time at a rate of four hours per week or 144 hours per student over the course of one school year (Walker et al., 2004). Without intervention in primary school, disruptive behaviors often worsen and the amount of lost instructional time increases when students enter middle school (USDOE Institute for Education Sciences, 2004). Furthermore, in the presence of disruptive students, some research suggests students who are generally compliant may be more likely to engage in disruptive behaviors (Agenda, 2004; Dishion, 2000).

A third consequence of disruptive student behaviors is the stress experienced by school staff (Clunies-Ross, Little, Kienhuis, 2008; Grayson & Alvarez, 2008; Hastings & Bham, 2003; Joseph & Strain, 2003). School personnel, in some cases, are the targets of disruptive student actions. For example, the 2006 School Survey on Crime and Safety estimated 5% to 9% to of school personnel reported being disrespected and verbally abused by disruptive students on a weekly basis (USDOE Institute for Education Sciences, 2006). These experiences drive highly qualified school personnel to feel frustrated, burned out, and prematurely request transfers or leave education altogether (Brouwers & Tomic, 2000). A 2005 survey of highly qualified teachers revealed that 53% who requested transfers and 44% who quit cited disruptive student behavior as the main reason for their decision. Transfers

and early exit of highly qualified professionals creates instability in the culture of a school (USDOE Institute for Education Sciences, 2005).

Finally, the culture of a school is damaged by disruptive student behaviors. That is to say the collective efficacy, attitudes, and trust between students and staff are negatively affected by disruptive behaviors (Gruenert, 2008; Tableman & Herron, 2004). Schools with high levels of disruptive behaviors are also characterized by low academic performance (McEvoy & Welker, 2000). Furthermore, in schools with above average levels of disruptive student behaviors, students experience bullying at higher rates, student-teacher relations are caustic, and student and staff absences and school personnel turnover is higher than average (Hawkins, Farrington, & Catalano, 1998; USDOE Institute for Education Sciences, 2005).

Precursors of Disruptive Behavior

All students arrive in classrooms with unique profiles conditioned by early life experiences. Life experiences shape cognitive perceptions, affective responses, and behavioral patterns of children. Exposure to risk factors early in life prompts many children to adopt patterns of disruptive behavior. Although the interdisciplinary research examining the development, persistence, and intervention in disruptive behaviors focuses on a variety of causal factors, not all of those factors are feasible targets for school-based interventions.

For example, low income and urban communities harbor stressors such as poor housing and neighborhood violence whereas rural communities are socially isolated and lack support services (Capaldi, DeGarmo, Patterson, & Forgatch, 2002; Spaulding et al., 2010). Community level barriers and risks intensify existing family stressors and complicate parenting. Parenting behaviors (e.g., coercive parenting, low parent-school involvement) and family characteristics (e.g., family violence, large family size) are strong predictors of child

behaviors (Farrington, 1991; Raine, 1993). Parent and family factors, such as low income, parent or sibling criminal behavior, and family substance abuse are associated with the development of disruptive behaviors (Coie & Dodge, 1998; Farrington, 1991; Frick et al., 1991). The parent-child relationship shapes the interactional patterns and cognitive models that guide behavior when children reach school age (Patterson, 1982). Upon reaching school age, a child with disruptive behavior patterns shaped by early life experiences will face many challenges in meeting social and academic expectations (Eccles & Roeser, 2009).

In addition to the contextual risk factors related to disruptive behaviors, researchers have identified a host of biopsychological structures and processes associated with disruptive behaviors. For example, many children with disruptive behaviors have cognitive deficits that complicate social information processing (Crick & Dodge, 1994; Dodge, 1980; Gross & Oliver, 2003; Halperin, 1995). Cognitive deficits and maladaptive processing abilities shape temperament or personality-like traits marked by an inability to self-regulate (Dodge & Crick, 1990; Dodge & Pettit, 2003; Huesmann, 1988). Self-regulation, also known as effortful control, is a construct defined by many nested genetic, neurological, and psychophysiological processes (Rothbart, 1989). The nested processes shape our capacity to effortfully select a subdominant response (e.g., remain calm) while controlling a dominant reaction (e.g., anger; Rothbart, Sheese, & Posner, 2007).

The inability to self-regulate is often accompanied by inept social competencies and problem solving abilities (Dodge & Pettit, 2003). Diminished social aptitudes and problem solving skills increase the likelihood of rejection by peers who prefer positive social interactions (Asher & Coie, 1990; Mann & Reynolds, 2006; Rubin, Bukowski, & Parker, 1998; Walker et al., 2003). Rejection by prosocial peers limits opportunities for positive

social relationships and facilitates alliances with students who endorse patterns of disruptive behaviors (Dishion, Andrews, & Crosby, 1995; Dishion, McCord, & Poulin, 1999; Dishion, 2000). These factors can act as a catalyst that increases exposure to a multitude of adverse events disrupting typical developmental pathways (Moffit, 1993; Rutter, 2001).

Although the community, parent, and family factors shaping student characteristics and conditioning peer relations may seem insurmountable to school staff, ample evidence exists to suggest children of any age respond positively to contextual conditions that promote the development of self-managed and self-regulated behaviors (Durlak et al., 2011; Wilson & Lipsey, 2008). For example, a fundamental influence maintaining or diminishing disruptive student behaviors is the behavior management approach adopted by school personnel (Lane et al., 2011). Broadly speaking, school staff members can be reactive and punitive in their approach to disruptive students, or they can engage in emerging proactive and supportive activities that teach students skills to develop positive social behaviors. However, without the proper materials, training, and skills necessary to embrace a preventative and instructional approach, school personnel tend to rely upon authoritarian strategies (Bromfield, 2006; Carter, Lane, Pierson, & Stang, 2008; Kokkinos, Panayotou, & Daavazoglou, 2004; Mellin, 2009; Skiba, Peterson, & Williams, 1997).

Authoritarian behavior management strategies exist at the classroom and school-wide levels. In the classroom, authoritarian practices may consist of reprimands, loss of privileges, and office referrals (Clunies-Ross et.al, 2008). At the school-wide level, authoritarian strategies may include exclusionary policies such as detentions, in- and out-of-school suspensions, and expulsions (Gresham, 2004; Maag, 2001). Under these conditions, school personnel rely upon surveillance cameras, metal detectors, and resource officers to monitor

and control student behaviors (Agenda, 2004). In schools where authoritarian and exclusionary behavior management styles prevail, students are also more likely to be referred to the office and for special education services for repeated disruptive behaviors (Donovon & Cross, 2002; Tobin & Sugai, 1996). In summary, authoritarian approaches are ineffective, erode trust and communication between students and school personnel, do not provide relevant instructional supports in positive social behaviors, and do not assist school personnel to cultivate school success for all students (Carter et al., 2008; Farmer, 1999; Kern, Hilt-Pahahon, & Sokol, 2008; Skiba & Peterson, 1999, 2000; Wentzel, 2002).

By contrast, when school personnel use emerging preventative behavior management practices, they promote the development of supportive student-teacher relations (Colvin & Sprick, 1999; Lewis & Sugai, 1999). Supportive and trusting student and teacher-relationships are the cornerstones of a positive school environment necessary for improving the academic and social success for all students (Goldstein & Brooks, 2007; Wentzel, 2002). However, improving relations and creating a positive school culture will only occur when school personnel provide instructional supports to students in self-management and self-regulation skills (Durlak et al., 2011). To achieve this goal, school leaders must endorse a preventative approach by investing in the training and materials to help school personnel use scientifically-based practices and programs that teach positive social behaviors (Sugai & Horner, 2008). When school leaders value an instructional approach to the social and emotional development of students, efforts to implement such approaches are employed by school personnel with increased fidelity (Benbenishty & Astor, 2005). Evidence-based programs and practices that are implemented with fidelity improve the likelihood of positive student outcomes (Wilson & Lipsey, 2008).

In summary, although a vast amount of research suggests that disruptive behaviors develop by the way of early life interactions with family and community factors, intervening in such factors is not always practical or feasible for school personnel. However, much can be done within the context of the school to help students learn adaptive skills in self-management and self-regulation. To begin achieving this task, school personnel must embrace new instructional approaches for teaching students social and emotional competencies. These instructional approaches require school leaders to invest in the training, resources, and time needed to encourage school personnel to teach students valuable interpersonal skills. To advance the efforts of school personnel to adopt an instructional approach for teaching students social and emotional skills, the following chapter summarizes the initiatives to interrupt the persistence of disruptive behaviors and encourage the development of positive social behaviors within the school setting.

CHAPTER 3

SCHOOL-BASED INITIATIVES IN THE PREVENTION OF DISRUPTIVE BEHAVIOR

This chapter will summarize current policy, practice, and research initiatives to prevent and intervene in disruptive student behaviors. Regarding policy, a key goal of NCLB (2001) and IDEA (2004) is to improve student outcomes by combining universal, selective, and indicated practices and programs in a tiered response model. In addition to improving student outcomes, both laws also seek to minimize reliance upon indicated supports (i.e., special education services). For example, §300.37(a)(3) of IDEA (2004) encourages schools to use “a process that determines if a child responds to research-based interventions prior to identifying a child with a disability, especially young children from minority backgrounds” (US Federal Register, 2006, p. 46647). In short, a tiered response framework offers a flexible service model without the cumbersome evaluation and labeling procedures formerly required to access more intensive programs and practices.

School personnel who want to adopt a tiered response model can choose from many available universal support programs judged to be effective (Durlak et al., 2011; Wilson & Lipsey, 2008). However, a properly designed tiered response model is predicated on the fact that some students will require more intensive services. For the estimated 20% of students (i.e., 15% for selective and 5% for indicated services) who may benefit from more intensive programmatic and practice supports, only a few selective strategies exist (Sugai & Horner, 2008). Without research-based selective supports in a tiered response continuum, the likelihood that a disruptive student will be referred for indicated services increases.

This chapter will address the lack of selective services to be used within a tiered response model. First, the features of effective school-based supports (i.e., practices and programs) will be summarized. Second, the basic steps for organizing effective supports in a tiered response model will be summarized. Third, because NCLB and IDEA seek to improve outcomes and reduce the use of indicated services, the criteria for universal and selective supports will be examined and contrasted against the features of effective school-based supports. From this contrast, self-monitoring interventions emerge as an integrative strategy that combines the features of effective supports in a manner that also meets the criteria of a tiered response model. Finally, to inform the development of self-monitoring programs, the current state of the research on self-monitoring will be summarized.

Features of Effective School-Based Supports

School-based supports include both scientifically-based practices and programs. Effective practices that assist teachers to help students learn positive social behaviors include autonomy support, which increases student involvement and choice surrounding school-related tasks (Lane et al., 2011). When students have increased input and choice, their sense of self-determination, responsibility, and self-control are enhanced (Lane et al., 2011). Autonomy support is also the foundation of a trusting relationship between students and teachers (Wentzel, 2002). When students and teachers have trusting relations, students are more likely to cooperate with requests to engage in school-related tasks (Wentzel, 2008). In addition to autonomy support and quality relations, teachers are more successful at helping students develop positive behavior patterns when they provide rigorous instruction in competencies relevant to school-related tasks (Connell, Spencer, & Aber, 1994; Deci, Schawartz, Sheinman, & Ryan, 1981). Students who are competent at negotiating tasks

relevant to the context are more likely to value and repeat those tasks (Lane et al., 2011).

Although a variety of packaged programs organize personal and interpersonal skills for students to learn positive social behaviors, not all programs contain features that improve student capacities for self-management and self-regulation of positive social behaviors.

Studies suggest social and cognitive skill programs are more successful when they focus on the development of five interrelated skills: social and self-awareness, self-management, relationship, and problem-solving skills (CASEL, 2005). Student acquisition of the skills is enhanced by programs that use four instructional practices organized around the acronym *SAFE* (i.e., *Sequenced skills training*, *Active learning modalities*, *Focused and sufficient exposure*, and *Explicit instruction* organized in a manualized format; Durlak et al., 2011; Lane et al., 2011; Langland et al., 1998). Compared to social and cognitive skill programs without SAFE features, programs organized by SAFE instructional practices are more effective at improving student social skills ($ES = 0.69$), attitudes ($ES = 0.24$), behaviors ($ES = 0.28$), conduct problems ($ES = 0.24$), stable emotions ($ES = 0.28$), and academic abilities ($ES = 0.28$; Durlak et al, 2011).

Lastly, school prevention programs are more effective when school staff—as opposed to external intervention agents or researchers—teach, integrate, and positively reinforce student displays of positive behaviors throughout every school day (Durlak et. al., 2011). For example, the *Good Behavior Game* (GBG; Barrish, Saunders & Wolf, 1969) is a universal strategy that divides students into cooperative teams where each team earns points for displaying predefined positive behaviors. Numerous studies of the GBG suggest integrating skills, opportunities, and reinforcements over the course of the instructional day improve proximal and distal student outcomes (Barrish et al., 1969; Ialongo, Poduska, Werthamer, &

Kellam, 2001). Although meta-studies suggest programs with the above features improve student outcomes (Durlak et al., 2011), the effectiveness of these programs and practices can be increased by combining them in a tiered response model (Wilson & Lipsey, 2008).

Tiered Response Models: A Framework for Organizing Effective Programs

The recent reauthorizations of IDEA (1997, 2004) sanctioned the USDOE's Office of Special Education Programs (OSEP) to fund the development of the National Technical Assistance Center for Positive Behavior Interventions and Supports (PBIS; Sugai & Horner, 2009). In doing so, the OSEP extends the federal government's pledge to assist schools to implement tiered response models to achieve two goals: promote healthy student outcomes and reduce referrals for indicated services. The goal of the OSEP Technical Assistance Center for PBIS is help schools identify, organize, and evaluate individual practices and programs within a tiered response framework (Sugai & Horner, 2009). Although the practice and program elements in a tiered response model may vary from school to school, the basic implementation process and criteria underlying these elements do not.

Tiered response models: Implementation and supporting research. To implement a tiered response model, school personnel begin by collecting prescreening assessment data. The prescreening data are used to identify individuals and groups of students with performance deficits. Second, staff members identify a range of scientifically-based practices and programs to optimally mitigate the identified deficits. Third, the supports are organized in a continuum and sequenced by degrees of application intensity (i.e., from less intensive to more intensive). Finally, current student performance is paired with the appropriate supports.

To evaluate the success of the selected practices and programs, ongoing data are necessary requirements of an effective tiered response model. School personnel use ongoing

data to inform a systematic decision making process whereby baseline student performance is compared to posttest performance. If posttest scores suggest performance improved following the faithful allocation of effective strategies, then the student is considered to be responsive to the supports (Burns & Gibbons, 2008). If, however, student performance has not improved to the level desired following allocation with fidelity, the student is considered unresponsive and more intensive efforts may then be considered (Burns & Gibbons, 2008).

To date, no meta-reviews of tiered response models have been conducted because tiered response models are frameworks for organizing scientifically-based supports and are not programs themselves. However, a three-year randomized study conducted by Horner and colleagues examined the process of implementing a tiered response model using 30 treatment and 30 control schools. In the study, treatment school personnel implemented a tiered response model with training and consultation from researchers. By year three, results from the study suggested intervention schools, compared to control schools, demonstrated improvements in student and staff perceptions of safety ($ES = 0.23$), a higher percent of students meeting or exceeding state reading assessments ($ES = 0.38$), and fewer disruptive student behaviors ($ES = 0.30$; Horner et al., 2009). In a second 3 year study, Bradshaw and colleagues randomized 21 elementary schools to a tiered response model and 16 schools to a control condition. Results revealed significant mean improvements for intervention schools on personnel reports of school climate ($ES = 0.29$), availability of support resources ($ES = 0.34$), staff collaboration ($ES = 0.26$), and student academic and social performance outcomes ($ES = 0.24$; Bradshaw et al., 2008). Both studies showed tiered response models have mild to modest effects for improving valuable student and school related outcomes.

Though tiered response models are frameworks for organizing effective practices and programs, not all programs meet the criteria for use within a tiered framework. That is, some programs may not lend themselves to the processes that improve the effectiveness of a tiered response model. For example, not all programs provide ongoing data to assess student performance. To assess the effects of universal supports, ongoing data may consist of broad and infrequent indicators like office referrals, attendance reports, or periodic assessments (i.e., tests, quizzes, performance exams; VanDerHeyden, Witt, & Barnett, 2005). However, to assess more intensive efforts (i.e., selective and indicated), ongoing data should be collected more frequently and should be more precise in measuring the performance deficit (VanDerHeyden et al., 2005). Frequent and precise ongoing data will provide school personnel with sensitive indicators to quickly assess whether a package of supports appears to improve performance or whether more intensive supports are required. To assist school personnel to select programs that inform the decision making process central to a tiered response model, the PBIS website lists basic criteria of universal and selective supports.

OSEP criteria for universal supports. The OSEP Technical Assistance Center for PBIS lists the following criteria of universal supports:

- program elements are provided to all students
- address measureable outcomes that align with state standards
- establish clearly worded expectations for students
- include evidence-based programs and practices to help students meet expectations
- ongoing data are collected to assess fidelity and student responsiveness (2011a).

Recent meta-analyses suggest universal programs are related to modest but significant improvements in student attitudes ($ES = 0.23$), behaviors ($ES = 0.26$), emotional stability

(ES= 0.27), academic performance (ES = 0.26; Durlak et al., 2011) and significant but modest reductions in disruptive behaviors (ES = 0.21; Wilson & Lipsey, 2007). Examples of scientifically-based universal supports that meet OSEP criteria include the GBG (Barrish et al., 1969), *Second Step* (Cooke et al., 2007), *Providing Alternative THinking Strategies* (PATHS; Kusche & Greenberg, 1994), and *Making Choices* (Fraser, Nash, Galinsky, & Darwin, 2000). However, a properly implemented tiered response model assumes 20% of students will require access to universal strategies as well as more intensive supports.

OSEP criteria for selective supports. The OSEP Technical Assistance Center for PBIS lists that selective supports should:

- reduce teacher burden
- promote student choice and self-management
- provide direct skills in performance deficits
- allow feasible application for small groups of students
- align with the goals of primary supports
- allow immediate and flexible access for students
- provide frequent and ongoing data to assess fidelity and responsiveness (2011b).

A recent meta-analysis of 108 randomized studies of selective support programs indicate that more intensive interventions are effective (ES = 0.29; Wilson & Lipsey, 2007). The study examined a variety of selective programs, including direct skills instruction, group counseling, teacher managed behavioral strategies, and student self-monitoring strategies. Although the meta-analysis concluded selective interventions were associated with significant improvements in behavioral outcomes (Wilson & Lipsey, 2007), not all of selective strategies meet the OSEP criteria for use within a tiered response model.

To begin, direct skills instruction and group counseling may provide students with intensive skill development aimed at improving self-management. Direct skills instruction and counseling reduce teacher burden, can be provided to small groups of students, and can be structured to align with universal supports (Lane, Wehby, & Cooley, 2006). However, direct skills instruction and group counseling do not provide frequent and ongoing data. Though quizzes or tests may probe knowledge—these probes do not provide the regular and focused data necessary to make timely decisions surrounding a student’s responsiveness.

Next, teacher managed behavioral strategies are the most common selective supports used in schools (Goldstein & Brooks, 2007). Two widely-used teacher managed behavioral strategies include the *Behavior Education Program* (BEP; Crone et al., 2010; Hawken, MacLeod, & Rawlings, 2007) and the *Check in Check out* strategy (CICO; Filter et al., 2007; Todd, Campbell, Meyer, & Horner, 2008). In general, the strategies rely on a functional assessment process to identify the antecedents and consequences maintaining disruptive behaviors. School personnel then manipulate events surrounding the behaviors and collect data to assess changes in the target behaviors. The CICO and BEP are two approaches to assist school personnel to engage in the process of recording data on student responses to these contextual manipulations. Prior research suggests the CICO ($ES = .48 - 1.04$; McIntosh, Campbell, Carter, & Dickey, 2009) and BEP ($ES = .37$; Hawken et al., 2007) are effective and feasible practices that can be used with small numbers of students. The strategies also align with universal supports and provide frequent and ongoing data to assess fidelity and student responsiveness (Chafouleas, Riley-Tillman, Sassu, LaFrance, Patwa, 2007; Riley-Tillman, Chafouleas, & Briesch, 2007). However, teacher managed behavioral

strategies do not provide direct instruction, opportunities for student autonomy, or impart strategies to enhance self-management and self-regulation skills for students.

Lastly, self-monitoring interventions have been used to address behavioral and academic deficits (Lane et al., 2011). To engage in self-monitoring, students need direct instruction in the steps of the self-monitoring process. Prior studies of self-monitoring strategies suggest the procedures are feasible, can be used with small groups of students, and align with universal supports (Mooney, Ryan, Uhing, Reid, & Epstein, 2005). Furthermore, when coupled with teacher monitoring strategies, self-monitoring interventions provide frequent and ongoing data necessary to assess fidelity and student responsiveness in a timely manner. In short, though many modalities are commonly used as selective strategies, a self-monitoring approach merges the features of effective school-based programs that facilitate self-managed behaviors while meeting the OSEP criteria for use within a tiered framework.

Self-Monitoring: A Merger of OSEP Criteria and the Features of Effective Programs

To begin, self-monitoring interventions provide a way for teachers to support student autonomy (Lane et al., 2011; Mooney et al., 2005). Self-monitoring, also referred to as self-management or self-regulation, supports student autonomy by increasing involvement and ownership for students in the intervention process. Increased involvement and ownership facilitates a sense of responsibility, participation, and cooperation among students (Deci, 1995; Wentzel, 2008). Autonomy support also increases the likelihood that students feel self-determined and invested in a successful outcome of the intervention (Carter et al., 2008).

Next, students require direct instruction in the social and cognitive skills necessary to engage in the self-monitoring process. The skills include communication, decision-making, and problem-solving skills. In addition, students must learn skills in social and self-

awareness, self-management, self-evaluation, and relationship skills (Fantuzzo & Polite, 1990; Lane et al., 2011; Wehmeyer & Field, 2007). Moreover, research suggests the acquisition of self-monitoring skills can be improved if a manual or advanced organizer is used to assemble and sequence the skills (Lane et al., 2011; Langland et al., 1998). When a manual or advanced organizer uses *SAFE* instructional procedures, research suggests that student procurement of the skills will be enhanced (CASEL, 2005; Durlak et al., 2011).

Lastly, because self-monitoring strategies can be interspersed throughout the course of the instructional day, students are presented with many opportunities to practice the skills. When student self-monitoring is combined with teacher monitoring of student behavior, the student and teacher data can inform two feedback processes. The first process involves a formative feedback loop that can enhance skill acquisition by comparing the two views in a data-based appraisal process (Carter, Lane, Pierson, & Glasser, 2006; Wehmeyer & Field, 2007). The second process uses the teacher data to assess both the degree of fidelity (i.e., faithful allocation of the intervention) as well as a student's responsiveness—two important features of a selective support program within a well-designed tiered response model.

Many independent studies and several meta-reviews suggest self-monitoring strategies are associated with positive student outcomes. Some researchers have recently expanded upon this literature to provide teachers with basic guidance on using self-monitoring procedures in the classroom (Lane et al., 2011; Shapiro, Durnan, Post, & Levinson, 2002). However, to date, no manualized self-monitoring programs have organized the requisite skills using effective instructional practices. To better inform the development of a self-monitoring program that integrates the features of effective school-based programs, the next section will highlight three meta-analyses of studies on self-monitoring strategies.

Research on self-monitoring. A meta-analysis conducted by Mooney and colleagues reviewed 22 studies that explored the effects of self-monitoring on the academic outcomes of disruptive students (Mooney et al., 2005). The results suggested self-monitoring was related to improved academic performance with extremely large effect sizes ($ES = 1.9$; Mooney et al., 2005). However, the 22 studies relied upon small sample sizes (1 – 12 students) which likely inflated the summary estimates.

Two other meta-studies examined the effects of self-monitoring on behavioral outcomes. The first of these studies was conducted by Fantuzzo and colleagues who suggested self-monitoring improved behavioral outcomes with enormous effects ($ES = 2.30$). Again, the large effect size estimates may be due to small sample sizes in all of the studies reviewed. However, an important contribution by Fantuzzo and colleagues was to list the 11 problem solving and behavior skill competencies necessary for students to participate in self-monitoring (Fantuzzo & Polite, 1990; Fantuzzo, Rohrbeck, & Azar, 1987). By doing so, the researchers noted that, on average, only 8.8 of the 11 self-monitoring skills were actually managed by students (Briesch & Chafouleas, 2009; Fantuzzo et al., 1987, 1990).

Lastly, Briesch and Chafouleas (2009) examined 30 self-monitoring studies with 106 students. Similar to the Fantuzzo reviews, Briesch and Chafouleas focused on behavioral outcomes and reported even larger average effects than the previous studies ($ES = 4.11$). Again, nearly all of the studies reviewed relied upon single subject designs and small samples (1 – 8 students). Furthermore, Briesch and Chafouleas noted students only managed 7.6 of the 11 self-monitoring steps; less than Fantuzzo and colleagues observed three decades earlier. In summary, the state of research underlying the success of self-monitoring interventions suggests the approach is effective. However, the estimates used to assess the

effectiveness of self-monitoring are derived from single subject or small group designs as well as inconsistent allocation of intervention procedures.

Conclusions

Both NCLB (2001) and IDEA (2004) encourage the use of scientifically-based universal and selective practices and programs within a tiered response model to improve student outcomes and reduce referrals for special education services (Sugai & Horner, 2009). Prior studies do suggest that combining universal and selective programs in a tiered response framework improves valuable school and student outcomes (Bradshaw et al., 2008; Horner et al., 2009). By offering effective universal ($ES = 0.21$) and selective ($ES = 0.29$) programs delivered by school-based personnel with fidelity, tiered response models can facilitate the attainment of two valuable NCLB and IDEA goals: improving student outcomes and decreasing special education referrals. That is, if 20% of a school's students engage in disruptive behaviors, then average program effect sizes of 0.21 and 0.29 would reduce base prevalence rates of high risk students by 15% - 13%, respectively. This translates into a 25% - 33% reduction in the number of students who may require indicated services (Wilson & Lipsey, 2008).

To achieve these goals, the OSEP Technical Assistance Center for PBIS provides guidance to school personnel in the proper implementation of a tiered response model. The center provides assistance for implementing the model along with basic criteria for selecting program inputs that increase the effectiveness of a tiered approach. Although many scientifically-based universal programs are available (Durlak et al., 2011), there are few selective supports that meet the OSEP criteria for use within a tiered response model. Among the few selective supports available, the most widely-used strategies rely upon the principles

of behaviorism. Although prior studies of behavioral strategies (i.e., the BEP and CICO) suggest the practices are feasible and effective, behavioral approaches alone will not facilitate sustainable change. If interventions rely solely upon external controls to manage student behaviors, even if initially successful, those interventions will be unlikely to assist a student to internalize the skills necessary to self-manage those behaviors. Therefore, long-term success of any intervention requires students to learn, practice, and integrate the skills necessary for self-management and self-regulation of positive social behaviors.

Self-monitoring strategies offer an intervention modality that extends beyond teacher managed behavioral interventions. In addition, a self-monitoring approach brings together features of effective school-based programs that improve self-managed and self-regulated behaviors in a manner that meets the OSEP criteria of a tiered response model. To advance the development of a self-monitoring program, the next chapter will describe an integrated theoretical framework that merges the concepts of self-determination theory (Deci, 1975, 1995) with the social development model (Hawkins & Weis, 1985). The integrated model seeks to extend research supported practices and features of effective school-based interventions to encourage the development of self-managed and self-regulated positive social behaviors among students with elevated levels of disruptive behaviors.

CHAPTER 4

SELF-DETERMINATION: AN INTERVENTION MODEL FOR DISRUPTIVE BEHAVIORS

Many of the features of effective practices and programs discussed thus far are encompassed within self-determination theory (Deci, 1975). Researchers and educators alike are recognizing the practice of imparting skills to increase self-determination, self-management, and self-regulation can lead to improved outcomes for students with and without disabilities (Algozzine, Browder, Karvonen, Test, & Wood, 2001; Field, Martin, Miller, Ward, & Wehmeyer, 1998; Lane et al., 2011). For example, the President's Commission on Excellence in Special Education stated:

While the Commission wholeheartedly supports strong academic achievement for all students, it recognizes that academic achievement alone will not lead to successful results for students with disabilities. Students need educational supports and services to promote the acquisition of skills throughout their lives. Such skills include self-determination, self-advocacy, social skills, organizational skills, community and peer connection, communication, conflict resolution . . . (USDOE, 2002, p. 47)

This chapter describes the integration of two theories to guide the development of STARS, a self-monitoring program to be used as a selective intervention within a tiered response model. The first theory, self-determination theory (Deci, 1975, 1995), posits the development of self-managed, self-regulated, and intrinsically motivated human behavior is facilitated by contextual supports for autonomy, competency, and relatedness. The second theory, the social development model (Hawkins & Weis, 1985), unifies features of social bond, social learning, and differential association theories in a practice model to inform the

development of preventative interventions in disruptive behaviors (Brown et al., 2005; Hawkins, Smith, & Catalano, 2004; Hawkins et al., 2007; Huang et al., 2001). The basic constructs, definitions, propositions, and empirical supports for each theory will be summarized. Following the overview, the fundamentals of the two theories will be merged to inform the development of the STARS self-monitoring intervention.

Self-Determination Theory (SDT)

SDT is a person-centered theory focusing on the intersection of internal needs and contextual influences (Deci & Ryan, 1985; Wiggfield et al., 2002). The intersection drives the process of integration. Integration is an adaptive procedure whereby external values, demands, or requirements are internalized and adopted by individuals.

Concepts and definitions of SDT. SDT posits three essential needs (i.e., autonomy, competency, and relatedness) must be contextually supported for the successful adaptation or integration where an individual is intrinsically motivated to fulfill an external demand. Autonomy refers to authentic and volitional self-governance. Competency refers to feeling successful at balancing internal needs with external requirements. Relatedness refers to secure and meaningful connections to others in the context (Deci, 1975; Ryan & Deci, 1992; Wiggfield et al., 2002).

Propositions of SDT. The degree to which the three basic needs are supported by school staff shape the propensity for a student to value and comply with school-related tasks. First, autonomy or self-governance is central to SDT. To the degree a behavior is not completely autonomous—it is controlled (Deci & Ryan, 2000; Deci, Vallerand, Pelletier, & Ryan, 1991). Although the fundamental propellant that drives behavior can simultaneously be external and internal to the individual, when people act autonomously, they act with

authenticity and with a sense of interest, commitment, and ownership rather than under threat of coercion, bribery, punishment, or out of spite or rebellion.

Second, competency is perceived as the need to satisfy innate curiosities and the reason we seek challenges. From birth, we are curious as observable in a child's natural tendency to play, explore, and learn. To satisfy this drive, humans select tasks with an optimal level of difficulty aimed at achieving success. If a task is too difficult or too easy, we become overwhelmed or bored.

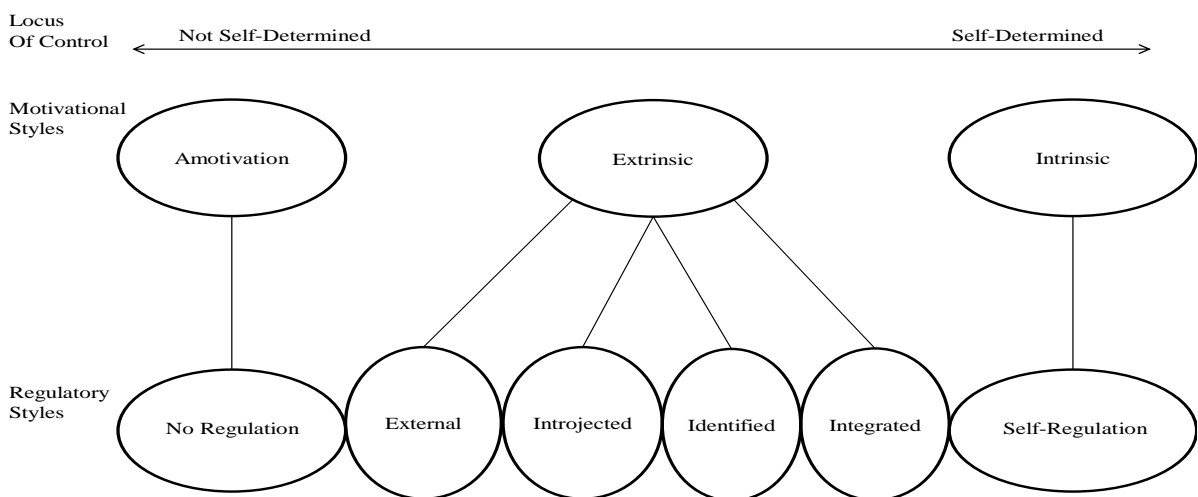
Lastly, relatedness refers to the need to feel connected to others in our surroundings (Connell & Wellborn, 1991; Ryan & Deci, 1992, 2000). Our surroundings are the medium in which we exist and experience new challenges. Meeting challenges amidst trusting relations allows individuals to test newly acquired skills without fear of embarrassment due to failure.

Though SDT refers to the three internal needs, the theory ultimately seeks to explain the role of contextual supports that shape and influence human behavior. More specifically, SDT is a theory to explain how school personnel can facilitate or impede the process of integration. The developmental process of integration or adaptation describes how disruptive students may be supported in such a way that they come to adopt and internally value the behaviors necessary for maintaining a quality learning environment. Conversely, when the context does not support student needs for autonomy, competency, and relatedness, students are more likely to feel controlled and disruptive behaviors will persist. The spectrum in Figure 3.1 is an adaptation of Deci and Ryan's (2000) self-determination continuum. On the left lies an *amotivational* style marked by *no regulation* of behavior. Moving towards the right the model has four behavioral regulatory orderings of *extrinsic motivation* (*external*, *introjected*, *identified*, and *integrated*). The extrinsic mechanisms are the intended targets of

teacher managed behavioral interventions. Lastly, there is one form of *intrinsic motivation* corresponding to behavioral *self-regulation* (Deci & Ryan, 2000). Each of the three motivational forms and their corresponding behavioral regulatory styles are responsive to contextual supports for autonomy, competency and relatedness.

Figure 3.1

Self-determination, Motivation, and Regulatory Continuum (Deci & Ryan, 2000, p. 237)



For example, individuals are *externally regulated* when we engage in a behavior to avoid punishment. A context that would support this regulatory style would be defined by limited autonomy support, untrusting relations, and limited competencies to perform tasks. *Introjected regulation* involves the performance of a task marked by compliance to obtain external rewards (deCharms, 1968; Deci & Ryan, 2000; Ryan & Deci, 1992, 2000). Next, *identified regulation* is defined by the simultaneous experience of feeling externally pressured to comply or perform a task while valuing an internal ego-oriented need for external praise, acknowledgement, or approval (Deci et al., 1991; Deci & Ryan, 2000).

Integrated regulation occurs when the value for the externally oriented task conforms, assimilates, and aligns with an individual's existing internal values; however, the task is engaged in for the purpose of completing the task with accuracy. Lastly, *self-regulation* corresponds with intrinsic motivation and relates to an individual who engages in an activity for pure interest, pleasure, and satisfaction (Deci & Ryan, 2000; Ryan & Deci, 2000).

Activities and behaviors central to schooling are not always intrinsically valued by students. Therefore, school-related activities often require the process of integration if students are to be successful and persist at school-related tasks. For example, a student may not initially value an assignment or a required behavior. However, SDT posits that a student will slowly integrate the value for completing the task or engaging in the behavior if school personnel (a) present the task or behavior in an autonomy supportive fashion, (b) provide the student with rigorous and relevant instructional supports in the skills needed to competently succeed at the task or behavior, and (c) purposefully promote the development of supportive relations and emotionally safe classrooms in which to practice the newly acquired skills.

Empirical support for SDT. Research on autonomy support, competency, and the value of relations in school settings predict a variety of outcomes across genders, between racially and ethnically diverse samples, and across many locations that include business environments (Williams, Grow, Freedman, Ryan, & Deci, 1996), health and hospice settings (Williams & Deci, 1996; Williams, Rodin, Ryan, Grolnick, & Deci, 1998), religious settings (Ryan, Rigby, & King, 1993), and sporting events (Ntoumanis & Standage, 2009). However, the majority of empirical support for SDT has been conducted within the context of school and education settings (Chirkov & Ryan, 2001; Connell, Spencer, & Aber, 1994).

With regards to the value of autonomy support, observations suggest when external rewards are used to control behavior, the rewards eventually lose their influence and begin to erode a person's sense of self-control which results in diminished post-reward competencies below that of baseline (Deci, 1975; Deci & Ryan, 2000). Studies also suggest most students do not perform at optimal levels under conditions of threat, punishment, or in direct competition with others. (Deci & Cascio, 1972). Although studies suggest extrinsic rewards do have motivating power, when rewards are presented in a controlling manner, competencies and relations are both negatively affected and only the basic requirements are met in the presence of the person who controls the reward (Deci, 1995).

With regards to school personnel and the nature of the feedback that rewards student behavior—research suggests when feedback enhances the competencies of a student to autonomously resolve an externally oriented task, children will continue to intrinsically seek more difficult tasks to accomplish. For example, in a classroom experiment repeated by several researchers, two independent groups of children solving puzzles are given different types of feedback. The first group is provided instructional feedback related to improving skill competencies and strategies whereas the second group was provided with ambivalent feedback or praise related to the outcome. Repeatedly, the first group persisted at repeating the puzzle solving tasks and selected more difficult tasks while the second group gave in more easily and preferred the easier tasks over harder ones (Deci & Cascio, 1972; Mueller & Dweck, 1998). These study results suggest that the feedback process should be both constructive and formative to improve performance outcomes.

School-based research has shown classrooms and schools that promote student autonomy have increased levels of student engagement, intrinsically motivated learners,

increased satisfaction, and improved student-teacher relations (Connell et al., 1994; Deci et al., 1981). Healthy student-teacher relations are a powerful predictor of positive classroom behavior. Specifically, observations suggest the degree of emotional support and the style of teacher feedback significantly predict both student behavioral and academic outcomes (Wentzel, 1997, 2002). Conversely, students who have poor relations with teachers tend to have diminished interpersonal and social problem solving skills (Wentzel, 1997; Wentzel, Looney, & Fillesetti, 2007). Lastly, interventions that train school personnel to use strategies that improve autonomy support, school relations, and academic and social competencies have been associated with improved school attendance, academic performance, and social behavior in several studies conducted in large urban school districts (Connell et al., 2008).

In summary, the critical contributions of SDT to the integrated STARS model include contextual support for the needs of autonomy, relatedness, and competencies. The supports are theorized to facilitate the growth of positive social behaviors that are self-managed and self-regulated. However, the social development model provides important insight into the process of structuring contextual supports that encourage self-managed and self-regulated reasons for disruptive students to adopt positive behaviors.

The Social Development Model (SDM)

The SDM is a framework that guides practice activities to alter the etiology and persistence of disruptive behaviors (Catalano & Hawkins, 1996; Hawkins & Weis, 1985). According to the SDM, as children age they encounter opportunities to engage in activities with other social units. The values associated with those units shape an individual's repertoire of behaviors. More specific, a reciprocal feedback processes between skills, opportunities, and reinforcements shape social bonds with others. The bonds form regardless

of the nature of the units—that is, if units are deviant then disruptive behaviors are valued and if units are positive then positive behaviors are valued.

Concepts and definitions of the SDM. SDM integrates social bond, social learning, and differential association theories. Social bond theory explains the role of attachment to socializing units in the development of behaviors (Brown et al., 2005; Hirchi, 1969; Shoemaker, 2005). Social learning theory asserts behaviors are shaped via social reinforcers (Akers, 1973; Bandura, 1977; Hawkins & Weis, 1985). Differential association theory proposes disruptive and positive social behaviors have similar pathways (Shoemaker, 2005).

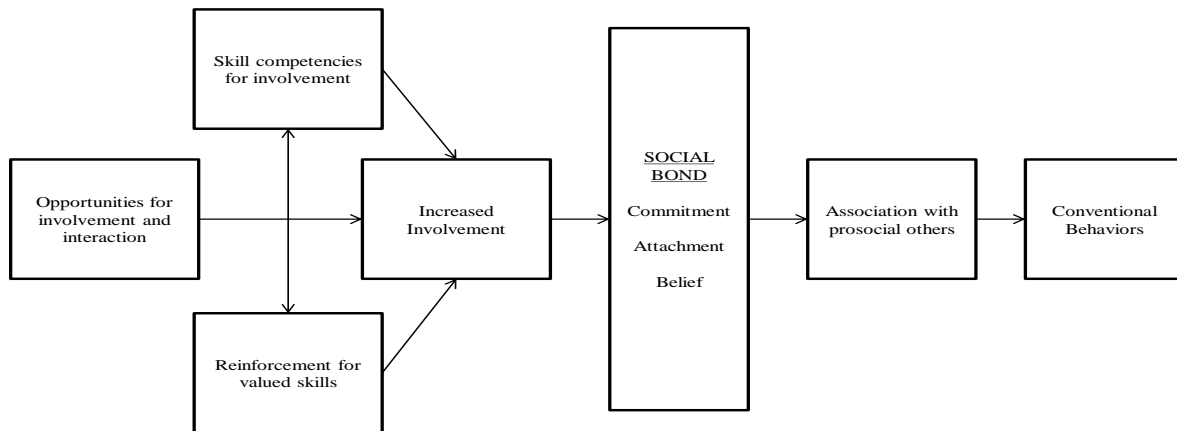
Propositions of the SDM. The empirically supported elements of the middle range theories integrated into the SDM (social control, social learning, and differential association theories) contribute four main propositions. First, a person requires opportunities to become involved with others. Second, a person requires the skills to engage in parallel activities with others. Third, behaviors are rewarded or acknowledged by the social unit when those behaviors align with the values of that unit. Finally, bonds result from social acceptance and reinforcements gained from pairing opportunities with skills that embody behaviors valued by the social unit (Hawkins & Weis, 1985).

Figure 3.2 highlights the three central processes (i.e., opportunities for involvement, skills, and reinforcements for valued skills) that lead to increased involvement and attachment with others in school units. In the SDM, opportunities for involvement are necessary but not sufficient for a bond with teachers and prosocial peers to develop. Rather, the alignment of a constellation of factors will include the youth possessing the skills, having the opportunities to exhibit those skills, and receiving relevant social reinforcements. The process shapes behaviors as the feedback loop repeats itself. Over time, an individual comes

to endorse and internalize the values of the social group which leads to the development of a bond or attachment to the unit (Hawkins & Weis, 1985).

Figure 3.2

The Social Development Model (Hawkins & Weis, 1985, p. 79)



SDM, through differential association theory, assumes that both positive and negative behaviors develop from similar processes (Hawkins & Weis, 1985). However, the SDM posits that targeting individuals with varying levels of risk through multiple supports does reduce the overall risk for everyone in those contexts (Choi et al, 2005). Similar to tiered response models, the SDM suggests that combining universal and selective supports to meet the competencies and various degrees of need can lower risk and improve outcomes for all students.

Empirical support for the SDM. Researchers with the Seattle Social Development Project (SSDP) followed a group of children living in low-income and violent prone neighborhoods from 1985 to 1993. Measuring the levels of opportunity for interaction and bonding with prosocial and delinquent units, researchers found children who endorsed

prosocial behaviors were more likely to bond with prosocial units whereas children who endorsed antisocial behaviors were more likely to bond with delinquent units (Herrenkohl et al., 2001).

Longitudinal studies of the SDM as a framework for intervention programs have shown the underlying principles of the model are successful at reducing disruptive school behaviors (Fleming et al., 2008; Hawkins, Guo, Hill, Battin-Pearson, & Abbott, 2001). Fleming and colleagues (2008) designed program activities to increase social opportunities and prosocial skill competencies for 776 sixth through ninth graders. Results from the study agreed with prior findings that both skills and opportunities were important for facilitating student involvement. Furthermore, involvement in prosocial activities in early developmental stages reduced disruptive behaviors at later developmental periods (Fleming et al., 2008). Counterfactually, students reporting low levels of early involvement in structured prosocial activities reported greater disruptive behaviors at later developmental periods.

In summary, the critical contributions of the SDM to the integrated STARS model include the purposeful development of relevant skills through rigorous instruction, ongoing opportunities to practice those skills, and meeting the intersection of skills and opportunities with socially supportive feedback when the skills are displayed. Although matching skills and structured opportunities are features of many interventions, intervention studies based upon the SDM also suggest early prevention that combines a range of supports to address diverse needs can reduce risk and improve outcomes for all students.

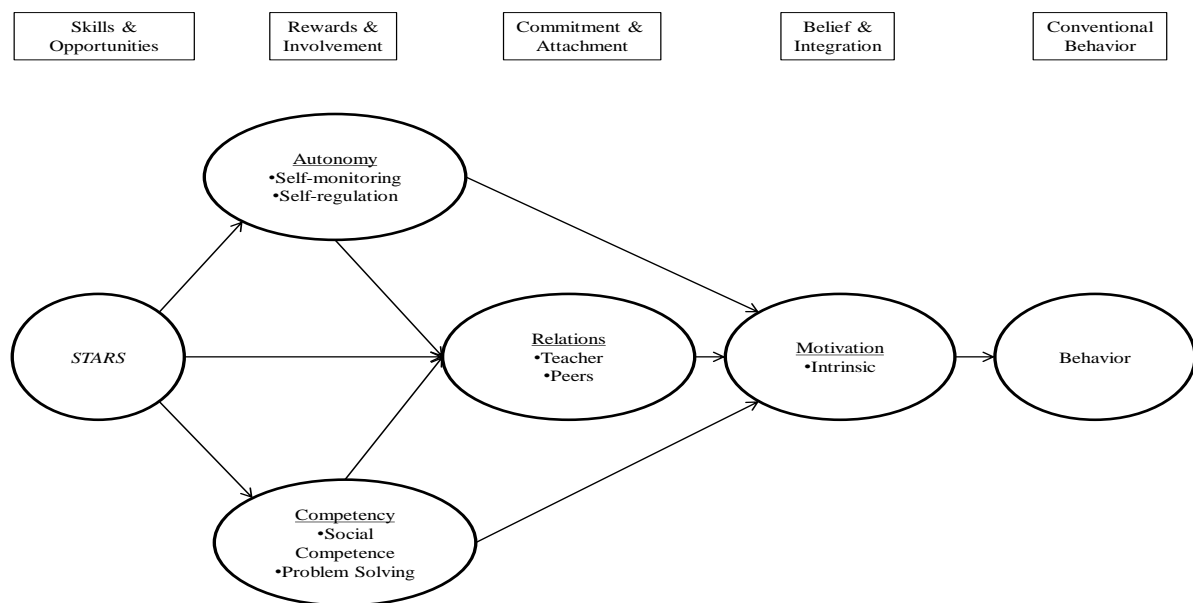
STARS: Integrated Model to Inform the Development of a Self-monitoring Program

Figure 3.3 is an intervention model integrating the concepts of SDT with the processes of the SDM to guide the development of a self-monitoring intervention. For

students to engage in self-monitoring, they need training in social competence (i.e., social and self-awareness, communication skills, taking another's perspective), self-regulation strategies (i.e., self-awareness, self-management skills) and problem solving skills (i.e., identifying and evaluating problems and solutions, setting goals, engaging in goal directed behavior, monitoring progress, assessing discrepancies between goals and performance; Lane et al., 2011). To boost student acquisition of these skills, prior research suggests the skills should be sequenced using an advanced organizer and SAFE instructional procedures (Durlak et al., 2011; Lane et al., 2011; Langland et al., 1998).

Figure 3.3

STARS Intervention Model



Once students are provided with skills to improve social competence, self-regulation, and problem solving, SDM concepts integrated within the STARS model suggest those skills need to be paired with opportunities. SDT suggests these opportunities should be autonomy

supporting. The STARS model posits that self-monitoring is an autonomy supportive way to practice the skills. Self-monitoring opportunities incorporated throughout the course of the school day will also enhance student procurement of the skills (Barrish, et al., 1969).

When students practice the skills during self-monitoring opportunities, the STARS model integrates a formative feedback process to improve skill acquisition. Formative feedback is a socially supportive and rewarding interaction between the student and school personnel to reinforce and guide the student's performance. Although reinforcements are central features of the SDM, the SDM does not clearly delineate the nature of the reinforcements. The nature of the reinforcements, as suggested by SDT, should be positive, autonomy supportive, and competency enhancing. School personnel relying on external rewards or punishments to facilitate or control student behaviors risk shifting the focus from process (improving skills for self-management) to outcomes (attaining the reward or not getting caught) which encourage students to take shortcuts. When reinforcements are used to control behavior, autonomy is diminished and compliance results only in the presence of the contingencies. However, if non-controlling supports and rewards serve to improve skills, students can enhance their abilities to self-monitor, self-manage, and self-regulate.

When students become more skilled at managing their behaviors, the STARS model suggests relations with peers and teachers will improve as students display greater social competencies and self-control. Improved relations act as a positive social reinforcer that enhances student capacities for self-monitoring. In addition, a formative feedback process between students and school staff that includes students comparing their own self-monitoring data with that of their teacher data will provide students with opportunities to practice interpersonal skills (i.e., perspective taking, social and self-awareness, problem solving, and

communication). The opportunities also provide school personnel a chance to support, confirm, and provide the student with clues about where improvements can be made. In short, the supportive and formative feedback serves two reinforcing processes: to sharpen student competencies and improve relations and bonds with school personnel.

In summary, with the necessary competencies, autonomy infused opportunities, and formative feedback from emotionally supportive adults, the STARS model posits a student can integrate expected school behaviors into their existing repertoire of self-managed and self-regulated behaviors. When students possess relevant skills, autonomous opportunities, and supports to improve outcomes for valued school behaviors, those behaviors are more likely to be managed by the student instead of the teacher. The question for school personnel is not “how do I get my students to behave,” but rather, “what skills should I teach, how do I provide autonomy supportive opportunities to present the skills, and how do I engage my students in a supportive and formative feedback process once the skills are presented?”

To improve the ability of school personnel to answer the above questions, the next chapter operationalizes the concepts of the integrated STARS model within a self-monitoring intervention. The STARS self-monitoring strategy organizes (a) direct instruction in the skills to self-manage, (b) autonomy supportive opportunities to practice the skills through self-monitoring of classroom behaviors, and (c) a formative feedback process to enhance competencies amidst supportive relations. The chapter will describe the methods used to test the effects of STARS on disruptive student behaviors using a randomized control design.

CHAPTER 5

RESEARCH METHODS

The dissertation study used a two-group randomized design to examine the effects of STARS, a selective self-monitoring intervention. The study sample included 108 students in 42 classrooms and seven public schools in an urban setting of a Mid-Atlantic State. A prescreen was used to identify the 20% of students in each fourth and fifth grade class with elevated levels of disruptive behavior. Students with consent were randomly assigned to either STARS or a control group. Group differences were examined using changes between pretest and posttest measures following program allocation for students in the STARS group.

Sample Size and Power

Power refers to the sample size needed for a study to reject the null hypothesis that no association exists between a dependent and independent variable (Shadish, Cook, & Campbell, 2002). To determine adequate power, *Optimal Design 2.01* (OD; Raudenbush & Liu, 2011) was used to estimate the number of classroom clusters required to detect effects.

With OD, power was calculated using the cluster randomized trial with person level outcomes and treatment at level 2. The intraclass correlation (ρ) was estimated at .01 and .05 and .15 based upon recommended estimates from prior behavioral research (Carvajal, Baumler, Harrist, & Parcel, 2001). The average cluster size (n) was estimated to be 20%, or 3 - 4 students, in each fourth and fifth¹ grade classroom. Effect size (δ) estimates were based

¹ Average classroom sizes included 18-20 students.

upon Cohen's *d* metric ranging from moderate (0.5) to large (0.8; Cohen, 1988). Moderate and large effect sizes were assumed based upon data from a pilot study of STARS (ES = 0.52; Thompson & Webber, 2010) and prior meta-analyses of self-monitoring interventions (ES = 0.5 – 4.11; Briesch & Chaffouleas, 2009; Fantuzzo et al., 1988). Alpha (α) was set at .1 and .05 for a two-tailed test. Using the above parameters, OD estimated 20 clusters in both intervention and control conditions were sufficient to achieve adequate power.

Sampling Procedures

Sample recruitment, inclusion and consent procedures for this study were approved by the Institutional Review Boards of the participating school districts and the University of North Carolina at Chapel Hill. Study sample recruitment, inclusion, and consent procedures were applied at the school, classroom, and student levels.

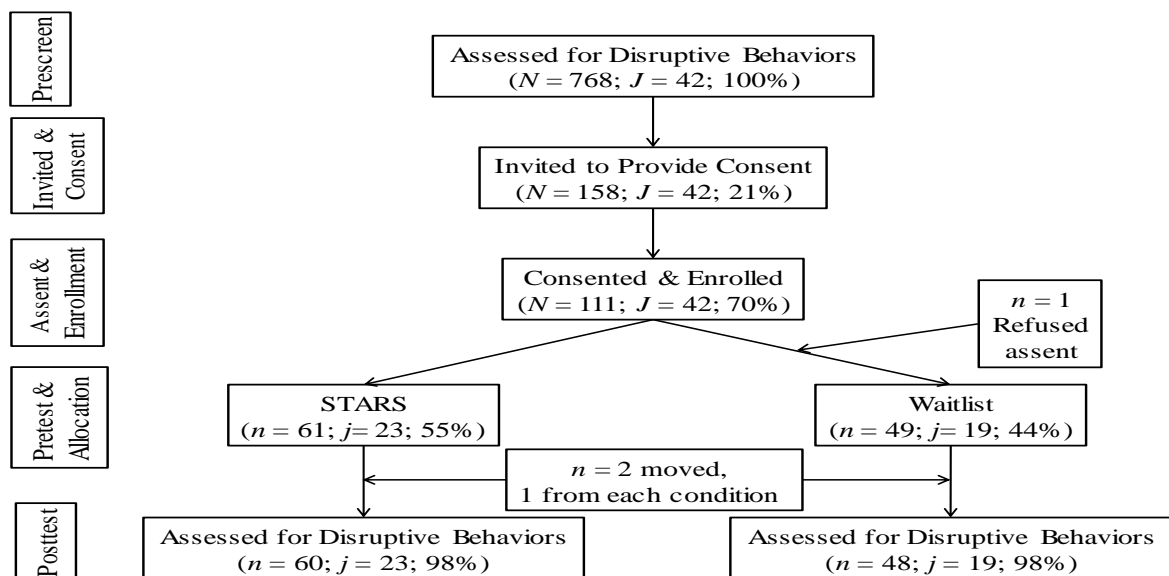
School level. Schools were recruited from a list of ten elementary schools nominated by the district central office. To be included, a school needed to (a) be a primary school, (b) have a site-based school counselor (hereafter referred to as a “Mission Coordinator”), and (c) have established universal prevention practices in place. Principals from six of the ten schools agreed to participate in the study. In addition, a seventh independent charter school agreed to participate.

All seven principals provided written consent to participate in the study and signed a letter stating that a selective behavior support program was a priority for the school. Next, Mission Coordinators consented to be intervention agents. Mission Coordinators were school counselors with master's level degrees and an average of 12 years of experience providing behavior interventions in school settings. Acting as intervention agents, Mission Coordinators approached all fourth and fifth grade teachers in their school buildings.

Classroom level. Study inclusion criteria limited participation to consenting fourth and fifth grade teachers who agreed to complete all study procedures and refrain from disseminating information regarding the intervention to other teachers over the course of the study. Teachers were recruited by site-based Mission Coordinators. Forty-three teachers initially agreed to participate; however, one classroom was dropped because prescreen measures were not completed in a timely manner. Teachers were given \$100 stipends for completing study measures and complying with program activities.

Figure 4.1

Participant Flow Chart



Note. Participant percentages reported at each stage are calculated using the number of participants in the prior stage. $N(n)$ = number of students; $J(j)$ = number of classrooms.

Student level. At the student level, teachers completed a prescreening instrument to assess the classroom behavior of all fourth and fifth grade students. Similar to prior school-based studies, students were invited to participate in the study if their prescreen score was lower than a .60 or if their scores placed them in the 20% of students in the classroom with

the highest levels of disruptive behavior (Metropolitan Area Child Study Research Group, 2007).

For all of the selected students, parent permission letters were sent home. Mission Coordinators made one follow-up phone call to parents if the letters were not returned after one week. Students with parent permission were then requested to provide verbal assent. Students were not provided with incentives for participating. Figure 4.1 displays the flow of the final 108 students who provided data for the analytic sample through prescreen, consent, assent and enrollment, pretest, allocation, and posttest study phases.

Research Design

A two-group, pre and post, experimental design with randomization at the classroom level was used in the study. Table 4.1 shows the study design and timeline. Following universal prescreening completed by all consenting fourth and fifth grade teachers, 20% of disruptive students were identified and invited to participate. After securing consent from parents, students were randomized (R) at the classroom level into either Groups 1 or 2.

Randomization at the classroom level was imperative to prevent within-classroom contamination and compensatory rivalry between two or more students in different conditions (Shadish et al., 2006). Following randomization, pretest measures (O_1) were completed by all students and teachers in Groups 1 and 2. After pretest measures were collected, students in classrooms randomized to Group 1 received access to STARS (X) while students in Group 2 received routine services (RS). After the allocation of the intervention, posttest measures (O_2) were completed by all students and teachers in Groups 1 and 2. At the close of the study, all students in Group 2 were provided with access to the intervention.

Table 4.1

Study Design and Timeline

	Sept 16	Sept 30	Oct 7	Oct 10-Dec 9	Dec 16
Group 1	Prescreen	R	O ₁	X	O ₂
Group 2	Prescreen	R	O ₁	RS	O ₂

Notes: R = Randomized by classroom; O₁ = Pretest; X = STARS Student Training followed by 4 weeks of student self-monitoring behavior and teacher monitoring of student behavior; RS = Routine Services; O₂ = Posttest

Intervention Procedures

Mission Coordinator training. Mission Coordinators were provided with a STARS treatment manual. The STARS manual detailed each step of the intervention and increased the likelihood of uniform program allocation across multiple sites. The manual included a description of program theory, lesson plans that followed SAFE instructional procedures (Durlak et al., 2011), a poster of the STARS problem solving model, program forms necessary for student training, materials for all student exercises, forms for teacher and student monitoring of student behavioral goals, a spreadsheet database program to graph the monitoring data, and checklists to monitor implementation fidelity.

In addition to the treatment manual, all site-based Mission Coordinators participated in a one-hour training. The training provided detailed steps of the STARS intervention and opportunities to address specific issues affecting program allocation. Each Mission Coordinator was given a \$100 stipend and all intervention materials (i.e., intervention manual, behavior databases) to manage the intervention and study activities. Weekly site visits provided opportunities to address implementation issues over the course of the study.

Student training. Following the training of Mission Coordinators, prescreening procedures, randomization of classrooms (See Table 4.1), and consent procedures, STARS

students participated in a two-stage intervention. *Stage I* consisted of two weeks of small group training with Mission Coordinators. Mission Coordinators used a checklist to track the student attendance and the length of each session. If a student missed a lesson, Mission Coordinators met with the student at the earliest time possible to review the lesson content.

The STARS manual included nine scripted lessons. The scripted lessons provided similar student training experiences in the requisite skills. Each lesson was designed to sequence student training in explicitly define social competencies using active learning modalities. A total of nine lessons exposed students to the following skills

- *autonomously* identifying and defining problems, generating and evaluating alternative solutions, writing observable behavioral goals to implement a solution, recording data to monitor goal progress, and using data to evaluate goal progress;
- improving school *relations* through social awareness, perspective taking, and communication strategies (giving and receiving constructive feedback); and
- *competently* recognizing and managing internal responses to external stressors, identifying discrepancies, and reframing failure as a natural part of learning.

Following the Stage I training, students proceeded to *Stage II* where each student self-monitored his or her own behavioral goal created during Stage I. During Stage II, Mission Coordinators met STARS students each morning, encouraged students to have a “good day,” provided a verbal prompt to each student regarding his or her behavioral goal, and marked the student’s name on a checklist. Mission Coordinators then handed each STARS student two interval cards. For an example of the STARS goal card, see appendix A.

Both interval cards had the same goal created by that student during the Stage I training phase. Each goal was observable, measurable, and related to a disruptive behavior

that occurred in the context of the classroom. One goal card was used by the student, the other by the teacher. Using the cards, students and teachers rated goal performance once every hour for six hourly intervals. Goal performance was rated using a “yes” or “no” response option. To record goal performance, students and teachers selected either a “yes” or a “no” depending on whether the student displayed behaviors that aligned with the goal listed on the card for that time interval. Students and teachers were instructed to mark the card as close to the interval time breaks as possible.

Mission Coordinators collected both student and teacher interval cards at the end of each day. Mission Coordinators entered the data from both cards (“yes” responses were coded as 1, “no” responses were coded as 0) into a preformatted spreadsheet program on a CD that accompanied the STARS program manual. The spreadsheet was preformatted to compute daily percentages and graph the teacher and student data. The two graphs and percentages (i.e., student and teacher) reflected the student’s average daily goal performance.

At the end of each week for four consecutive weeks, the Mission Coordinator would meet with STARS students to review daily percentages and graphs. Using the percentages and graphs, the student and Mission Coordinator would compare student and teacher data. STARS program forms were used to compare the two sets of data, identify specific areas of difference or discrepancy between the accounts, and outline steps for each student to use the STARS problem solving model (printed on a poster) to reformulate goals and reduce the difference between the two perspectives. The Stage II student and teacher monitoring and assessment procedures were repeated each week for four continuous weeks.

At each school site, routine services were provided to STARS and control students. For example, all students had access to universal prevention supports. Universal prevention

strategies engaged in by all schools in the study included (a) school-wide rules posted in all areas, (b) daily instruction in skills necessary to engage in expected behaviors, (c) school-wide systems to acknowledge positive behavior, and (d) staff use of school-wide data to assess all universal efforts. In addition, four schools provided universal social-cognitive skills training to all students using *Second Step* (Cooke et al., 2007) and three schools employed the universal program called *Playworks* (<http://www.playworks.org/>), a directive playground program. Regarding selective supports for control students, Mission Coordinators reported control students were referred to the office, were provided with counseling, were allowed to “cool off” if upset, and were provided with teacher managed interventions (i.e., teacher-only behavior monitoring). In addition, all students were routinely exposed to social praise and tangible rewards and other routine selective strategies to support and encourage appropriate social behaviors.

Data Collection Procedures

As shown in table 4.1 above, all data were collected between the months of September and December, 2011. As part of the program evaluation, data collection procedures requested teachers to complete a prescreen for each student after the third week of school. After the prescreen scores were collected, all classrooms were randomized to the STARS or control conditions. Following randomization, three weeks passed before teachers and students completed pretest measures. Posttest measures were completed after the intervention allocation, nine weeks following the pretest.

To protect student identities, anonymous data collection procedures were followed. The study investigator worked with Mission Coordinators at each school to create a master list. The master list included unique identification (ID) numbers matched to student names.

Mission Coordinators maintained the master list and used the list to match the ID numbers on questionnaires prepared by the study investigator.

Using the de-identified questionnaires, Mission Coordinators directly supervised STARS and control students as they completed paper and pencil surveys. Teacher surveys were completed using an online format. Teachers were provided with student names and ID numbers by the Mission Coordinators. Teachers entered the student ID number into the online survey and responded to questions pertaining to the classroom behavior of that student. The de-identified student survey data were then merged with the teacher online survey data using the student ID numbers as the common identifier.

Measures

Teachers provided data on their own demographics (i.e., sex, grade level, race/ethnicity) as well as those of their students (i.e., sex, race/ethnicity, special education status, primary eligibility, year and month born). Teachers also completed measures to assess student disruptive behavior, social competency, relatedness with the student, perceived student autonomy, and perceived student motivation. Teachers randomized to the STARS condition completed feasibility and social acceptability questions at posttest.

Students completed surveys to assess their perceptions of autonomy support at school and relatedness with their classroom teacher and peers. Measures assessing the feasibility and social acceptability of the intervention were collected from STARS students at posttest. Fidelity was assessed using program forms, checklists, site-visits, and exit interviews with Mission Coordinators from each of the seven sites.

Disruptive behavior. Disruptive behavior was assessed using 15 items taken from the Elementary School Success Profile (ESSP; Webber, Rizo, & Bowen, 2010). The 15 item

scale ($\alpha = .91 - .95$) was used at pretest to identify the 20% of students in each classroom who displayed the highest levels of disruptive behaviors. The behavior scale included items to assess student propensities to attend to tasks, work well alone or with others, manage responses to adverse events, think before acting, be aggressive with others, follow instructions, and comply with classroom directives. In addition to the prescreen, teachers completed the items on the behavior scale at pre and posttest for all students in the study.

At pre and posttest only, disruptive behavior was assessed using the authority acceptance and cognitive concentration scales from the Carolina Child Checklist - Teacher Form (CCC-TF; MacGowen, Nash, & Fraser, 2002). The authority acceptance scale included 10 items ($\alpha = .93$) measuring how often a student lied, teased others, broke rules or things, was stubborn or yelled at others. The cognitive concentration scale included 12 items ($\alpha = .84$) measuring student on-task behavior, work ethic and completion, self-reliance, and ability to concentrate. Items used to assess disruptive behavior, authority acceptance and cognitive concentration were measured on a 6-point Likert scale ranging from *never* (0) to *always* (5).

Autonomy. Student perceptions of teacher autonomy support were assessed using The Learning Climate Questionnaire (LCQ; Deci et al., 1991). The LCQ included 10 items ($\alpha = .95$) measuring student perceptions of whether a teacher provided choices, was open to student opinions, and whether students felt teachers talked to and interacted with them in ways that communicated respect and support.

Teacher perceptions of the ability of students to manage emotions, calm down when excited, and control their temper was assessed using the Self-Control subscale from the ESSP (3 items; $\alpha = .92$; Bowen, 2010). Participating students and teachers assessed autonomy at pre and posttest using a 6-point Likert scale ranging from *never* (0) to *always* (5).

Relatedness. To assess student perceptions of student-teacher relations, students provided responses to the ESSP Teachers Who Care subscale (Bowen, 2010). The scale includes 5 items ($\alpha = .72$) measuring student perceptions of whether a teacher listened, praised, provided help, and got along well with the student. Student perceptions of peer relations were measured using the Fun Place to be With Other Children subscale from the ESSP (Bowen, 2010). The scale included 4 items ($\alpha = .84$) that assessed whether students felt they had friends to play with, talk to, and eat lunch with at school. Participating students assessed their relations with their teacher and peers at pre and posttest using a 4-point Likert scale ranging from *never* (0) to *always* (3).

Teacher perceptions of student-teacher relations were measured at pre and posttest using the Teacher-Student Relationship Questionnaire (TSRQ; Hughes, Luo & Loyd, 2008). The TSRQ included 12 items ($\alpha = .94$) assessing teacher perceptions of whether a student openly talks with, is affectionate towards, seeks comfort from, and is trusting of his or her classroom teacher.

Teacher perceptions of student and peer relations were measured using two items ($\alpha = .89$) from the CCC-TF that assessed how much the child was liked by his or her peers (MacGowen et al., 2002). Teacher perceptions of the quality of their relations with student participants and between student participants and agemates were collected at pre and posttest using a 6-point Likert scale ranging from *never* (0) to *always* (5).

Social competence. Student social competence was assessed by teachers using the Social Behavior at School subscales from the ESSP (11 items; $\alpha = .89$; Webber et al., 2010). The scale is a measure of the capacity for a student to play well others, solve problems peacefully, and manage emotions despite adverse events. Teacher perceptions on the social

competency of student participants were measured at pre and posttest using a 6-point Likert scale ranging from *never* (0) to *always* (5).

Motivation. To assess student motivation, the Children's Motivation Scale (CMS) was completed by teachers (Gerring, 1996). The CMS is a 16 item ($\alpha = .91$) scale that was used to assess whether a student was a self-starter, required prompts to complete projects, made plans with others, lacked energy, put effort into school related activities, was curious, approached activities with intensity, or was interested in solving problems. Teacher perceptions on the motivation of student participants were collected at pre and posttest using a 6-point Likert scale ranging from *never* (0) to *always* (5).

Feasibility and social acceptability. Feasibility and social acceptability were assessed using a posttest survey called the STARS Intervention Rating Scale-Teacher (SIRS-T). Adapted from the Primary Intervention Rating Scale ($\alpha = .97$; Lane et al., 2009), questions were changed to reflect activities directly associated with STARS (i.e., replacing "the activity" with "STARS"). Teachers randomized to the STARS condition completed the SIRS-T at posttest to assess whether they felt the intervention: was appropriate for students, aligned with existing universal efforts, helped improve student behavior, would be recommended to other teachers, or resulted in negative side-effects for students.

Students randomized to the STARS condition responded to the STARS Intervention Rating Scale-Student (SIRS-S). STARS students, at posttest, were asked to assess whether they felt STARS was fun, whether participating in STARS created problems for them with their peers, whether they felt STARS helped them better understand how to set goals, and whether goal monitoring helped them do better in school. The student and teacher versions of the SIRS-S were rated using a 4-point Likert scale ranging from *never* (1) to *always* (4).

Fidelity. Fidelity was assessed in several ways. To begin, STARS students completed a 9-item STARS Intervention Checklist (SIC). Adapted from the Self-Management Intervention Checklist (Fantuzzo et al., 1998), all items referring to the use of tangible rewards were excluded from the SIC. In addition, item terminology was changed so that the SIC explicitly referred to STARS program activities. The SIC asked students whether they were directly involved in identifying problems, selecting and writing goals, monitoring goals, graphing data, comparing data, and rewriting goals. All items on the SIC were measured on a 5-point Likert scale ranging from *never* (1) to *always* (5).

Fidelity was also assessed through program forms and activity checklists. Mission Coordinators marked program forms to record (a) the number of skill training sessions attended by each student, (b) the number of days students self-monitored, and (c) the number of data review meetings attended by students. Fidelity was also assessed from program forms produced at various stages of the intervention (e.g., lesson activity forms, daily student and teacher monitoring forms, weekly meeting guides). In addition to checklists, fidelity was assessed using site-visits conducted regularly over the course of the study and a meeting with the principal and Mission Coordinator at each school site at the close of the study.

Coding of Variables

A dummy variable approach was used to code treatment assignment (0 = CONTROL, 1 = STARS) and all covariates. Student covariates included student sex (0 = MALE, 1 = FEMALE) and free and reduced lunch status (0 = NO, 1 = FRL). Because a majority of students in the study are African American or European American, student race/ethnicity was coded as one variable (0 = OTHER, 1 = AFAM), along with Educational disability status (0 = REG, 1 = SPED). Student age was coded as the number of months elapsed since birth.

Outcomes were assessed using student and teacher questionnaire items. All negatively worded questionnaire items were reverse coded so higher scores indicated positive social behavior (e.g., for a question about fighting = 5 designated a child *never* fights). After questionnaire items were recoded, reliabilities were calculated for ten, mean-centered composite variables. Composite variables included behavior (BEHAV), authority acceptance (AUTH), cognitive concentration (COGCON), autonomy (AUTO), social competence (SOCOM), student and teacher relations (student [RELs] and teacher perspectives [RELt]), peer relations (student [FRIENDs] and teacher perspectives [LIKEt]), and motivation (MOTIV).

Study Hypotheses

The research was guided by several hypotheses. Related to feedback on the intervention itself, it was hypothesized that teachers randomized to the STARS condition would report self-monitoring as a feasible selective support strategy to be used within a tiered response model. Secondly, it was hypothesized that students randomized to the STARS program would report socially acceptable responses regarding the intervention.

Related to behavioral outcomes, and controlling for pretest performance and student characteristics (i.e., sex, race, free and reduced lunch), it was hypothesized that students in the STARS condition, relative to students in the control conditions, would have higher scores on posttest teacher measures of classroom behavior, social competency, school relations (i.e., student-teacher and peer relations), and higher scores of perceived motivation for engaging in classroom activities.

It was also hypothesized that, controlling for pretest performance and relevant student characteristics, STARS students, compared to control students, would report higher posttest

scores on measures of autonomy and school relations (i.e., student-teacher and peer relations). It was also hypothesized that outcomes would not vary as a function of student characteristics (i.e., race/ethnicity, gender, age, regular or special education status, or free and reduced lunch status). Lastly, it was hypothesized the direct relationship between STARS and teacher reports of student motivation and classroom behavior would be mediated (i.e., partially or fully) by teacher reported levels of student autonomy, relatedness (i.e., student-teacher relations), and social competency.

Analysis Strategy

Analyzing selection bias. Selection bias and group equivalence were examined using SPSS 18.0 for Windows. Using the treatment variable as the grouping assignment, differences between group assignment and demographic variables were assessed using contingency tables and χ^2 tests. A series of *t* tests were used to examine whether any pretest differences existed between treatment and control groups on all outcome measures. Tests of homogeneity of variances between groups on pretest means were assessed using Levene's Statistic. When equal variances were assumed, the Least Significant Difference test was assessed at $\alpha = .05$.

Analyzing intervention feasibility and acceptability. To examine feasibility and acceptability of the STARS intervention, the average responses to the SIRS of student and teachers randomized to the STARS intervention were calculated. Response categories were collapsed to summarize teacher and student reactions as infeasible and unacceptable (i.e., *never* and *sometimes*) or feasible and acceptable (i.e., *often* and *always*).

Analyzing main effects. Two considerations condition the analysis of main effects. First, using raw difference scores on posttest outcomes, by themselves, are more likely to

inflate standard errors, expand confidence intervals, and increase the likelihood of statistically significance findings (Curran & Muthen, 1999; Wears, 2001). To correct for this, pretest performance scores can be used as predictors in the models to reduce unexplained variance on outcomes (Curran & Muthen, 1999). Therefore, multiple regression models were estimated using pretest performance scores as predictors of posttest outcomes.

Second, due to the clustered nature of the data (i.e., students in classrooms and classrooms in schools), within-cluster standard errors are highly correlated which leads to broad confidence intervals and a likelihood of significant t statistics (Curran & Muthen, 1999). Several methods, including robust regression, exist to correct for clustered data. A robust regression command in Stata 10.0, or more commonly referred to as a “sandwich estimator” or a Huber-White correction, was used to apply penalties in the calculation of standard errors to correct for the clustering of data (Stata, 2011).

Robust regression procedures were used to estimate program effects on ten outcome variables assessing changes in disruptive behavior (BEHAV), authority acceptance (AUTH), and cognitive concentration scales (COGCON). Other outcomes included changes on the autonomy support (AUTO) and social competence (SOCOM). Relationship outcome variables were used to assess changes in student and teacher relations according to teacher perceptions (RELt) and student perceptions (RELs). Outcomes related to student peer relations were assessed by both teachers (LIKEt) and by students (FRIENDs). Lastly, changes in student motivation were assessed using teacher rated outcomes (MOTIV).

Figure 4.2

Basic Robust Regression Equation

$$Y_2 = b_0 + b_1(Y_1) + b_2(tx) + b_3(x_3) \dots + e_i$$

In Figure 4.2, Y_2 is the predicted outcome score, b_0 is the intercept, $b_1(Y_1)$ is the pretest score on the outcome variable of interest, $b_2(tx)$ is the treatment variable (0 = CONTROL, 1 = STARS), $b_3(x_3) \dots$ includes the relevant student level covariates included in all analyses (i.e., RACE, SEX, FRL, AGE, SPED), and e_i is the robust standard error of the estimate.

In addition, 95% confidence intervals (CI) were calculated to provide an accurate estimate that the “true” predicted value lays between the upper and lower limits of the interval (Stata, 2011). The 95% CIs were calculated by using the formula in Figure 4.3.

Figure 4.3.

Basic CI Equation

$$b \pm (Z_{\alpha/2}) * (e)$$

In Figure 4.3, b is the predictor coefficient. The $Z_{\alpha/2}$ is the transformation of the intercept score (Z_a) into a z-score on a standardized normal distribution. The z-score is divided in half before being added and subtracted (\pm) from the predicted coefficient to create CI estimates on both sides of the coefficient (Stata, 2011). If the CI includes zero, it is equivalent to a probability statistic where we reject the null hypothesis that the effect of the coefficient is zero. The advantage of presenting a CI is that it provides a range in which the “true” parameter may lie (Stata, 2011).

Effect sizes were estimated using Cohen’s d statistic for all outcomes significantly related to treatment assignment (Cohen, 1988). Effect size estimates are comparable between programs and provide a meaningful interpretation of the strength of a program. In Figure 4.4, Cohen’s d is calculated by finding the difference in posttest mean changes for the experimental (M_e) and control groups (M_c), divided by the pooled standard deviation. The

pooled standard deviation is calculated by taking the square root of the squared standard deviation of the experimental group (SD_e^2) plus the squared standard deviation of the control group (SD_c^2 ; Cohen, 1988).

Figure 4.4

Cohen's d Effect Size Statistic

$$d = (M_e - M_c) / \sqrt{(SD_e^2 + SD_c^2) / 2}$$

Analyzing moderation effects. Moderation effects were analyzed by adding product terms to the models testing main effects. Consistent with the analysis of main effects, product terms were tested one at a time with all predictor variables used in main effect models. Product terms were removed if they were not significant. Product terms were generated between all student level predictors (i.e., RACE, SEX, FRL, AGE, SPED) and the variable representing treatment (i.e., TX). The product terms resulted in five interaction terms (i.e., TX* RACE, TX*SEX, TX*FRL, TX*AGE, TX*SPED).

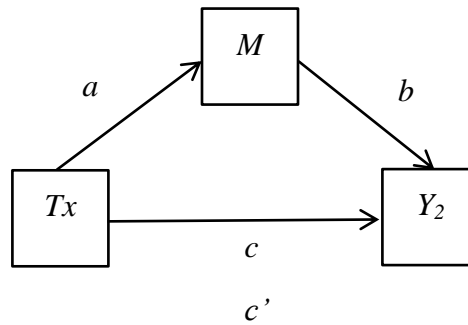
Analyzing mediation effects. Consistent with main and moderation effects models, mediation models were estimated with all relevant covariates. Mediation effects were tested following the unstandardized product coefficients method (Barron & Kenny, 1986; McKinnon, Lockwood, Hoffman, West, & Sheets, 2002). The significance of the indirect effect of STARS on behavior and motivation outcomes as mediated by autonomy, competency, and relatedness were assessed using the Sobel test (1982).

The unstandardized product coefficient method (Barron & Kenny, 1986; McKinnon et al., 2002), shown in Figure 4.5, starts with regressing outcome (Y_2) on the STARS program (Tx) to assess the significance for the coefficient represented by path c in Figure 4.5. If path c

was significant, the outcome variable was then regressed on the hypothesized mediating variable (M) to determine the significance of the coefficient in path b .

Figure 4.5.

Mediation Diagram



Conditional on significant coefficients for paths c and b , path a was then estimated in a model with Tx and M used as predictors of the outcome Y_2 . If a theoretical mediating path exists, the direct path between Tx and Y_2 , represented by c' in Figure 4.5, is no longer significant (Barron & Kenny, 1986; MiKinnon et al., 2002). Lastly, if the above conditions are met, the standard errors and coefficients of paths a and b are used to estimate the significance of the indirect effects using the Sobel (1982) test.

Figure 4.6

The Standard Error of the Indirect Effect

$$SEab = \sqrt{b^2 SEa^2 + a^2 SEb^2}$$

The test proposed by Sobel (1982) in Figure 4.6 requires the square root of the direct effect of b^2 multiplied by the squared standard error of a (SEa^2) plus the squared indirect effect of a^2 multiplied by the squared standard error of b (SEb^2). Significance of the indirect effects, as well as all associations modeled in the analysis strategy, were assessed using a two-tailed test with $\alpha = .05$.

CHAPTER 6

RESULTS

The results section will begin by summarizing the characteristics of the student participants involved in the study. All study findings are organized in the order presented in the analysis strategy subsection of the methods chapter (i.e., selection bias, feasibility and social acceptability, main effects, moderating effects, mediating effects).

Participants

Students and teachers from seven public schools in a Mid-Atlantic state participated in the study. One of the seven schools was an independent charter, three were district magnet programs, and three were regular education public schools. A total of 42 fourth and fifth grade teachers provided data on student performance. Among teachers providing data, 43% of the sample included fourth grade teachers and 76% were female. Forty seven percent of teachers identified as African American, 6% as Latino American, and 47% as European American. Students in 23 of the 42 classrooms were randomized to the STARS program.

Among students, 108 fourth and fifth graders provided data for analysis. Fourth grade students constituted 51.9% of the sample. Forty-two percent of the students were female and the average age was 10.4 years ($SD = 0.89$). Teacher report data indicated the student sample consisted of 68.5% African American, 18.5% European American, 7.4% Latino American, 4.6% Mixed American, and 1% Asian American students. Administrative records indicated 56.5% of the students received free and reduced price lunches. Thirty-four percent of the

participating students received special education services; 71.4% for a learning disability and 28.6% for an emotional disturbance.

Selection Bias

As shown in Table 5.1, no statistically significant differences were observed between the demographic characteristics of students randomized to STARS and control conditions.

Table 5.1

Demographic Characteristics of the Sample by Treatment Assignment

	STARS (<i>n</i> = 60)		Control (<i>n</i> = 48)		Total (<i>N</i> = 108)		χ^2 (<i>p</i> < .05, df)
	%	(<i>n</i>)	%	(<i>n</i>)	%	(<i>N</i>)	
Sex							
Male	62%	(37)	54%	(26)	58%	(63)	.617 (<i>p</i> = .278, 1 df)
Female	38%	(23)	46%	(22)	42%	(45)	
Grade							
Fourth	57%	(34)	46%	(22)	52%	(56)	1.254 (<i>p</i> = .333, 1df)
Fifth	43%	(26)	54%	(26)	48%	(52)	
Ethnicity							
AfAm	70%	(42)	67%	(32)	69%	(74)	3.506 (<i>p</i> = .545, 1 df)
EuAm	15%	(9)	23%	(11)	19%	(20)	
HLAm	7%	(4)	8%	(4)	7%	(8)	
MdAm	7%	(4)	2%	(1)	6%	(5)	
AsAm	1%	(1)	0%	(0)	1%	(1)	
Special Ed.							
None	67%	40	64%	31	66%	(71)	.051 (<i>p</i> = .841, 1 df)
ED	13%	8	13%	6	13%	(14)	
LD	20%	12	23%	11	21%	(23)	
FRL							
Yes	52%	31	63%	30	57%	(61)	1.273 (<i>p</i> = .329, 1 df)
No	48%	29	37%	18	43%	(47)	

Notes: AfAm = African American; EuAm = European American; HLAm = Hispanic Latino American; MdAm = Mixed American; AsAm = Asian American; ED = Emotional Disturbance; LD = Learning Disabled; FRL = Free and Reduced Lunch.

Table 5.2 presents the pretest means, standard deviations, and test statistics using treatment assignment as the group variable. Levene's test statistic suggested the variances between the pretest means of the two groups of students were equal (*p* < .05). As shown in

Table 5.2, no significant differences were observed for student pretest scores on all outcome variables.

Table 5.2

Prescreen and Pretest Scores by Treatment Assignment

	STARS (<i>n</i> = 60)		Control (<i>n</i> = 48)		<i>t</i> (<i>df</i> = 106) [#]	<i>p</i> < .05
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)		
BEHAV*	.649	(.111)	.663	(.135)	0.568	0.571
BEHAV1	.651	(.121)	.636	(.141)	0.624	0.534
AUTH1	.700	(.167)	.661	(.192)	1.233	0.224
COGCON1	.526	(.140)	.547	(.167)	0.726	0.470
AUTO1	.588	(.135)	.594	(.107)	0.253	0.801
SOCOM1	.704	(.118)	.674	(.143)	1.182	0.240
RELt1	.674	(.106)	.679	(.134)	0.184	0.854
RELS1	.807	(.179)	.812	(.155)	0.143	0.887
FRIENDS1	.849	(.133)	.852	(.158)	0.093	0.926
LIKEt1	.675	(.188)	.659	(.201)	0.685	0.495
MOTIV1	.599	(.123)	.626	(.146)	1.015	0.312

Notes: BEHAV* = the prescreening instrument used to identify students. # = Equality of variances assumed.

Intervention Feasibility and Social Acceptability

Students (*N* = 108) and teachers (*n* = 23) randomized to the STARS intervention responded to a feasibility and social acceptability questionnaire upon the conclusion of the study. There were no statistically significant differences in the response patterns among the fourth (*n* = 11) and fifth (*n* = 12) grade teachers or among fourth (*n* = 34) and fifth (*n* = 26) grade students who responded to the survey.

Feasibility. Teachers were asked if they felt the monitoring procedures were reasonable for teachers and students, if the intervention was easy to implement, and if the intervention fit into current school-wide PBIS activities. Among teachers who indicated the intervention was *often* or *always* reasonable, 69.6% and 78.3% of teachers agreed the

procedures were reasonable for teachers and students, respectively. Eighty-three percent of teachers responded the intervention *often* or *always* fit into the school-wide PBIS activities.

Students were asked whether the self-monitoring was easy, if it was easy to compare their own data with that of their teachers, and whether the data were helpful in writing goals. Among students who agreed the intervention activities were *often* or *always* easy to engage in, 74.6 said that self-monitoring of behavioral goals was easy, only 5% felt comparing their data with the teacher data was easy, and 60% felt writing goals using the data was easy.

Social acceptability. Teachers were asked if the intervention was acceptable for an elementary school and for elementary students, whether the intervention resulted in negative side-effects for students, and whether teachers felt they would continue to use and recommend the intervention to others. Among teachers who agreed the intervention was *often* or *always* appropriate, 91.3% and 86.9% of teachers felt the intervention was *often* or *always* appropriate for an elementary school and elementary students, respectively. When asked if they would continue to use self-monitoring strategies, 69.1% said they would *often* or *always* continue to use the intervention and 69.6% said they would *often* or *always* recommend it to other teachers.

Students were asked if they thought STARS was fun, if the program made school more fun, and if participating in STARS caused problems with their friends or helped them get along better with their teacher. Among students who agreed program activities were *often* or *always* fun, 66.7% stated STARS was fun and that 53.7% agreed STARS made school more fun. However, 11.9% of students agreed that participating in STARS caused problems with their friends. Fifty percent of students felt they got along better with their teacher as a result of participating in STARS.

Main Effects

The coefficients and model fit statistics for the robust regression models to test the main effects of STARS on all posttest outcomes are presented in Table 5.3 All main effects models controlled for pretest scores (Pre) on each dependent variable. The independent variable, Tx (STARS = 1, Control = 0), was included in each model. In addition, all models included the following student-level predictors: RACE (AfAm; African American = 1, others = 0), SEX (female = 1, male = 0), FRL (Yes = 1, No = 0), SPED (Yes = 1, No = 0) and AGE scaled in number of months since birth.

For all robust regression models, an *F*-test indicated whether there was a significant association between the selected predictors and the outcome. No significant associations were observed at the $p < .05$ level between STARS and teacher ratings of student cognitive concentration, relatedness with students, student autonomy, or student motivation. In addition, no significant associations were observed for student rated relations with teachers or peers at the $p < .05$ level. Significant associations, however, were observed between STARS and the dependent variables assessing disruptive behavior, authority acceptance, social competence, and teacher ratings of student-teacher relations.

First, given the study design, STARS appears to have caused improvements in student behaviors at posttest, $R^2 = .52$, $\Delta R^2 = .48$, $F(7, 41) = 19.98$, $p = .001$. The estimated robust regression coefficient for Tx = .058 ($p = .03$, 95% CI [.011 - .123]) suggested students exposed to STARS, compared to control students, scored .058 points higher on teacher rated behavior at posttest when controlling for the variance in pretest performance and other student characteristics (ES = .46). Adjusting for the number of variables in the model, the independent variable, STARS (i.e., Tx), and the control variables (i.e., BEHAV1 pretest,

RACE, SEX, FRL, AGE, SPED) explained 48% of the variance in behavior at posttest. In addition, sex was significantly associated with behavior at posttest. Controlling for the variance in pretest performance and other student characteristics, the coefficient for sex = .049 ($p = .036$, 95% CI [.003- .095]), suggested females, compared to males, scored .049 points higher on teacher rated behavior at posttest.

STARS, given the study design, appears to have caused improvements in teacher rated authority acceptance at posttest, $R^2 = .56$, $\Delta R^2 = .53$, $F(7, 41) = 17.73$, $p = .001$. The coefficient for STARS = .061 ($p = .02$, 95% CI [.006- .115]) suggested students exposed to STARS, compared to control students, scored .061 points higher on teacher rated authority acceptance at posttest when controlling for the variance in pretest performance and other student characteristics ($ES = .47$). Adjusting for the number of variables in the model, the independent variable, STARS (i.e., Tx), and the control variables (i.e., AUTH1 pretest, RACE, SEX, FRL, AGE, SPED) explained 53% of the variance in the dependent variable, authority acceptance. In addition, race was significantly associated with authority acceptance. Controlling for the variance in pretest performance and other student characteristics, the robust regression coefficient for RACE = -.08 ($p = .001$, 95% CI [.13- .033]), suggested African American students, compared to all other students, scored .08 points lower on teacher rated authority acceptance at posttest.

Given the study design, STARS appears to have caused improvements in teacher rated student social competency at pretest, $R^2 = .50$, $\Delta R^2 = .47$, $F(7, 41) = 18.23$, $p = .001$. Adjusting for the number of variables in the model, the independent variable, STARS (i.e., Tx), and the control variables (i.e., SOCOM1 pretest, RACE, SEX, FRL, AGE, SPED) explained 47% of the variance in social competence scores. The coefficient for Tx = .064 (p

= .02, 95% CI [.011- .123]), suggested students exposed to STARS, compared to control students, scored .061 points higher on teacher rated social competence at posttest when controlling for the variance in pretest performance and other student characteristics (ES = .55). In addition, special education was negatively associated with social competence. Controlling for pretest performance and other student characteristics, the robust regression coefficient for SPED = -.049 ($p = .001$ CI [.094 - .004]), suggested special education students, compared to all other students, scored .049 points lower on teacher rated social competence at posttest.

Lastly, given the study design, STARS appears to have caused improvements in teacher perceptions of the quality of their relations with STARS students at posttest, $R^2 = .48$, $\Delta R^2 = .44$, $F(7, 41) = 15.66$, $p = .001$. Adjusting for the number of variables in the model, the independent variable, STARS (i.e., Tx), and the control variables (i.e., RELt1 pretest, RACE, SEX, FRL, AGE, SPED) explained 44% of the variance in the dependent variable, relatedness. The estimated robust regression coefficient for Tx = .050 ($p = .036$, 95% CI [.006- .115]), suggested that students exposed to STARS, compared to control students, scored .050 points higher on teacher rated student-teacher relatedness at posttest (ES = 0.39). In addition, the robust regression coefficient for a student's sex = -.040 ($p = .023$ CI [.005 - .075]), suggesting females, compared to males, scored .040 points higher on teacher rated student-teacher relatedness at posttest. Lastly, controlling for pretest and other student characteristics, the robust regression coefficient for free and reduced lunch = -.060 ($p = .011$ CI [.107 - .015]), suggested special education students, compared to general education students, scored .060 points lower on teacher rated student-teacher relatedness at posttest.

Table 5.3

Unstandardized Estimates for Outcomes Significantly Associated with STARS (Tx)

	BEHAV3			AUTH3			SOCOM3			RELt3		
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>b</i>	<i>SE</i>	<i>t</i>	<i>b</i>	<i>SE</i>	<i>t</i>	<i>b</i>	<i>SE</i>	<i>t</i>
Predictors												
int	.515	.247	3.390	.399	.210	1.900	.450	.246	1.830	.195	.200	.970
Pre	.487*	.144	2.250	.524*	.089	5.870	.517*	.133	3.900	.602*	.078	7.700
Tx	.059*	.026	-1.780	.061*	.027	2.260	.067*	.028	2.420	.050*	.023	2.170
AfAm	-.056	.031	2.160	-.080*	.023	-3.440	-.044	.029	-1.500	.013	.025	.510
Sex	.049*	.023	-1.490	.032	.018	1.790	.045	.022	2.020	.040*	.017	2.360
FRL	.038	.025	-.600	-.030	.030	-1.010	-.039	.027	-1.440	-.061*	.023	-2.660
Age	-.001	.002	-2.060	.000	.002	.040	-.001	.002	-.310	.001	.002	.490
SPED	-.046*	.023	2.080	-.034	.023	-1.480	-.049*	.022	-2.230	-.019	.019	-.980
Model Fit												
<i>F</i>		19.02*			17.73*			19.98*			15.56*	
<i>R</i> ²		.516			.559			.500			.479	
ΔR^2		.477			.529			.465			.442	

Notes: BEHAV2 = Behavior Scale at posttest; AUTH2 = Authority Scale at posttest; SOCOM2 = Social Competence Scale at posttest; RELt2 = Student-Teacher Relationship Scale at posttest; *b* = unstandardized coefficient; int= intercept, Pre = Coefficient for that outcome as measured at pretest; ΔR^2 = Adjusted *R*²; * *p*<.05.

Moderation Effects

No moderation effects were observed at the $p < .05$ level for all dependent variables assessing behavior, authority acceptance, cognitive concentration, social competence, autonomy, teacher rated relations with students and between students, student rated relations with teachers and peers, or motivation.

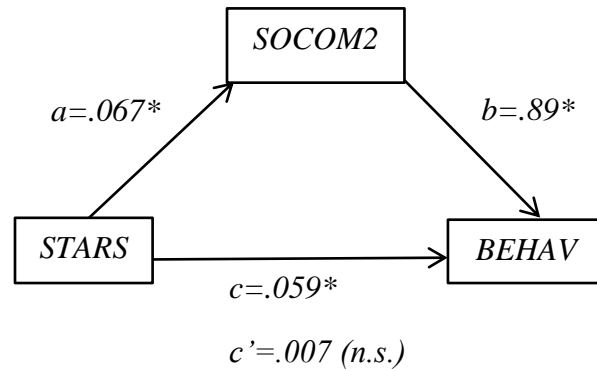
Mediation Effects

It was hypothesized the effect of STARS on (a) motivation and (b) behavior would be mediated (i.e., partially or fully) by teacher reported student autonomy (AUTO2), relatedness (RELt2), and social competence (SOCOM2). Consistent with analyses of main effects and moderation models, all mediation models included all student-level predictors. Mediation analyses followed the three step unstandardized product coefficients method which includes (1) a significant direct relation between STARS and the outcome, (2) a significant relation between the mediator and the outcome, and (3) and a model with STARS and the mediator used as predictors of the outcome (Barron & Kenny, 1986; McKinnon et al., 2002). In a fully mediated model, the direct path between STARS and the outcome is no longer significant.

The first step of the process was not satisfied to test mediation models for the motivation outcome; however, the Sobel (1982) test results indicated the effect of STARS on behavior was fully mediated through social competence ($t = 2.407, p = 0.016$). The estimate for path c of Figure 5.1 representing the relationship between STARS and behavior was significant. Next, the coefficient for path b of Figure 5.1 suggested the relationship between social competence and behavior was significant. Lastly, when both STARS and the hypothesized mediator were used as predictors of behavior, the direct path between STARS and behavior, represented by c' in Figure 5.1, was no longer statistically significant.

Figure 5.1

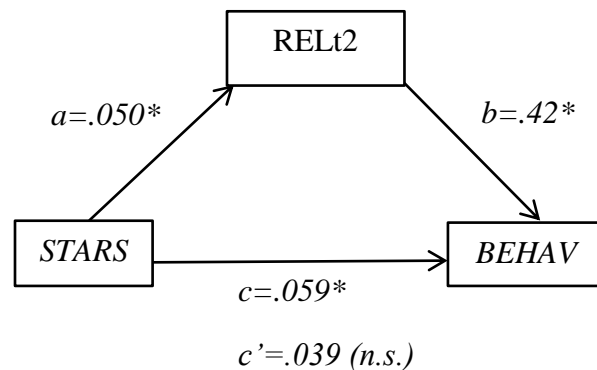
Effect of STARS on Behavior as Mediated by Social Competence



Next, all the conditions of the unstandardized product coefficients (Barron & Kenny, 1986; McKinnon et al., 2002) process were met to suggest the effect of STARS on behavior was mediated by relatedness. As previously established, the path c in Figure 5.2 was significant. Next, the coefficient for path b of Figure 5.2 suggested relatedness significantly predicted behavior. Lastly, when both STARS and relatedness were included as predictors of behavior, path c' of Figure 5.2 between STARS and behavior was no longer statistically significant.

Figure 5.2

Effect of STARS on Behavior Mediated by Relatedness



However, the Sobel tests indicated the model was not statistically significant ($t = 1.62, p = .113$), suggesting that the relationship between STARS and behavior was not mediated through relatedness (Sobel, 1982).

Lastly, a model examining the effects of STARS on posttest changes in behavior as mediated through autonomy could not be estimated. The second condition of the unstandardized product coefficients (Barron & Kenny, 1986; McKinnon et al., 2002) process was not satisfied. No significant relationship between the mediator, autonomy, and STARS was observed to proceed with the testing of a mediation model.

CHAPTER 7

DISCUSSION

The purpose of this dissertation was to examine the feasibility and effectiveness of STARS, a manualized, self-monitoring program designed to be a selective intervention within a tiered response model. Randomization took place at the classroom level. A screen was used to identify 20% ($N = 108$) of students in fourth and fifth grades with the highest levels of disruptive behaviors across seven schools and 42 fourth and fifth grade classrooms.

For students with disruptive behaviors, STARS appears to have caused improvements in teacher reported classroom behavior, social competence, student-teacher relations, and authority acceptance. The main findings from the dissertation study align with prior meta-analyses on the positive effect of self-monitoring interventions for behavioral outcomes (Briesch & Chafouleas, 2009; Fantuzzo et al., 1988; Fantuzzo & Polite, 1990). However, the current study extends prior research by examining the effects of self-monitoring using a randomized trial and a larger sample, which advances the research and multidisciplinary field of behavioral intervention in education settings.

To provide students with similar training and intervention procedures, a variety of scientifically-based features were integrated within a STARS program manual. The features included direct instruction in social and self-awareness, self-management, communication, and decision making skills. Skills were delivered to students by school personnel using SAFE instructional procedures (Durlak et al., 2011). After student training, autonomy supportive opportunities were provided for students to practice the skills using self-monitoring

procedures. Both students and teachers monitored and provided data on student behavioral goals. The data were then used in a formative feedback process to compare student and teacher data, enhance skill competencies, rewrite goals, and improve relations. Prior studies suggest these features augment student skill acquisition and improve outcomes (CASEL, 2005; Durlak et al., 2011; Ialongo et al., 2001; Lane et al., 2011; Wentzel, 2008).

Selective Interventions: Autonomy Support Alternatives

The main findings in this study suggest school personnel can teach students skills that improve classroom behavior. More importantly, the results of the mediation analysis suggest that the effect of STARS on classroom behavior occurred through social competence training. Because STARS includes strategies to improve social competency skills, provides opportunities for students to practice the skills, and structures feedback to enhance student skills, it makes logical sense that changes in social competence fully mediated the improvements in behavior. The main findings from this study reinforce the growing knowledge that school personnel can alter disruptive student behaviors through faithful application of well-designed, theoretically rigorous interventions despite the many powerful influences beyond the walls of a school that shape such behaviors (Durlak et al., 2011; Wilson & Lipsey, 2008).

Mandated action. Although goals central to NCLB (2001) and IDEA (2004) suggest school personnel are obliged to intervene in disruptive behaviors using a tiered response model, the success of the efforts require school personnel to have access to prevention interventions at all levels of the continuum. In the absence of such supports, prior research suggests school personnel often rely upon ineffective punitive and authoritarian strategies (Oliver et al., 2011). Although STARS, and all behavior interventions for that matter, require

school personnel to invest the time and effort to teach skills, the outcomes observed in this study suggest the investments are connected to valuable student outcomes. If school personnel used both effective universal and selective interventions that support student autonomy within a tiered response model, school personnel may advance two NCLB and IDEA goals: improve social and behavioral outcomes and reduce special education referrals. However, future research is required to fully investigate these processes.

Though NCLB (2001) and IDEA (2004) encourage the use of tiered response models to improve student outcomes, the OSEP criteria suggests that not all interventions enhance the effectiveness of a tiered approach. The most widely-used selective interventions include teacher managed behavioral approaches such as the CICO (Filter et al., 2007) and BEP (Crone et al., 2010). Although the CICO and BEP are efficient, effective, and meet OSEP criteria, they do not integrate direct instructional supports needed to improve student skills in self-management and self-regulation. Interventions such as the CICO and BEP do provide frequent and ongoing data to assess student responsiveness, and as such they are important components of a well-developed tiered response model. However, exclusive reliance on these strategies will not extend skills, opportunities, or feedback necessary for students to learn self-managed and self-regulated positive social behaviors.

STARS builds upon the effectiveness of CICO (Filter et al., 2007) and BEP (Crone et al., 2010) by extending direct instructional strategies to disruptive students in self-management skills. Furthermore, STARS structures opportunities for students to practice those skills using the autonomy supportive activity of self-monitoring. The STARS model draws upon the SDM process which posits skills and opportunities are important components of learning new behavioral strategies—but skills and opportunities alone are not sufficient to

improve disorderly behaviors. To enhance the process of integration and improve relations, STARS increases exposure to a supportive adult at school through a feedback process.

Data driven feedback. Self-monitoring data makes the feedback process used to assess the intersection of skills and opportunities a formative one. The formative feedback process is unique to STARS and is important for three reasons. First, teacher data are useful for meeting important requirements of a tiered response model. Second, the feedback data can enhance student competencies with specific and constructive feedback from school personnel to improve self-monitoring accuracy. Third, the process provides students and school personnel with opportunities to improve communication and relationships. Improved communication and relations can enhance bonds and encourage students to integrate and adopt conventional behaviors necessary to improve school success. These features differentiate STARS from teacher managed behavior interventions like the CICO (Filter et al., 2007) and BEP (Crone et al., 2010). Although future research may directly compare the interventions, available effect sizes provide a similar metric to compare the effectiveness of the approaches (Cohen, 1988).

The effect size estimates associated with STARS are derived from an adequately powered, randomized trial. By contrast, the CICO and BEP estimates are largely based upon less rigorous single subject designs (Filter et al., 2007; Hawken et al., 2007; Kauffman, 2008; McIntosh et al., 2009). Prior studies of teacher managed behavioral strategies such as the CICO ($ES = .48 - 1.04$; McIntosh et al., 2009) and the BEP ($ES = .37$; Crone et al., 2010) have suggested the interventions are associated with mild to large effects for improvements in student behavior. The current study suggests STARS is directly related to moderate effects for improving teacher rated student behaviors ($ES = .46$), authority acceptance ($ES = .47$),

social competence ($ES = .55$), and the quality of student-teacher relations ($ES = .39$).

Furthermore, the results of mediational analyses confirm the STARS program theory. That is, the effect of STARS on behavior occurred through social competence training—a feature not directly endorsed in teacher managed behavioral interventions. In summary, the effectiveness of STARS is based on a rigorous design with mediational results confirming central aspects of the STARS program theory. In addition to being effective, a majority of teachers in STARS intervention classrooms agreed the strategy was also feasible.

Feasible process for teachers. The feasibility of STARS meets an important OSEP criterion for a selective strategy. A feasible intervention, such as STARS, increases the likelihood of faithful program application which improves student outcomes (Benbenishty & Astor, 2005; Colvin & Sprick, 1999; Goldstein & Brooks, 2007; Wilson & Lipsey, 2008). Feasible and effective strategies make it more likely that teachers will elect to use a positive intervention to replace ineffective authoritarian and reactive approaches. The findings from the STARS study align with prior studies to suggest self-monitoring activities are feasible for teachers (Briesch & Chafouleas, 2009; Mooney et al., 2005). However, the current study extends prior findings to suggest the intervention procedures were also feasible for students.

Feasible process for students. The finding that teachers rated the STARS procedures feasible for students is important for two reasons. First, increasing student involvement in the behavior intervention is a key aspect that distinguishes STARS from teacher managed behavioral approaches. Second, the formative feedback process differentiates STARS from teacher managed interventions. Although both approaches produce the frequent and ongoing teacher monitoring data necessary to assess fidelity and student responsiveness, STARS integrates autonomy supportive opportunities for students to practice interpersonal skills. By

comparing data from self-monitoring and teacher monitoring of behavior, students gain explicit insight into the expectations necessary to achieve success. Though the current study relied on counselors to guide students through the feedback process, future studies may explore the feasibility of teachers engaging students in the process.

The absence of moderation effects also highlights the feasible nature of STARS. The lack of significant moderation terms aligns with prior findings that self-monitoring can be effective with a variety of students (Breisch & Chafouleas, 2009). Prior research does suggest disruptive behaviors differ in manifestation and underlying causes that are sometimes related to child characteristics (e.g., gender, race, social demographics; Crick & Grotpetter, 1995; Leff & Crick, 2011). Because many of these characteristics are not malleable, some research suggests different intervention modalities should be used (Potter, 2004). Although it is reasonable to assume some conditions would necessitate a tailored intervention dependent upon student characteristics, this can be a difficult task to accomplish in a school setting. This reality is reflected in the OSEP (2011b) recommendation that a feasible selective strategy should be effective for all students. Although the data suggests STARS is equally effective for all student characteristics observed in this study, future studies may examine whether various subtypes of disruptive behavior (e.g., direct and indirect forms of aggression, overt and covert forms of antisocial behavior, anxiety and depression) or cognitive ability interact with the intervention.

In summary, STARS imparts skills, opportunities, and formative feedback to encourage the development of self-managed behaviors for disruptive students. Because schools are adopting tiered response models to improve student outcomes and reduce referrals for special education, school personnel need access to selective interventions that

improve student behaviors and reduce the number of students referred for indicated services. Although a well-developed tiered response model should include teacher managed behavioral approaches, these approaches alone will not help students develop self-managed and self-regulated behaviors to promote enduring change. As a logical next step in the continuum of scientifically-based strategies, the results of this study suggest STARS can extend widely-used teacher managed behavioral approaches. To extend the current effectiveness of programs like the CICO (Filter et al., 2007) and BEP (Crone et al., 2010), students can be taught skills in self-monitoring and then pair the skills with autonomy supportive opportunities for practice. Just as important—the intersection of skills and opportunities must be met with a formative and supportive feedback. Formative feedback enhances skill acquisition, hones competencies, and serves as a venue to improve student-teacher relations. A healthy relationship with an adult at school is central to helping students adopt and internalize self-managed and self-regulated positive social behaviors (Hawkins & Weis, 1985; Wentzel, 2008). Although promising, the strengths and limitations of the study findings condition their implications for current policy, practice, and future research in the prevention of disruptive behaviors.

Study Strengths

A central strength of the current study is its use of a randomized design. When treatment and control groups are equivalent, randomization allows researchers to make causal inferences regarding program effects (Fraser et al., 2011; Shaddish et al., 2006). The design improves the external validity of the findings for students with disruptive behaviors.

The sampling procedures and size of the sample are also strengths of the study. The use of a universal screening procedure narrowed the sample to include the 20% of students

with elevated levels of disruptive behaviors. A number of studies suggest self-monitoring interventions improve student outcomes, but the assumptions are based on studies that included small sample sizes (i.e., 1 - 12 students; Briesch, & Chafouleas, 2009; Fantuzzo et al., 1988; Fantuzzo & Polite, 1990; Mooney et al., 2005; Thompson & Webber, 2010). Although a sample size of 108 students is modest, when contrasted against prior samples used in studies of self-monitoring interventions, it is an improvement that lends credibility to self-monitoring as a feasible and effective intervention.

In addition to the main findings—an important aspect of the current study was the testing of mediational effects. The indirect relationship between STARS and behavioral improvements as mediated by social competence supports the concepts inherent in SDT and the SDM as well as the hypotheses posited in the STARS program theory. SDT recognizes competency refers to feeling successful at balancing internal needs and external requirements (Deci, 1975; Ryan & Deci, 1992; Wiggfield et al., 2002). However, many children with disruptive behaviors are not equipped with internalized social and behavioral accoutrements that help them be successful in meeting those requirements at school. The SDM purports that these students require skills and the opportunities to learn new behaviors. The SDM also suggests the intersection of skills and opportunities should be met with reinforcements to encourage students to develop competencies. However, the STARS program theory merges the above concepts to suggest students need direct instruction in skills and autonomy supportive opportunities to present the skills. Furthermore, when skills and autonomy supportive opportunities are met with socially supportive feedback to improve the use of skills, most students can rise to the behavioral expectations required at school. The results of

the mediational analysis in this dissertation support an instructional approach, autonomy support, and formative feedback are valid processes for encouraging positive behaviors.

The positive outcomes caused by STARS are noteworthy when contrasted against the brief nature of the intervention. Even though students were exposed to the intervention for 6 weeks over the course of the study (i.e., 2 weeks of training and 4 weeks of self-monitoring), exposure was adequate to improve behaviors. Prior studies do suggest outcomes are improved when students engage in behavior support strategies throughout the course of the school day (Barrish et al., 1969; Jacobson, 1998). In addition, brief and flexible school-based interventions fit well within the context of school and improve implementation fidelity (Colvin & Sprick, 1999; Goldstein & Brooks, 2007; Wilson & Lipsey, 2008). Despite the positive aspects of the intervention, there are important limitations to consider.

Study Limitations

To begin, the current study included only two time points. To assess developmental changes associated with self-monitoring interventions, a longitudinal design and multiple waves of data collection would add rigor to future study findings. Such a design would control for history effects (Shaddish et al., 2006) and strengthen the understanding of whether self-monitoring interventions improve the long-term success of student outcomes.

A second limitation of the study is that a convenience sampling strategy was used. Available schools were selected by district officials. Further, only schools with existing universal supports and principals willing to commit to making STARS a high priority were selected. However, prior research suggests when principals make behavior support a priority; those principals encourage faithful implementation of such supports which improves student outcomes (Benbenishty & Astor, 2005; Durlak et al., 2011; Sugai & Horner, 2008; Wilson &

Lipsey, 2008). This limitation reflects the reality of school-based intervention studies. In addition, not all students consented to participate. Though 158 were identified in the screening process, only 108 remained after consent procedures. However, observations suggest no significant differences existed between those randomized to the study and those without consent.

Similar to many school-based intervention studies, the findings of the current study relied upon teacher report of classroom behavior and relations with students. A key issue related to the reliance upon teacher data is that teachers were not masked which could produce social desirability effects. Future research may rely upon trained classroom observers to supplement teacher report data and reduce the risk of “Hawthorne” effects (Shaddish et al., 2006). In addition, prior studies suggest that teacher reports of student behaviors vary greatly (Riebin & Balow, 1978) whereas other studies suggest teachers are reliable reporters on student behavior and relationships in the context of school (Huesmann, Eron, Guerra, & Crawshaw, 1994). Though the current study did collect student data—no differences were observed in student ratings of peer relations or intrapersonal constructs such as perceived autonomy and motivation. Future studies can benefit by extending these results to examine changes in more stable constructs using reliable student report measures.

Estimates from the study were generated using robust regression models. When clusters are the unit of randomization, the results obtained from ordinary least squares lead to overstated findings (Schochet, 2005). Robust regression corrects for the intraclass correlations through a Huber-White or “sandwich estimation procedure” (Curran & Muthen, 1999; Stata, 2011). To ensure the study data were modeled in the most robust yet parsimonious manner, multilevel models were originally estimated. Unconditional multilevel

models suggested intraclass correlations—the proportion of unexplained variance between classrooms—ranged from .04 to .33 for all observed outcomes. Conditional models were then tested with student level 1 covariates, treatment and classroom modeled at level 2, and school assignment treated as a level 2 random effect. Although estimates did slightly differ, the multilevel modeling and robust regression outcomes were similar. In addition, the current study extends prior findings of self-monitoring studies by accounting for the clustered nature of the data (Briesch & Chaffouleas, 2009; Fantuzzo et al., 1988; Thompson & Webber, 2010), future analysis approaches, however, may take advantage of multilevel and growth modeling procedures (Singer, 2008). Despite the limitations, broader implications for policy, practice, and future research for intervention in disruptive behaviors arise from this study.

Implications for Policy, Practice, and Research

Policy. Because NCLB (2001) and IDEA (2004) aim to improve student outcomes and reduce referrals for indicated services, the study has important policy implications. To begin, federal policy initiatives, such as the H.R. 2437, The Academic, Social, and Emotional Learning Act (<http://thomas.loc.gov/cgi-bin/query/z?c112:H.R.2437>), are important efforts for elevating the value of teaching all children the skills to develop social and emotional competencies. Currently, a great deal of federal and state education policy focuses on the instruction and assessment of two school subjects: reading and math. When little attention is provided to the purposeful development of the social character of students in schools, it can be difficult to effectively provide high quality academic instruction.

Independent of the federal government, some states have generated policy efforts to encourage the development of social, cognitive, and emotional competencies for students. For example, Illinois (http://isbe.net/ils/social_emotional/standards.htm) and New York

(<http://www.p12.nysed.gov/sss/sedl/>) have recently adopted learning standards and assessment procedures that communicate the value of teaching students necessary school behaviors which translate into valuable life skills. Findings from this study support the urgency of these efforts for struggling students. In addition, policy initiatives of NCLB (2001) and IDEA (2004) encourage the use of effective, data driven interventions to assess a student's response to an intervention. The teacher data that is a by-product of the STARS process assists practitioners to meet these important policy requirements.

Practice. The practice implications from the study are perhaps the most salient. Most important, regardless of strong influences beyond the walls of a school, student behaviors are responsive to instructional supports. That is, school related contingencies have the capacity to alter the impact of environmental influences, including family, peer, and neighborhood risk factors. However, supportive and preventative approaches require effective supports at all levels of a tiered continuum. STARS fills an important gap by providing a program for school personnel that meets the requirements of a tiered response model. With access to the proper supports in a tiered response model, the compounded influence of effective universal and selective strategies can make a real difference in the lives of students (Wilson and Lipsey, 2008).

Because quality prevention starts with accurate assessment (Sameroff, 2005), the prescreening of 762 students in this study suggests school personnel can effectively use such procedures to identify students with elevated levels of disruptive behaviors. Once students are identified, they can be provided with selective support strategies before the behaviors decline and worsen. Also important for prevention is the use of ongoing and frequent data. The STARS process provides school personnel with relevant and timely data that are

frequent and can accurately target a behavioral deficit important for assessing student responsiveness and intervention fidelity.

STARS offers school practitioners (i.e., school social workers, counselors, school psychologists) a way to support classroom teachers in a collaborative manner. In the current study, Mission Coordinators provided students with training which reduced teacher burden and made the intervention more feasible. However, teachers participated in the STARS process by providing daily data regarding student behavior performance. The data were then used by school-based practitioners to assist students with reshaping behavior goals. These types of collaborations between teachers and school-based practitioners can improve data driven efforts that surround students with supports and encourage the development of new behaviors. This is an important aspect of STARS in this evidence-based and data driven era that school social workers and other support personnel are working within.

Because school social workers, more than school psychologists or counselors, spend time providing direct student services for behavioral and mental health needs (Allen-Mears, 2006; Brener, Martindale, & Weist, 2001; Constable, McDonald, & Flynn, 1999, Dupper, 2003; Shapiro, Angello, & Eckert, 2004) the results of this study advances the field of school social work. More and more, states are developing evaluation standards to assess all activities taking place in school settings, including those activities of student support personnel. School social workers, and all support personnel for that matter, can benefit from a manualized intervention such as STARS. Packaging effective instructional practices in manner that improves the capacity of school social workers and other practitioners to measure their own effectiveness will improve fidelity and student outcomes (Durlak et al., 2011). Researchers can assist school personnel to evaluate their efforts by integrating theory and research-

supported features into manualized programs with easy to use data mechanisms to evaluate student performance. That is, programs that incorporate ongoing data collection procedures make those strategies more effective within a tiered response framework and improve the collaborative efforts of school personnel to intervene in problem behavior.

Research. Future research should explore the development of available supports that integrate features of effective programs in a manner that also meets the basic criteria for use within a tiered response model. Programs that produce ongoing and sensitive data are useful for school personnel to assess student responsiveness to the supports.

Furthermore, when it comes to the development of school-based programs, intervention research is a grounded approach for understanding the effects of certain programs and practices (Sugai & Horner, 2009). Effectiveness studies in real school settings allow researchers to understand the limitations, strengths, and real world effects of a program. The information collected from such research can position effects size estimates in the context of a school setting. However, many barriers exist to testing the effectiveness of interventions in the context of a school (Fraser et al., 2011).

Among the many challenges in school settings faced by intervention researchers is the difficult and ethically charged issue surrounding the randomization of students who need support services (Trochim, 2001). Future studies can more effectively manage these challenges by making better use of design features (Schochet, 2005). For example, regression discontinuity and switching replications designs alleviate ethical concerns surrounding the randomization of children with significant needs to control conditions (Trochim, 2001).

Central to the research process of understanding the effectiveness of school-based interventions is the assessment of fidelity. The results of this dissertation rely upon an intent-

to-treat analysis (Fraser et al., 2011). An intent-to-treat approach assumes all participants have equal and full exposure to all program elements. The reality in schools, however, is very different: students miss sessions, refuse to participate, and personnel do not adhere to program prescriptions. However, future research can take advantage of using fidelity measures to create dosage variables that may be used to condition the modeling of treatment effects (Fraser et al., 2011). Particularly important to tiered response models, maintaining fidelity measures at multiple levels can help to condition analyses of study results and examine the differential effects that universal and selective interventions have under real world conditions when they are integrated within a tiered response framework.

Concluding Comments

Although many school personnel, particularly teachers, enter education to teach children skills in reading, writing, math, or science, they often find themselves overwhelmed by the 20% of children in their classrooms with disruptive behaviors (Clunies-Ross et al., 2008; Grayson & Alvarez, 2008; Hastings & Bham, 2003; Joseph & Strain, 2003). All too often, teachers become mired in the mindset that they are powerless against the community, family, and peer influences that shape such behaviors (Goldstein & Brooks, 2007). However, when school personnel possess the tools to promote student autonomy, build relevant social competencies, and improve feedback and relationships, many of the 20% of students with disruptive behaviors can learn to adopt positive social behaviors. When 3 to 4 students in the average classroom display behaviors of such severity that 4 hours of instructional time per week is lost (Gresham, 2002; Hoagwood, 2003), the quantity of lost instructional time alone justifies supplementing universal approaches with effective selective supports for students with disruptive behaviors.

Without a doubt, more can be done in the context of the school setting to improve outcomes for all students. A small proportion of a school's students will most likely require indicated supports and special education services. However, school personnel can do a great deal more to support the 20% of students who struggle to meet school expectations. Selective interventions that target the 20% of students with elevated behavior problems need to rely upon a variety of approaches. However, promoting student autonomy, providing direct instruction in relevant skills, designing opportunities to practice those skills, and meeting those opportunities with supportive feedback to assist students to develop self-managed and self-regulated positive behaviors will benefit them in both school and life beyond.

APPENDIX A

Example of STARS Daily Goal Report

STARS DAILY GOAL REPORT

Student:

Date:

This student:	Completed his/her work	Kept body parts to self	Was considerate of others	Followed directions	Stayed in assigned area
8:00 - 8:30	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
8:30 - 9:00	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
9:00 - 9:30	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
9:30 - 10:00	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
10:00 - 10:30	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
10:30 - 11:00	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
11:00 - 11:30	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
11:30 - 12:00	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
12:00 - 12:30	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
12:30 - 1:00	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
1:00 - 1:30	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
1:30 - 2:00	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No
2:00 - 2:30	Yes - No	Yes - No	Yes - No	Yes - No	Yes - No

Total # yes = 65

70% yes = 46

85% yes = 55

90% yes = 58

Notes & Assignments

Parent signature

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