# UNIVERSAL PROGRAMMING FOR SOCIAL EMOTIONAL LEARNING AND EFFECTS ON STUDENT COMPETENCE AND ACHIEVEMENT

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ABSTRACT

UNIVERSAL PROGRAMMING FOR SOCIAL EMOTIONAL LEARNING AND EFFECTS ON STUDENT COMPETENCE AND ACHIEVEMENT

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Many students have inadequate social-emotional skills, which, can negatively affect academic performance, behavior, and overall well-being (Blum, Libbey, Bishop, & Bishop, 2004; Rimm-Kaufman, Pianta, & Cox, 2000; Zigler & Bishop-Josef, 2006). Schools, because of their public educational role and the significant time that children spend there, can provide an ideal context for social-emotional development and intervention (Rones & Hoagwood, 2000; Weisz, Sandler, Durlak, & Anton, 2005). Students who have experienced high quality, school-based, social-emotional learning (SEL) programs have demonstrated improved academic performance, attitudes toward school, and social-emotional skills as well as reduced conduct problems, anxiety, and aggression (Durlak et al., 2011; Payton et al., 2008). Yet, school infrastructures often fail to support the integration of SEL programming in ways that are sustainable and embedded in the day-to-day functioning of students and educators.

The purpose of this study was to examine the potential benefits of integrating *Second Step* (Committee for Children, 2012), a widely disseminated school-based SEL program, into an existing tiered model of educational programming. As such, the study addressed the following research questions: Controlling for baseline skills, do students receiving *Second Step* show greater improvement in social-emotional competence and academic achievement than students in a wait-list comparison group? If so, do improvements depend on student level of learning risk at baseline? Are intervention effects moderated by gender?

The primary research questions are answered through secondary analysis of existing data using a quasi-experimental wait-list comparison group design with pretest and posttest. The dataset included teacher ratings of social-emotional competence and academic achievement data collected at baseline and following SEL intervention for all students attending one elementary school.

The hypothesis that all students would benefit similarly from *Second Step* received mixed support. Statistically significant improvements for the intervention group were found only for academic outcomes and not social-emotional competence. Post-hoc analysis revealed that grade level moderated the effects of treatment, indicating that *Second Step* produced significantly greater gains in social-emotional competence and academic achievement for lower elementary students compared to upper elementary students. Lower elementary students' empathy skills, reading scores, and math scores significantly improved among those receiving *Second Step* compared to lower elementary students in the comparison group. The positive effects of *Second Step* participation on reading scores were specific to students demonstrating a moderate level of learning risk at baseline., Overall, girls showed greater improvements in social-emotional competence from pretest to posttest than boys, but gender did not moderate students' response to intervention as predicted.

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# CHAPTER 1

# INTRODUCTION

There has been much debate about the relative importance of academic versus social-emotional skills for learning and achievement, but decades of research have clearly shown that social, emotional, and academic skills are inextricably connected (Blum et al., 2004; Zigler & Bishop-Josef, 2006). This large and growing body of literature demonstrates that social and emotional competence equips children with the necessary skills to successfully manage their emotions, relationships, and behaviors, all of which are important prerequisite skills for school and life success (Jones, Greenberg, & Growley, 2015; Pianta, Hamre, & Allen, 2012; Raver & Knitzer, 2002, Wang, Haertel, & Walberg, 1997; Valiente, Lemery-Chalfant, Swanson, & Reiser, 2008). Deficits in these key areas, on the other hand, have been linked to a host of learning and school-related problems, including lower levels of self-concept, school attendance, and academic performance and higher incidence of internalizing symptoms, feelings of rejection, and social isolation (Graham & Juvonen, 1998; Guerra & Bradshaw, 2008; Juvonen, Nishina, & Graham, 2000; Masten & Coatsworth, 1998). Despite the growing empirical and practical support for the use of a continuum of social-emotional interventions to promote school and life outcomes for all students, integration of such programming with existing educational frameworks has been largely unrealized (Zins & Elias, 2006).

## A Shift Toward Prevention

School-based social and emotional programming has traditionally emphasized delivery of discrete services that reactively focus on the diagnosis and treatment of those few students exhibiting the most severe emotional and behavioral problems. One critique of this approach is that it often results in a fragmented system of redundant and ineffective services that are

disconnected from the more central framework of academic programming. With disproportionate efforts and resources devoted to intensive intervention targeting only those students exhibiting the most profound difficulties, traditional approaches to social-emotional programming deemphasize prevention and early intervention efforts. For this reason, approaches that tend to withhold supports and only intervene after significant delays and difficulties have emerged are often characterized as "wait to fail" initiatives.

An alternative to the "wait to fail" approach that has dominated K-12 education in recent years is a multi-tiered practice framework, often referred to in schools as Response to Intervention (RTI) or, more recently, the Multi-Tiered System of Supports (MTSS; Castillo et al., 2010; Batsche, Castillo, Dixon, & Forde, 2008). These multi-tiered approaches to educational programming have roots in the public health model of disease prevention that differentiates primary, secondary, and tertiary levels of intervention depending on the degree of need and response to intervention (Sugai & Horner, 2009). Schools operating on a multi-tiered model expend resources and deliver services on a continuum with the goal of preventing problems from developing and remediating existing problems before they can escalate (Gresham, 2005). The tiered model relies on universal screening, evidence-based practices, and continual progress monitoring to determine intervention effectiveness and inform educational decisions (Tilly, Reschly, & Grimes, 1999).

In the past decade, the RTI framework has gained both practical and empirical support as an effective model to promote core academic development (i.e., reading, math) for all students and to identify students at risk for learning difficulties (Jenkins, Hudson, & Johnson, 2007; Jimerson, Burns, & VanDerHeyden, 2007). This has not been the case, however, for school-based social-emotional and behavioral programming. Rather, these initiatives have traditionally

operated in fragmented and marginalized "silos", cut off from the day-to-day functioning of the formal education system (Sugai & Horner, 2009). In contrast to the more narrowly focused RTI framework, MTSS is a comprehensive evidence-based model of education that employs data-based problem solving to integrate programming into a unified system of tiered support (Gamm et al., 2012). The MTSS approach capitalizes on the interconnectedness of academic, behavioral, and social-emotional development to improve outcomes for all students (Lane & Menzies, 2003; McIntosh, Chard, Boland, & Horner, 2006). This integrated system of support is provided to students in tiers of increasing intensity according to student level of need. MTSS represents a needs-driven model that aims to ensure instructional and intervention resources reach students at suitable levels to promote outcomes for all students. The current study focused on universal SEL programming (Tier I), but the three tiers typically associated with the MTSS framework are provided in Figure 1 to illustrate the larger, multi-tiered context that the proposed initiative might operate.

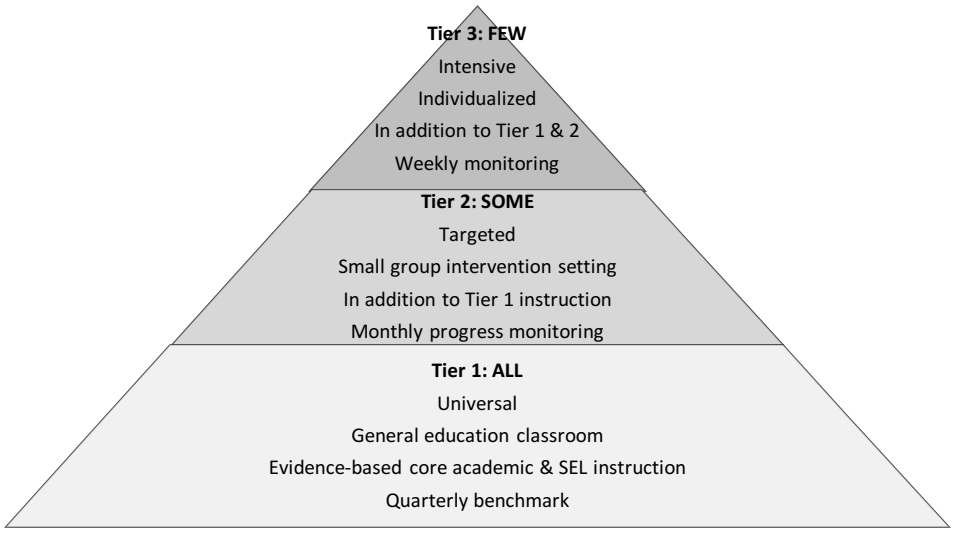


Figure 1. *Multi-Tiered System of Supports (MTSS) instruction and intervention.*

## Problem Statement

Limited social-emotional skills in the elementary years can have a negative effect on academic performance, behavior, and overall well-being (Blum et al., 2004; Rimm-Kaufman et al., 2000; Zigler & Bishop-Josef, 2006). Schools, because of their public educational role and the significant time that children spend there, can provide an ideal context for social-emotional development and intervention (Rones & Hoagwood, 2000; Weisz et al., 2005). A growing body of research indicates that social-emotional competence and academic achievement are interwoven and that integrated instruction and support in both areas can maximize student success (Zins & Elias, 2007) and reduce the risk of maladjustment (Elias et al., 1997; Zins, Bloodworth, Weissberg, & Walberg, 2004). However, school infrastructures often fail to integrate social and emotional learning in ways that are sustainable and embedded in the day-to-day functioning of students and educators.

## Social Emotional Learning and MTSS

In 1997, the term social emotional learning (SEL) was introduced to describe the process by which individuals "learn to recognize and manage emotions, care about others, make good decisions, behave ethically and responsibly, develop positive relationships, and avoid negative behaviors" (Zins et al., 2004). SEL provides a unifying conceptual framework for the organization and integration of school-based prevention programs. Students who have experienced high quality, school-based SEL programs have demonstrated improved academic performance, attitudes toward school, and social-emotional skills and reduced conduct problems, anxiety, and aggression (Durlak et al., 2011; Payton et al., 2008).

In response to growing research and interest in SEL, a variety of commercialized programs to help schools support the development of SEL have been developed (Merrell &

Gueldner, 2010). The Collaborative for Academic, Social, and Emotional Learning has identified 19 evidence-based SEL programs that have been found to promote positive academic, social-emotional, and behavioral outcomes in children and adolescents (CASEL, 2013). *Second Step: K-5 4th Edition* (Committee for Children, 2012), is one school-based, universal program recognized by CASEL for its established evidence base demonstrating effectiveness across grade levels and school contexts on increasing school success and decreasing problem behaviors through the promotion of social-emotional competence. Other national organizations have also endorsed *Second Step* as an SEL program meeting the criteria for evidence-based practice. For example, The U.S. Department of Education recommends *Second Step* as an exemplary program, reporting that there is evidence of the program's efficacy (Exemplary and promising safe, disciplined, and drug-free schools program, 2002). *Second Step* is also included in the Substance Abuse and Mental Health Services Administration National Registry of Evidence-based Programs and Practice (NREPP, 2009) and the Office of Juvenile Justice and Delinquency Prevention Model Programs Guide (OJJDP, n.d.).

*Second Step* is a universal, skills-focused SEL curriculum based on a cognitive problem-solving model with an emphasis on direct instruction of skills that strengthen the ability to learn, have empathy, manage emotions, and solve problems. According to the *Second Step* logic model, when students are provided direct instruction in social-emotional skills along with opportunities for practice and reinforcement, they are likely to demonstrate improvements in intermediate outcomes that lead to a cascade of positive distal outcomes (see Figure 2). The most recent edition of *Second Step* (Committee for Children, 2012) includes separate curricula for each grade to ensure developmentally appropriate and relevant instruction for all children. The program includes a total of 22 lessons that are organized across four units: (a) Skills for Learning, (b)

Empathy, (c) Emotion Management, and (d) Problem Solving. *Second Step* was designed to be delivered by classroom teachers and integrated with everyday classroom routines and activities.

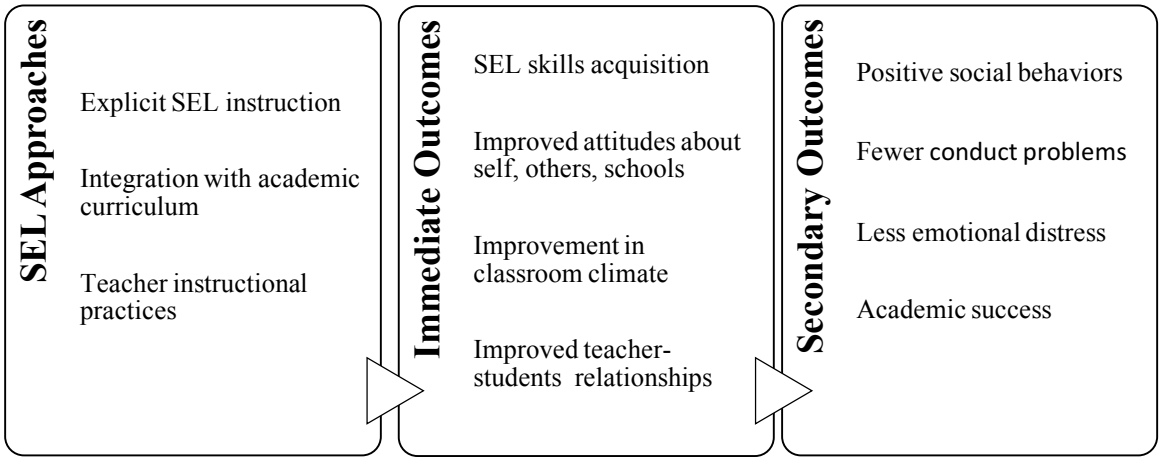


Figure 2. *Conceptual framework connecting school-based Social Emotional Learning (SEL) intervention to student outcomes.*

Despite growing empirical support and availability of programs like *Second Step* that are designed to be implemented in the school setting, a wide gap exists between research and practice in school-based SEL programming (Weisz et al., 2005). One key barrier to the implementation of multi-tiered SEL programming is the commonly held assumption among educators that the promotion of SEL in the classroom would necessarily compete with other high priority objectives for which schools are held accountable (Seifer et al., 2004). It stands to reason that, in the absence of immediate and clear connections between SEL programming and academic outcomes, schools would likely be reluctant to endorse such initiatives and view SEL as non-essential programming (Zins et al., 2004). Continued research demonstrating the link between SEL and learning outcomes as well as the benefits of integrating SEL programming with existing academic programming is needed to strengthen support for multi-tiered SEL among

educators and to increase the likelihood that evidence-based SEL programming will be fully enmeshed in the everyday practices and routines of schools.

Another barrier to the advancement of multi-tiered SEL programming has been the lack of normed and validated social-emotional assessment tools and procedures that are feasible and sustainable for use in schools (Dishion & Tipsord, 2011, Merrell & Gueldner, 2012; Nese et al., 2012; Tilly, 2008). Continued research is needed to better understand reliable, valid, and practical assessment procedures to assist schools in determining student need for social-emotional support and evaluating the effectiveness of SEL programming to improve outcomes for all students.

## The Present Study

Schools can play an important role in preventing problems and promoting healthy development by fostering not only academic skills but also social-emotional competence (Rones & Hoagwood, 2000; Weisz et al., 2005). Research supports the use of the MTSS model to effectively integrate school-based SEL intervention and assessment with preexisting academic practices to maximize school success for all students (Cook, Burns, Browning-Wright, & Gresham, 2010; Doll & Cummings, 2008; Domitrovich, Gest, Jones, Gill, & Derousie, 2010). Although the challenges associated with the implementation and sustainability of evidence-based practices in schools are well documented, there is little guidance in the literature on the integration of SEL practices within a tiered model of service delivery (Dishion, 2011; Domitrovich et al., 2010).

The purpose of this study was to address the need for more research examining the potential benefits of integrating social-emotional screening and primary prevention into an existing tiered model of educational programming. As such, this research examined whether the

addition of a universal social emotional learning (SEL) curriculum to a standard, academically focused tiered model of service delivery improved elementary students' social-emotional competence and academic performance.

# CHAPTER 2

# LITERATURE REVIEW

The purpose of this literature review is to establish the need for continued research relating to the integration of social emotional learning (SEL) and assessment into routine school practices. To that end, this chapter is subdivided into five sections. The first section defines social-emotional competence and its association with developmental and educational outcomes. The second section establishes the theoretical foundations that guide the research and support the inclusion of universal SEL programming in the school setting. A practice framework that informs the effective integration of SEL practices into the real-world context of classrooms and schools is also presented. The third section of the review highlights key findings linking school-based SEL programs to the development of core competencies, learning outcomes, and indicators of school success. Attention is devoted to examination of the research associated with *Second Step,* a school-based SEL intervention program designed to promote social-emotional competence. The fourth section presents key literature related to the valid and reliable assessment of social-emotional competence, with emphasis on the use of universal, strengths-based screening procedures within a tiered model of educational programming. The final section summarizes the literature review and situates the proposed study within the existing body of empirical literature relating to school-based SEL and its integration into existing frameworks of educational programming.

## Social and Emotional Competence and Student Outcomes

Children need a strong foundation in social-emotional competence to succeed in school (Raver, 2002). In the context of school-based SEL, social-emotional competence represents a student's overall ability to meet the social and emotional demands of the learning environment

(McClelland, Acock, & Morrison, 2006; Merrell & Gueldner, 2012). Social-emotional competence has been found to be reliable predictor of future academic performance and school success, even more so than prior academic performance (Malecki & Elliot, 2002). Social-emotional skills are said to operate in conjunction with cognitive skills to promote school success (Denham, Bassett, & Zinsser, 2012; DiPerna & Elliott, 1999; Flook, Repetti, & Ulman, 2005; Malecki & Elliott, 2002; Welsh, Parke, Widaman, & O'Neil, 2001; Wentzel, 1993). The SEL literature relies on a variety of overlapping social, behavioral, and affective constructs to describe the skills, attitudes, and knowledge that enable the development of social-emotional competence. The present study conceptualizes social-emotional skills according to the framework created by the Committee for Children (2012) and used in the development of the *Second Step* curriculum. From this framework, skills associated with social and emotional competence are organized into four categories: skills for learning, empathy, emotion management, and social problem solving. The four social-emotional skills of interest in the current study are defined below along with empirical support linking the skill to student outcomes and school success.

*Skills for learning* refers to the ability to apply executive function skills, specifically attention, working memory, and inhibitory control, to enhance engagement in the learning process and benefit from classroom instruction and experiences (Low, Cook, Smolkowski, & Buntain-Ricklefs, 2015; McClelland et al., 2006). Attention in this case refers to the ability to focus on a task or activity while ignoring extraneous factors that might inhibit engagement in the learning process (Barkley, 1997; Low et al., 2015). Working memory refers to the ability to remember and use information, such as a teacher's directions or multi-step procedures for solving a math problem (Demetriou, Christou, Spanoudis, & Platsidou, 2002; Low et al., 2015).

Inhibitory control, also referred to as effortful or impulse control, involves the ability to interrupt automatic but inappropriate responses or actions and enlist appropriate behaviors instead (Blair, 2002; Eisenberg et al., 2005; Raver & Knitzer, 2002; Low et al., 2015; Rennie, Bull, & Diamond, 2004). The proficient demonstration of skills for learning in elementary school has been found to predict academic success and fewer behavior problems in the future (Blair & Razza, 2007; Duncan et al., 2007; Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006; Howse, Lange, Farran, & Boyles, 2003; Kroesbergen, Van Luit, Van Lieshout, Van Loosbroek, & Vande Rijit, 2009; McClelland et al., 2006; Ponitz, McClelland, Matthews, & Morrison, 2009; Vitaro, Brendgen, Larose, & Tremblay, 2005).

*Empathy* refers to the ability to identify, understand, and respond in a caring way to how someone else is feeling (Cohen & Strayer, 1996; Jolliffe & Farrington, 2004; Low et al., 2015). The perspective-taking, interpersonal skills associated with empathy provide the critical foundation for socially responsible behavior, friendships, cooperation, and social problem solving (Mayer & Salovery, 1997; Saarni, 1997). Children who demonstrate higher levels of empathy are more accepted by peers (Crick & Dodge, 1994; Fabes et al., 1994; Denham, McKinley, Couchoud, & Holt, 1990; Izard et al., 2001), better prepared for school (Raver & Knitzer, 2002), less likely to be aggressive towards peers (Arsenio, Cooperman, & Lover, 2000; Kaukiainen et al., 1999), and enjoy greater academic success than students with lower skills in this area (Katsurada & Sugawara, 1998; Wentzel, 1991, 1993).

*Emotion management* involves the ability to understand, monitor and manage emotions, thoughts, and behaviors (Barkley, 2004; Eisenberg, Cumberland, & Spinrad, 1998; McClelland et al., 2006; Raver & Knitzer, 2002). Specifically, children with strong emotion management skills have the capacity to recognize strong feelings and use self-calming strategies to

successfully manage strong emotions. Emotion management is positively linked to young children's school transition, cognitive competence, and social functioning (Garner & Waajid, 2012; Raver & Knitzer, 2002). The ability to manage emotions effectively is also linked to decreased levels of aggression and substance abuse (Brady, Myrick, & McElroy, 1998; Underwood, Coie, & Herbsman, 1992; Vitaro, Ferland, Jacques, & Ladouceur, 1998) as well as improvements in self-control and effective problem solving (Donohew et al., 2000; Greenberg, Kusche, Cook, & Quamma, 1995; Simons, Carey, & Gaher, 2004). Students who struggle with emotion management, on the other hand, are more likely to demonstrate socially unacceptable behavior, lower academic self-concept, more internalizing behaviors, and gain less peer acceptance than children who can successfully manage their emotions (Eisenberg, Fabes, & Losoya, 1997; Flook et al., 2005).

*Problem solving* refers to the ability to effectively handle personal challenges and interpersonal conflicts and make socially responsible decisions (Hawkins, Farrington, & Catalano, 1998; Shure & Spivack, 1980, 1982; Tolan & Guerra, 1994). Problem solving skills are a critical component of social-emotional competence, relying largely on communication skills to generate and select potentially effective strategies for coping with problematic social situations (Elias & Tobias, 1996). Effective problem solving skills are linked to a reduction in impulsive behavior, improvements in social adjustment, and avoidance of violence and other negative social behaviors (Flook et al., 2005).

## A Framework for School-Based Social Emotional Learning

Social emotional learning (SEL) is defined as the process by which children "learn to recognize and manage emotions, care about others, make good decisions, behave ethically and responsibly, develop positive relationships, and avoid negative behaviors" (Zins et al., 2004).

SEL is a broad term that encompasses a variety of techniques to help individuals develop competencies and acquire knowledge to optimize school and life success (CASEL, 2003; Elias, Parker, & Rosenblatt, 2005; Greenberg et al., 2003). It has been posited that universal, school-based efforts to promote SEL represent a promising approach to preventing behavioral difficulties and enhancing student success and overall well-being (Elias et al., 1997; Zins & Elias, 2006). School-based SEL is based on the premise that social-emotional skills are malleable and can be developed and reinforced through direct instruction and enhancement of the classroom environment (Elias et al., 1997; Greenberg et al., 2003; Zins & Elias, 2006; Zins et al., 2004).

The present study was guided by the SEL conceptual framework set forth by the Collaborative for Academic, Social and Emotional Learning (CASEL). CASEL, a national collaborative of consultants and experts in social and emotional development, was created in 1994 with the mission of making evidence-based SEL an integral part of all students' formal education through high school. The framework provided a useful perspective for examining the potential benefits of fostering social-emotional competence in the school setting. The conceptual model is grounded in developmental research and prevention science, relying heavily on the work of Zins and colleagues (2004), CASEL (2013), and Rimm-Kaufman et al. (2014), to describe how school-based SEL intervention improves social, emotional, and academic performance. From the CASEL framework, school-based SEL programs involve two core components that serve as the "active ingredients" in the promotion of cognitive, affective, and behavioral competencies: 1) direct instruction in processing, integrating, and selectively applying social-emotional skills; and 2) establishment of safe, caring learning environments. According to the conceptual framework, school-based SEL programs provide students with

direct instruction in social-emotional skills and establish safe learning environment, leading to immediate improvements in the classroom social environment (e.g., teacher shows greater emotional responsiveness to students, enhanced classroom management) and students' social-emotional skills (e.g., emotional, interpersonal, cognitive, self-skills). These core intervention components, along with the immediate improvements associated with participation in the intervention, are thought to be the mechanisms through which more distal, or long-term, improvements in social, emotional, and academic performance are realized (Rimm-Kaufman & Hulleman, 2015). From this conceptualization, short-term improvements in students' social-emotional skills support the ability to pay attention and follow instructions, eventually leading to more distal improvements in school success. Similarly, the more immediate development of problem-solving and emotional-management skills leads to a reduction of disruptive behavior and, thus, frees up time for academics and eventually leads to improvements in academic performance. Explicit instruction in social-emotional skills, the intervention "active ingredient", initially ameliorates intense emotions (e.g., anxiety, anger) that can interfere with cognition, ultimately leading to long-term improvements in both school and life success. Figure 2 illustrates this conceptual framework.

As social-emotional competencies are considered foundational to healthy development across the life span, many scholars posit that school-based SEL programming best serves students when situated within a multi-tiered prevention and intervention framework based on the public health model (Bradshaw, Bottiani, Osher, & Sugai, 2014; Nastasi, Moore, & Varjas, 2004; Ysseldyke et al., 2006). From this approach, school-based SEL programming at the universal or primary level involves teaching social-emotional skills to all students through universal programming with attention to such ecological factors as effective instructional practices,

supportive relationships, high expectations, and safe learning environments (Osher et al., 2008). For effective implementation of this model to occur, however, schools need access to evidence-based intervention and assessment tools that can be feasibly and reliably transported to the real world setting of the classroom.

## School-Based SEL Intervention and Outcomes

The mounting evidence linking social-emotional competence to learning outcomes, along with the escalation of emotional and behavioral problems in the school setting, has prompted the development and dissemination of numerous prevention and intervention programs aimed at promoting school-based SEL. School-based SEL programs are designed to foster the development of competencies that provide the foundation for positive social-emotional adjustment and academic performance (CASEL, 2003). A large volume of published studies has examined the connection between school-based SEL and improvements in student social-emotional competence, school success and overall well-being. Several meta-analyses and large-scale reviews have synthesized this extensive body of literature, establishing the empirical foundation that links school-based SEL intervention and positive social-emotional, behavioral, and learning outcomes (e.g., Durlak et al., 2011; Durlak & Wells, 1997; Greenberg, Domitrovich, & Bumbarger, 2001; Payton et al., 2008; Zins et al., 2004).

### Effect of School-Based SEL on Student Outcomes

In a large-scale analysis and discussion of the SEL literature, Durlak et al., (2011) investigated the effects of 213 school-based universal SEL programs on kindergarten through high school students' (n = 270,034) school outcomes. The meta-analysis included only published studies that focused on SEL skills, targeted students between the ages of five and eighteen without an identified disability, included a control group and provided enough information to

calculate effect sizes. Student outcomes were grouped into six categories: (1) social-emotional skills, (2) attitudes toward self, school, and others, (3) positive, social behaviors, (4) conduct problems, (5) emotional distress, and (6) school performance. Results of the meta-analysis demonstrated significant improvements in all outcome measures of interest for students receiving SEL intervention compared to control group peers not participating in such programming. Intervention students were found to experience improvements in social-emotional skills ($g$ = 0.57), attitudes towards themselves and others ($g$ = 0.23), positive social behaviors ($g$ = 0.24), conduct problems ($g$ = 0.22) and emotional distress ($g$ = 0.24). A link between SEL program participation and higher academic scores was also found ($g$ = 0.27).

It is important to note that, although the *social-emotional skills* outcome category included a broad range of related outcomes (e.g., emotional self-awareness, coping with stress, resolving conflict, and resisting unwanted peer pressure), assessments were based on student, teacher, parent, or independent ratings completed in structured or test situations. *Positive social behaviors*, on the other hand, included emotion management, positive social interaction, cooperation, leadership, problem-solving, and social assertiveness, as reflected in daily classroom behavior rather than hypothetical or test situations (Durlak et al., 2011; Payton et al., 2008). Therefore, the more robust effect size ($g$ = 0.57) found for *social-emotional skills* reflects demonstration of skills on a contrived task in a testing setting that likely varied significantly from authentic classroom tasks in the actual classroom setting. When looking to understand the benefits of participation in SEL intervention on students' daily application of social-emotional skills in the classroom as conceptualized in this study, the *positive social behaviors* outcome is likely a better indicator.

In another large-scale review and analysis of prevention programs, Payton et al., (2008) summarized the findings from three reviews of different types of SEL programs: (a) universal, school-based SEL interventions, (b) intervention programming for students displaying early signs of behavioral and emotional problems, and (c) after-school programs. Whereas Durlak et al. (2011) included students between the ages of five and eighteen in their analysis, Payton and colleagues (2008) included only studies targeting kindergarten through eighth-grade students (n = 324,303). All other study inclusion criteria as well as student outcome categories were the same across the two large-scale reviews. As with the Durlak and colleagues (2011) results, Payton et al. (2008), found positive effects for students participating in school-based SEL programs (n = 180) across the six outcomes of interest compared to control students. Students receiving school-based SEL intervention demonstrated increased social-emotional skills ($g$ = 0.60), higher academic performance ($g$ = 0.28), enhanced attitudes towards self and others ($g$ = 0.23) and increased positive social behavior ($g$ = 0.24). SEL program participation was also linked to decreases in conduct problems ($g$ = 0.23) and emotional distress ($g$ = 0.23) compared to students not receiving intervention.

Interpreting the Effects of School-Based SEL

Although findings from the two large-scale analyses discussed above (Durkin et al., 2011; Payton et al., 2008) indicate that SEL programs generally result in small effect sizes, the authors argue that the application of Cohen's (1988) standard conventions for determining the magnitude of effects may not be appropriate in the study and evaluation of school-based SEL intervention. Instead, the researchers advocate for interpretation within the context of previous, related research with an emphasis on the practical value of indicated program effects (Durlak, 2009; Hill, Bloom, Black, & Lipsey, 2008). Interpreted in this way, the SEL programs included

in the Durlak et al. (2011) analysis were found to yield results similar to or, in some cases, higher than those achieved by other psychosocial and educational interventions. To highlight this point, the authors emphasize that the mean effect size for academic achievement ($g = 0.27$) found in their analysis was comparable to the results of 76 meta-analyses of strictly educational interventions (Hill et al., 2007). According to this line of reasoning, when placed in the context of previous research, meta-analysis findings offers strong support that school-based SEL programs are among the most successful interventions offered to school-aged youth.

Also, emphasizing the practical value of seemingly modest effect sizes, Payton and colleagues (2008) translated program effects into improvement indices to show percentile gains achieved by the average student in an SEL intervention class compared to the average student in a control class. The authors reported improvement indices ranging from 9 to 10 percentile points in positive attitudes and social behaviors, conduct problems, and emotional distress; 11 percentile points in academic performance; and 23 percentile points in social-emotional skills. According to the authors, improvement indices provide a better indication of the practical value of improvements in student outcomes than effect size alone (Payton et al., 2008).

Differential Effects: Who Reaps the Benefits?

One noted limitation in the empirical literature examining the effects of school-based SEL intervention is the failure in many research studies to report student demographic data (e.g., race/ethnicity, SES, age/grade, gender; Durlak et al. 2011, Payton et al., 2008). In the review of school-based SEL programs conducted by Payton et al., such data were so limited that the authors were unable to report differential effects across participant demographics. Noting a similar omission of demographic data, Durlak et al. (2011) analyzed the differential effects by school's geographic location, student ethnicity, and students' mean age across a subset of studies

that included the information. Durlak and colleagues found significant effects for only one demographic characteristic on one of the six outcome categories: students' mean age significantly and negatively related to social-emotional skills (*rs* = -.27). In other words, students' social-emotional skills tended to decrease with age. Again, it should be noted that the negative effects of age were found on students' demonstration of social-emotional skills on a contrived task in a testing setting, as opposed to daily application of skills in the classroom.

Neither Durlak et al. (2011) or Payton and colleagues (2008) reported a moderating effect of gender relating to SEL intervention. A review of the broader social-emotional competence literature revealed, however, that several published studies found that girls demonstrate more positive emotion, emotional regulation, emotion knowledge, and overall social emotional competence than boys (Bosacki & Moore, 2004; Brown & Dunn, 1996; Else-Quest et al., 2006; Garner & Waajid, 2012; Merrell, Cohn, & Tom, 2011). These social-emotional advantages, however, were not consistently translated to girls realizing more benefit from participation in SEL intervention compared to boys. For instance, SEL programs have been found to be more effective for boys in decreasing indirect aggression, increasing prosocial behavior, and interrupting a decline in social-emotional skills (Aber, Jones, Brown, Chaudry, & Samples, 1998; Belfield, Nores, Barnett, & Schweinhart, 2006; Miller, Malone, & Dodge, 2010; Muenning, Schweinhart, Montie, & Neidell, 2008; Frey, Nolen, Estrom, & Hirschstein, 2005). Research suggests that, although girls may demonstrate better social-emotional competence than boys, boys and girls do not similarly benefit from participation in SEL programming. It may be the case that girls have less to gain from SEL intervention than boys, as they on average demonstrate higher levels of social-emotional competence. Emerging research indicating that the

positive effects of SEL intervention are most pronounced for children with lower baseline competencies seems to support this claim (e.g., Frey et al., 2005; Low et al., 2015).

Delivery Matters: Teacher vs. Non-School Personnel

Large-scale analysis and review of school-based SEL programs demonstrate that school personnel can effectively implement SEL programs to improve student behavior, attitudes toward school, and academic achievement (Durlak et al., 2011; Payton et al., 2008). In their meta-analysis of universal SEL programs, Durlak and colleagues (2011) compared the effectiveness of classroom-based intervention delivered by teachers versus non-school personnel (e.g., researchers, community-based workers). Teacher-delivered SEL intervention was found to result in positive mean effects in all six of the student outcomes categories: SEL skills (g = .62), attitudes (g= .23), positive social behavior (g = .26), conduct problems (g = .20), emotional distress (g = .25), and academic performance (g = .34). SEL interventions delivered by non-school personnel, on the other hand, resulted in positive mean effects for only three of the outcome measures: SEL skills (g = .87), attitudes (g= .14), and conduct problems (g = .17).

Payton et al. (2008) similarly compared the effectiveness of interventions' delivery mode. Results indicated even stronger main effects for teacher-delivered interventions than reported in the Durlak et al., (2011) comparison, with teacher-delivered interventions again resulting in positive mean effects for all outcome measures (SEL skills, *g* = .68; Attitudes, *g* = .24; Positive social behavior, *g* = .27; Conduct problems, *g* = .21; Emotional distress, *g* = .23; Academic performance, *g* = .43) while non-school personnel-delivered programs demonstrated effectiveness for only two of the outcomes (SEL skills, *g* = .84; Conduct problems, *g* = .17). One important finding to note in the two large-scale comparisons is that participation in classroom-based SEL interventions resulted in significant improvements in academic performance only

when delivered by teachers as opposed to non-school personnel (Durlak et al., 2011). These results provide strong evidence that, not only is it feasible for school staff to implement SEL programs, teachers are more effective at delivering the programs than non-school personnel and are the only implementers likely to generate improvements in student academic performance (Durlak et al., 2011; Payton et al., 2008).

## Evidence-Based SEL: *Second Step*

Among the many school-based SEL programs available, *Second Step* (Committee for Children, 2012) is one of the most widely disseminated and nationally recognized. Several research studies have evaluated the efficacy and effectiveness of *Second Step* on improving elementary students' social-emotional competence and reducing problem behaviors. One seminal, large-scale, randomized controlled trial examined the effect of *Second Step* on second- and third-grade students' (n=790) level of aggression and positive social behavior in six urban schools (Grossman, 1997). Direct observation revealed a significant increase in prosocial behavior and a significant reduction in physically violent behavior among students receiving *Second Step* intervention. During the same time, students not participating in the program showed increases in aggression at school and no appreciable changes in prosocial behavior. These findings suggest that the skills students develop through participation in *Second Step* not only improve observed prosocial behavior; the skills may also mitigate a normative increase in observed aggressive behavior associated with age as students progress through the school year.

Change in teacher-rated aggression and prosocial behavior, on the other hand, indicated no significant differences between intervention and control schools in targeted behaviors. Much of the incongruence between teacher ratings and direct observation, however, may be attributed to the way in which the direct behavior observation data were collected and coded. It is

important to note that observational data were collected in three different settings: classroom, playground, and cafeteria. Significant differences in behavioral changes between intervention and control schools were only observed on the playground and in the cafeteria; directly observed classroom behaviors did not reveal significant differences. As teacher ratings of student behavior are based primarily on classroom observations, direct observation (in classroom setting) and teacher-ratings of student behavior were consistent; both sources indicated that students receiving *Second Step* intervention did not demonstrate significant differences in prosocial and aggressive behavior in the classroom setting compared to students not receiving the program.

Another important factor to consider when interpreting the results of the Grossman (1997) study is the method used for coding prosocial behavior. Because observers had difficulty distinguishing between prosocial and neutral behaviors in the field, the two types were collapsed into one category (neutral/prosocial) for analysis and interpretation. As such, the reported gains in prosocial behavior on the playground and in the cafeteria for students receiving *Second Step* include an unknown proportion of neutral behavior. As neutral behavior is not defined in the study report, it could be that reported increases in prosocial behavior included observation of withdrawal, social isolation, disengagement, or passivity, all of which would not be considered a developmental asset that would promote student success. Overall, these findings offer support for *Second Step's* effectiveness in reducing aggressive behavior in school settings that are less structured and more prone to problem behaviors (i.e., playground, cafeteria). Results did not reveal, however, that *Second Step* was effective in promoting prosocial skills or reducing problem behaviors in the classroom setting, a context of importance in the proposed study due to the close link between student classroom behavior and school outcomes.

A second randomized controlled trial of *Second Step* involving second- through fourth-grade students (n = 1,253) in fifteen elementary schools examined program effects on student social competence and antisocial behavior (Frey et al., 2005). Unlike Grossman's (1997) findings, Frey and colleagues found significant differences in teacher-rated social behavior among students participating in *Second Step* and control students. Students in the *Second Step* group showed significant gains in social competence relative to students in the control group (partial $\eta^2 = .20$). Teacher ratings of antisocial behavior also significantly decreased for students in the intervention group while antisocial behavior increased for control students during the same time. Decreases in antisocial behavior were particularly meaningful for students rated by their teachers as highly antisocial at baseline (one or more SD above the mean; $\eta^2 = .25$). Intervention students initially rated as lower in antisocial behavior (less than one SD above the mean) also saw greater reductions in antisocial behavior compared to the control group, although these differences were not as pronounced as students rated as highly antisocial ($\eta^2 = .17$). Like the observational results in the Grossman (1997) study, these findings suggest that the skills students develop through participation in *Second Step* not only improve observed prosocial behavior; the skills may also mitigate a normative increase in observed aggressive behavior associated with age and the progression of the school year.

In addition to teacher ratings of student social behavior, Frey et al. (2005) used direct observation during a structured conflict to measure student social behavior. The conflict situations used in the study were designed to elicit competition or cooperation over the distribution of resources. Students receiving *Second Step* were less likely to need adult assistance to negotiate a resolution with peers, requiring 41% fewer adult interventions than students in the control group. *Second Step* participants also demonstrated significantly less aggression when

negotiating for prizes than students in the control group ($\eta^2 = .14$). Program effects were not observed, however, for other social behaviors such as cooperation, motivation, or subtle coercive behavior (e.g., "power plays").

Overall, findings from the study are promising and suggest that *Second Step* can promote social-emotional competence and reduce problem behavior in the classroom as rated by teachers. Although observational results demonstrate potential program benefits, observed improvements in student social competence occurred outside of an authentic classroom setting and are based on behavioral response to a contrived social problem. As with Grossman's (1997) findings suggesting *Second Step*'s positive effects on observed playground and cafeteria behavior, it is difficult to predict how the observed increases in social competence during a structured conflict would transfer to the real world setting of the classroom environment. These results also align with large-scale review of school-based SEL interventions indicating robust effects in the promotion of social-emotional skills yet, to a lesser degree, of effectiveness in increasing prosocial behaviors in the classroom (Durlak et al., 2011; Payton et al., 2008).

Taken together, these results illustrate a prominent critique of tiered models of service delivery set forth in the SEL literature, that social-emotional and academic programming often represent disconnected systems and the failure to integrate programming compromises the degree to which students benefit from instruction and intervention (Lane & Menzies, 2003; McIntosh et al., 2006; Zins et al., 2004). The benefits of such an integrated approach are supported by findings from large-scale reviews indicating that, compared to non-school personnel-delivered interventions, teacher-delivered interventions are significantly more effective across a wider range of student outcomes (Durlak et al., 2011; Payton et al., 2008). Presumably, the stronger effects of teacher-delivered interventions might be explained by the

greater likelihood that intervention content and skills are introduced, reinforced, and integrated throughout the school day in the actual classroom setting during authentic learning activities. Non-school personnel-delivered interventions, on the other hand, are more likely to be disconnected from the everyday functioning of the classroom and curriculum with fewer opportunities to apply emerging skills to authentic settings and learning activities resulting in weaker effects on behavior in the classroom setting.

A small-scale study investigated the effect of one school's implementation of *Second Step* on third- through fifth-grade students' ($n$ = 54) social behavior relative to same-grade peers attending a comparison school ($n$ = 33) and not receiving SEL intervention (Taub, 2001). Using the School Social Behavior Scales (SSBS; Merrell, 1993), students in the *Second Step* school were rated by teachers as significantly lower on the social competence scale than students in the comparison school prior to intervention. However, one year following intervention, students at both schools were rated similarly as a result of significant improvements in social-emotional competence for students receiving the *Second Step* intervention. These results suggest that, in addition to serving a preventative role by bolstering social-emotional competence for all students, *Second Step* may also be effective in remediating skills for students starting the year behind peers in social-emotional competence.

Teacher ratings also indicated a significant time by school effect on the SSBS antisocial behavior scale attributed to the combined effects of a slight decrease in antisocial behavior at the *Second Step* school and an increase in antisocial behavior at the comparison school. These results are consistent with other studies indicating the mitigating effect of *Second Step* on age-related increases in negative school behavior (Frey et al., 2005; Grossman, 1997). Although results from teacher ratings of antisocial behavior revealed a statistically significant group by time interaction

effect in favor of intervention students from baseline to one-year follow up, this change was considerably smaller and less predictable than change in social-emotional competence ratings. The differential effect of the intervention on social competence and antisocial behavior is consistent with other research findings, lending further support for the effectiveness of SEL intervention in developing new prosocial skills and, to a lesser degree, eliminating antisocial behaviors. The Taub (2001) study also included individual observation of four prosocial behaviors in the classroom setting: *engages appropriately with peers, follows directions from adults, follows classroom rules, bothers/annoys other students*. Results revealed statistically significant treatment effects for only one of the observed behaviors at the one-year follow up. Overall, intervention students demonstrated greater improvement in *follows directions from adults* from baseline to one-year follow up compared to control students. These results are consistent with other *Second Step* studies that found weak or nonexistent effects in direct observation of students' classroom behavior (Frey et al., 2005; Low et al., 2015). It could be that change in observed behaviors is more difficult to demonstrate due to the limited time observers spend in the classroom in contrast to teachers who have daily interaction with students over many months.

A recent large-scale, randomized-control trial investigated whether early elementary students (n = 7,300) receiving the updated version of *Second Step* (Committee for Children, 2012) performed better on social and behavioral outcomes than students in comparison schools (Low, Cook, Smolkowski, & Buntain-Ricklefs, 2015). Sixty-one schools within two different states were matched on free and reduced lunch and percent of non-White students and included in the study. Outcome measures included teacher ratings of student behavior using the Devereux Student Strengths Assessment – Second Step Edition (DESSA-SSE; LeBuffe, Naglieri, &

Shapiro, 2011), teacher ratings of behavior using the Strengths Difficulties Questionnaire (SDQ; Goodman, 2001), and direct observation of disruptive behavior in the classroom. In order to evaluate the effectiveness of *Second Step* under real-world educational conditions, the study maintained little research control. The intervention was delivered by classroom teachers and relied on limited training and research involvement. Results suggest significant group differences from pretest to posttest on only two of the eleven outcomes tested. Students in *Second Step* schools showed greater improvements in teacher-rated skills for learning on the DESSA-SSE ($g$ = .11) and greater reduction in SDQ emotional problems ($g$ = -.10) as compared to students in control schools over a one-year period. Consistent with other studies, program effects on direct observation of student disruptive behavior in the classroom did not reach statistical significance (Frey et al., 2005; Taub, 2001).

The researchers also tested whether students' response to *Second Step* varied by baseline social-emotional competence scores. Tests of moderation indicated that *Second Step* produced significant improvements in eight of the eleven social-emotional and behavioral outcomes for students who started the school year with skill deficits relative to their peers. Specifically, students demonstrating higher levels of problem behaviors at baseline showed a significant decrease in teacher-rated conduct problems, hyperactivity, and peer problems following intervention. Students demonstrating deficit social-emotional skills prior to intervention also realized significant improvements in skills for learning, emotional management, problem solving, and overall social-emotional competence following participation in *Second Step* intervention. However, these effects were specific to children who were generally in the lower half of their peers (50$^{th}$ percentile). Echoing Taub's (2001) findings, results suggest that the benefits of *Second Step* are most pronounced for children with lower baseline competencies at

the beginning of the school year. This pattern suggests that the expectation of main effects across all students may be unrealistic and that a certain subgroup of participants may not demonstrate the benefits of SEL programming, as they already possess a high level of social-emotional competence at baseline. Analysis that relies solely on testing for main effects runs the risk of masking differential effectiveness, suggesting the importance of moderation analyses to better understand the types of students who are most responsive to school-based SEL intervention such as *Second Step*. As with skills in the academic domain, it can be expected that students will begin the school year with variable levels of social-emotional skills and will likely respond differently to intervention. This pattern lends support for the integration of universal SEL screening to identify those students in need of additional social-emotional support and to assess student response to universal SEL intervention.

Overall, the research on *Second Step* reveals inconsistent improvements in student outcomes that vary widely depending on measurement procedures, outcomes of interest, and student characteristics. The most consistent pattern across studies indicates that the benefits of *Second Step* are most pronounced for children beginning the school year with lower baseline social-emotional competencies, suggesting that all children do not benefit similarly from participation in the *Second Step* program. Differential effects of gender, grade, or ethnicity, however, were not indicated.

## Measuring Social Emotional Competence in School

Assessment of social-emotional competence is necessary in order for schools to make data-based decisions regarding the effectiveness of SEL programming for individual students, classrooms, and the student body as a whole. Assessment measures and procedures also play an important role in the early identification of students in need of additional social-emotional

support and to determine the level or intensity of programming will most appropriately address the identified needs (Merrell, Juskelis, Tran, & Buchanan, 2008). The development and widespread dissemination of valid and reliable tools to support the school-based screening, assessment, and progress monitoring of social and emotional competence, however, lags behind assessment in academic domains. Often educators have been left with little choice but to rely on traditional tools and procedures that are not necessarily aligned with current SEL theory and best practice. For example, such misaligned assessment methods might include lengthy rating scales designed for diagnostic purposes, office discipline referrals or school suspensions/expulsions that focus on severe levels of maladaptive behavior, and teacher anecdotal reports that lack a quantifiable and objective base from which to make defensible date-driven decisions. This mismatch between social-emotional and behavioral assessment practices and the current theory and practices that drive evidence-based prevention programs presents a significant barrier to the transportability and effectiveness of SEL programming in schools.

In response to a growing interest in school-based SEL, a variety of packaged curricula have been developed to support development of students' social-emotional competence. Unfortunately, the development of SEL curricula has outpaced the development of assessment tools to measure social-emotional competence (Merrell & Gueldner, 2012). Amidst this landscape of newly developed SEL programs, each with varying degrees of empirical evidence, the challenges associated with the transportability and sustainability of evidence-based programs in the real world context of classrooms and schools is well documented. Effective program implementation within a multi-tiered framework is seen as a complex and iterative process that relies heavily on a data-driven decision-making system to ensure that the system is meeting the needs of all the students that it serves (Merrell & Gueldner, 2012). Until recently, a lack of

normed and validated social-emotional assessment tools posed a significant barrier to the advancement of a multi-tiered framework for school mental health and SEL programming (Nese et al., 2012; Tilly, 2008). Fortunately, several school-based assessments have recently been developed and are beginning to make their way into schools and multi-tiered systems of program delivery (e. g., Merrell et al., 2011; LeBuffe, Ross, Fleming, & Naglieri, 2013).

## Strengths-Based Assessment

The importance of identifying and building upon strengths has been an important feature of many educational models (Merrell, Ervin, & Peacock, 2012; Tilly, 2008). Yet, social-emotional assessment practices have traditionally focused on the identification of problems rather than competencies and strengths (Merrell & Gueldner, 2010). The dual-factor model of mental health posits that wellness is comprised of more than the mere absence of pathology, and that students who demonstrate complete mental health (the absence of significant problem symptoms and the presence of protective indicators) fare better on a variety of academic and life outcomes (Adelman & Taylor, 2003; Suldo & Shaffer, 2008). Particularly relevant to strength-based assessment is the notion that assessment informs intervention aimed at increasing students' competencies (Batsche et al., 2008). Several features of strength-based assessment align with the theoretical and empirical foundation that guides the integration of SEL programming into the everyday practices and routines of schools. For example, strength-based assessment provides information about students' social-emotional competencies and skills, holding particular promise for the evaluation of SEL interventions that target increases in skills and competencies (Batsche et al, 2008). Strengths-based measures also focus on behaviors and skills associated with resilience and have been shown to be predictive of later developmental outcomes (Hjemdal, Friborg, Stiles, Rosenvinge, & Martinussen, 2006).

Teacher Ratings of Social and Academic Behavior

Although behavior-rating scales are one of the most commonly used measures of social-emotional behavior, such measures were traditionally developed for diagnostic purposes (i.e., measuring existing symptoms against a diagnosable disorder) rather than for identifying future risk or response to intervention (Albers, Glover, & Kratochwill, 2007). In particular, behavior rating scales have generally been comprised of negative items that provide limited information about desirable behaviors and assets and even less utility when looking to monitor student progress toward acquiring skills and competencies (Hosp, Howell, & Hosp, 2003). Social, emotional, and behavioral assessment practices stand to benefit from the inclusion of positive assets and other indicators of wellness. For social-emotional assessment practices to positively affect students and educational systems, these assessments need to be integrally linked to the creation and implementation of effective interventions.

One approach to social-emotional assessment that has generated increasing practical and empirical support is the use of teacher ratings of student competence on a common set of social-emotional or behavioral criteria. Strengths-based teacher ratings of student social-emotional competence have been found to be effective and represents an improvement over traditional processes that rely on spontaneous referral of students demonstrating behavioral or social-emotional problems by general education teachers (Severson, Walker, Hope-Doolittle, Kratochwill, & Gresham, 2007). The Devereux Student Strengths Assessment – Second Step Edition (DESSA-SSE; LeBuffe et al., 2011) represents one newly developed strengths-based measure that is integrally linked to SEL intervention. The DESSA-SSE is a 36-item, standardized, norm-referenced behavior rating scale that assesses the social-emotional competencies that serve as protective factors for children in kindergarten through the eighth

grade. The DESSA-SSE is organized into four conceptually derived scales that correspond to skills taught in the *Second Step* program. Along with the overall social-emotional competence composite (SEC; $n = 36$, $\alpha = 0.98$), the DESSA-SSE scales include skills for learning ($n = 9$, $\alpha = 0.95$), empathy ($n = 9$, $\alpha = 0.95$), emotion management ($n = 9$, $\alpha = 0.91$), and problem solving (n = 9, $\alpha = .94$). Given its strong psychometric characteristics, focus on student strengths, reasonable demands on time, and integral connection to specific SEL learning objectives, the DESSA-SSE represents a promising example of the shift in social-emotional assessment and the potential that such a tool might have in supporting student success.

## School-Based Universal Screening

School-based universal screening has been proposed as one method for early identification of both academic (VanDerHeyden, Witt, & Gilbertson, 2007) and social-emotional (Levitt, Saka, Romanelli, & Hoagwood, 2007) needs. The use of such procedures in the delivery of prevention and intervention services in schools has been supported by federal legislation (e.g., No Child Left Behind Act of 2001, Individuals with Disabilities Education Act of 2004) and endorsed by numerous professional organizations representing a variety of educational fields (e.g., President's Commission on Excellence in Special Education, the Council for Exceptional Children, the National Association of School Psychologists, the American Psychological Association, the National Association of State Directors of Special Education; Cook, Volpe, & Livanis, 2010).

Over the past two decades, the use of school-based universal screening for academic difficulty as part of multi-tiered model of service delivery, particularly in early literacy development, has become increasingly commonplace in elementary schools (Dowdy, Ritchey, and Kamphaus, 2010). For example, the Dynamic Indicators of Basic Early Literacy Skills

(DIBELS; Good and Kaminski, 2003) is commonly used to screen all primary elementary school students for early literacy problems and to monitor the development of early literacy skills toward benchmark goals. The practice of systematic and universal screening for social and emotional needs is rare in comparison to its prevalence in the academic domain, with less than 2% of schools estimated to routinely use such procedures to identify social-emotional needs and monitor development in this area (Romer and McIntosh, 2005). Many factors are posited to contribute to the lack of universal screening for social-emotional needs in schools. A key consideration is the lack of reliable, cost-effective tools that are practical for use in schools and among school professionals (Dowdy et al., 2010; Romer and McIntosh, 2005). To date, there are few short-form versions of strength-based measures well-suited for universal screening (e.g., Merrell et al., 2011; Naglieri, LeBuffe, & Shapiro, 2011; Prince-Embury, 2007) and research is needed to determine the utility of existing measures for universal screening purposes.

A myriad of considerations beyond the technical adequacy of an SEL screener affects a school's decision to adopt universal SEL screening procedures. One of the key issues in developing universal screening procedures is the need for brief, easy to use, and relatively inexpensive tools. The ease with which the screening procedures can be integrated into existing models of educational programming is also an important consideration when looking to enhance a system's capacity to make informed educational decisions within a data-driven, multi-tiered model (Weist, Rubin, Moore, Adelsheim, & Wrobel, 2007). Other pragmatic issues include the length of the assessments, monetary cost, and disruption to classroom functioning and instruction (Flanagan, Bierman, & Kam, 2003).

The strength-based Devereux Student Strengths Assessment-mini (DESSA-mini; Naglieri et al., 2011) represents one promising SEL universal screening measure that has been recently

developed for use in schools. The DESSA-mini has demonstrated high internal consistency (α = .92), parallel form reliability (α = .90-.93), test-retest reliability (α = .88 - .94), and interrater reliability (α = .70-.81; Naglieri et al., 2011). The brief measure (8 items) requires limited investment of time; a teacher can feasibly rate all students in a class during one 50-minute planning period. The DESSA-mini produces a total scale score that is qualified by one of three descriptive levels (strength, typical, need for instruction). The DESSA-mini generates assessment data that are designed for ease of interpretation and integration with standard academic methods that categorize students into level of risk within a tiered model of educational programming. Given its psychometric soundness, ease of interpretation, progress monitoring potential, and alignment with data-based decision making that occurs within a tiered model of educational programming, the DESSA-mini is a promising tool to address the need for effective and efficient universal screening for social and emotional development in the school setting.

## Research Questions & Hypotheses

The purpose of this study was to take initial steps in exploring the potential benefits of integrating school-based SEL intervention into a tiered approach to educational programming. As such, this project evaluated the effects of a universal SEL intervention on elementary students' social-emotional competence and academic performance. This study also aimed to better understand for whom SEL programming produced immediate and secondary effects by examining the moderating effect of student gender and baseline level of learning risk on response to SEL intervention. The study addressed the following research questions and hypotheses:

RQ1: Controlling for baseline social-emotional competence, do students receiving *Second Step* intervention show greater improvement in social-emotional competence (skills for learning, empathy, emotion management, problem solving) than students in a

wait-list comparison group? If so, do improvements in social-emotional competence depend on student level of learning risk at baseline? Are intervention effects moderated by gender?

*Hypothesis 1a:* It was hypothesized that students receiving *Second Step* would show greater improvements in the combination of social-emotional competencies than students in a wait-list comparison group. This hypothesis is consistent with prior research on the immediate positive effects of school-based SEL programming and the anticipated outcomes produced by *Second Step*. This hypothesis was predicated on the idea that social-emotional competence can be taught and enhanced through integration of explicit SEL instruction with everyday classroom practices and academic curriculum.

*Hypothesis 1b:* Students demonstrating a higher level of learning risk at baseline would show greater improvements in social-emotional competence following intervention than students demonstrating lower learning risk. This hypothesis was based on prior research suggesting that the benefits of *Second Step* are greatest for students with lower baseline competencies. Analysis tested the interdependence of social-emotional competence and academic success and whether the level of learning risk at baseline moderated the effects of the intervention. It was hypothesized that students demonstrating higher levels of learner risk at baseline would show greater benefits from *Second Step* participation.

*Hypothesis 1c:* The effects of *Second Step* would be moderated by gender, with boys benefiting more from participation in SEL programming than girls. This hypothesis is consistent with prior research suggesting that girls demonstrate higher

levels of social-emotional competence than boys and that the positive effects of SEL intervention are most pronounced for students with lower baseline competencies.

RQ2: Controlling for baseline achievement, do students receiving *Second Step* intervention show greater improvement in academic achievement than students in a wait-list comparison group? If so, do improvements in reading achievement depend on student level of learning risk at baseline? Are intervention effects moderated by gender?

*Hypothesis 2a:* Students receiving *Second Step* intervention would show greater improvement in reading and math achievement than students in a wait-list comparison group. This hypothesis is consistent with prior research on the positive effects of teacher-delivered, school-based SEL programming on academic achievement. As illustrated in Figure 2, this hypothesis was predicated on the idea that social-emotional competence and academic achievement are interconnected and SEL programming not only promotes social-emotional skills, it also improves academic outcomes.

*Hypothesis 2b:* Students demonstrating a higher level of learning risk at baseline would show greater improvements in reading achievement than students demonstrating lower learning risk. This hypothesis is consistent with prior research suggesting that the positive effects of SEL intervention are most pronounced for students with lower baseline competencies. The hypothesis tested the interdependence of social-emotional competence and academic success and whether the level of learning risk at baseline moderated the effects of the intervention on reading achievement.

*Hypothesis 2c:* The effects of *Second Step* on reading and math achievement will be moderated by gender, with boys benefiting more from participation in SEL programming than girls. This hypothesis is consistent with prior research suggesting that girls demonstrate higher levels of social-emotional competence than boys and that the positive effects of SEL intervention are most pronounced for students with lower baseline competencies.

# CHAPTER 3

# METHOD

The purpose of this study was to evaluate the potential benefits of integrating SEL primary prevention with a tiered approach to educational programming. The study involved a secondary analysis of extant data to evaluate the effect of one school's implementation of universal SEL programming on elementary students' social-emotional competence and academic achievement. This chapter includes a description of the research design, characteristics of the existing dataset, and analysis procedures. Additionally, an overview of the *Second Step* curriculum is provided along with steps the school followed in delivery of the intervention and data collection.

## Design

This study is a retrospective investigation of one school's efforts to incorporate SEL primary prevention into an existing three-tiered model of academic programming during the 2014-2015 academic year. A nonequivalent group design with a pretest and posttest was used to study the effects of universal *Second Step* programming on student social-emotional competence and academic achievement. The Intervention condition represented a comprehensive approach to educational programming that combined social-emotional and academic interventions into a Multi-Tiered System of Support (MTSS) while the Wait-List Comparison condition represented a standard, academically focused Response to Intervention (RTI) framework. Students assigned to Wait-List Comparison classrooms received the *Second Step* curriculum during the second-half of the 2014-2015 academic year, after the Intervention group completed the program.

This study relied on existing demographic and student outcome data provided by the school district (program documentation, district database,) as well as public records of school

information (Public Schools Review, LLC, n.d.). The existing dataset included teacher ratings of student social-emotional competence collected at baseline and again following intervention implementation. Academic data collected during fall and winter benchmarking windows were also included in the school-provided dataset. A *Determination of Whether an Activity is Human Subject Research Form* was completed and submitted to the Michigan State University Institutional Review Board (IRB) in February 2016. The board determined that the federal regulations for the protection of human subjects did not apply to this research using existing data and IRB approval was not needed to proceed. IRB documentation is included in the Appendix. As the participating school district did not have a separate institutional review board, written authorization to use existing data for this study was sought and granted from the school administration in March 2016. After authorization was granted, the school research liaison consolidated data associated with the variables of interest for this study, stripped the dataset of all identifying information (e.g., name, birthdate), and provided the researcher with a de-identified dataset in Microsoft Excel format. School-provided demographic data included student gender, grade level, ethnicity, and classroom assignment (Intervention or Wait-List Comparison).

## Setting

This study involved secondary analysis of existing data from all students enrolled in one public school academy (PSA; commonly referred to as charter school) serving kindergarten through fifth-grade students. At the time of intervention implementation and data collection, the participating school had been in existence for 20 years under a charter contract authorized by a local public university. The school serves a neighborhood identified by city organizers as one of four at-risk neighborhoods targeted for a multi-year collaborative initiative. Determination of neighborhood risk was based on analysis of numerous early childhood indicators (e.g., maternal

and child health index, parent education, children living in poverty). Children residing in these identified neighborhoods were found to be at significant risk for negative school and health outcomes. At the time of data collection, the schools' population represented a demographic breakdown of 90.0% African American, 8.4% Hispanic, 1.1% White, and 0.5% American Indian. In addition, over 90% of students met the federal criteria of economic disadvantage as indicated by participation in the *Free and Reduced Price School Meals Program*. According to 2014-15 Michigan Student Test of Educational Progress (M-STEP) results, 19.1% of third graders, 11.7% of fourth graders, and 15.9% of fifth graders demonstrated proficiency in reading (kindergarten through second-grade students are not assessed on this measure; Michigan Department of Education).

Prior to the 2014-2015 academic year, the participating school approached instruction and service delivery from a standard, academic Response to Intervention (RTI) framework. Programming was designed to prevent academic difficulties through universal reading and math screening, regular monitoring of student academic progress, and a tiered system of increasingly intensive academic interventions. Under this application of the RTI model, a systematic framework for addressing the social and emotional needs of all students was not in place. Across the 2014-2015 academic year, the participating district implemented the more comprehensive, Multi-Tiered System of Supports (MTSS) by integrating universal SEL intervention with existing educational programming. Because intervention materials were limited, implementation of the SEL program took place in two phases across the 2014/2015 academic year. This study involved secondary analysis of existing school-collected data from the first phase of implementation.

## Classrooms and Teachers

During the 2014-2015 academic year, the participating school housed eighteen kindergarten through 5th-grade classrooms (three classrooms at each grade level), each staffed by a fulltime certified teacher. Administration and teaching staff assigned students to classrooms prior to the start of the school year per the school's standard practices (e.g., prior teacher recommendation, student strengths/needs). In August of 2014, after class rosters were finalized and distributed to teachers, school administration assigned all 18 classrooms to one of two conditions: Intervention or Wait-List Comparison. Teacher condition assignment was based on administrator recommendation and teacher willingness to be the first to implement the SEL program in his or her classroom (October – January). Initially, two classrooms from each grade level were assigned to the Intervention condition ($n$ = 12) and one classroom from each grade level was assigned to the Wait-List Comparison condition ($n$ = 6). However, during the fall data collection window, one fourth-grade Intervention classroom teacher resigned and a substitute teacher took over the classroom. The school principal decided that the classroom would receive the SEL program later in the school year, during the second phase of implementation. Although fall social-emotional competence data were eventually collected for these students after a long-term substitute teacher was in place for one month, intervention implementation had already begun and baseline data from that classroom were not included in the proposed study. As a result, data from 17 of the school's 18 classrooms were included in this study. Table 1 presents teacher gender, ethnicity, and grade level taught by condition.

During the first phase of implementation (October through January), the eleven Intervention classrooms received SEL programming along with the existing tiered academic programming. The Intervention condition, therefore, represented an integrated, Multi-tiered

System of Supports (MTSS) approach to service delivery. The Wait-List Comparison condition represented the existing, academically focused RTI approach to educational programming. Students assigned to Wait-List Comparison classrooms received the SEL intervention later in the school year (February through May) during the second phase of implementation.

Table 1

*Grade Level, Gender, and Ethnicity of Teachers (N = 17) by Intervention Group*

| Characteristic | *Second Step* Teachers *n* (%) | Comparison Teachers *n* (%) | Total Teachers *n* (%) |
|---|---|---|---|
| Grade Level | | | |
| Kindergarten | 2 (18%) | 1 (17%) | 3 (18%) |
| First | 2 (18%) | 1 (17%) | 3 (18%) |
| Second | 2 (18%) | 1 (17%) | 3 (18%) |
| Third | 2 (18%) | 1 (17%) | 3 (18%) |
| Fourth | 1 (9%) | 1 (17%) | 2 (12%) |
| Fifth | 2 (18%) | 1 (17%) | 3 (18%) |
| Total | 11 (100%) | 6 (100%) | 17 (100%) |
| Gender | | | |
| Female | 11 (100%) | 4 (67%) | 15 (88%) |
| Male | 0 (0%) | 2 (33%) | 2 (12%) |
| Ethnicity | | | |
| White | 9 (82%) | 2 (33%) | 11 (65%) |
| African American | 2 (18%) | 3 (50%) | 5 (29%) |
| Hispanic | 0 (0%) | 1 (17%) | 1 (6%) |

*Note*. Totals of percentages are not 100 for every characteristic because of rounding.

## Students

In total, 395 kindergarten through fifth-grade students were enrolled in the participating charter school at the start of the 2014-2015 school year. Because baseline data for one classroom were collected outside of the data collection window and ineligible for use in the study, data from 369 students were included in this study. In total, eleven classrooms were assigned to the Intervention condition and six classrooms were assigned to the Wait-List Comparison condition. Table 2 summarizes the characteristics of the two intervention groups by grade level, gender, and ethnicity.

Table 2

*Grade, Gender, and Ethnicity of Students (N = 369) by Intervention Group*

| Characteristic | *Second Step* Students *n* (%) | Comparison Students *n* (%) | Total Students *n* (%) |
|---|---|---|---|
| Grade | | | |
| Kindergarten | 46 (19%) | 25 (20%) | 71 (19%) |
| First | 48 (20%) | 22 (17%) | 70 (19%) |
| Second | 42 (17%) | 21 (17%) | 63 (17%) |
| Third | 43 (18%) | 22 (17%) | 65 (18%) |
| Fourth | 19 (8%) | 16 (13%) | 35 (9%) |
| Fifth | 44 (18%) | 21 (17%) | 65 (18%) |
| Total | 242 (100%) | 127 (100%) | 369 (100%) |
| Gender | | | |
| Female | 127 (52%) | 60 (47%) | 187 (51%) |
| Male | 115 (48%) | 67 (53%) | 182 (49%) |
| Ethnicity | | | |
| African American | 214 (88%) | 118 (93%) | 332 (90%) |
| Hispanic | 23 (10%) | 8 (6%) | 31 (8%) |
| White | 4 (2%) | 0 (0%) | 4 (1%) |
| American Indian | 1 (< 1%) | 1 (1%) | 2 (< 1%) |

*Note*. Totals of percentages are not 100 for every characteristic because of rounding.

Statistical power analysis was used to determine if the available sample size from the existing dataset was sufficient to detect the expected effect size for this study. G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007), a stand-alone power analysis program available free of charge via the Internet (http://www.gpower.hhu.de/), was used to conduct this analysis. To determine the likelihood that any observed differences between group means occurred randomly or as a result of the intervention, the criterion for significance (alpha level of Type I error rate) was set at 0.05. The test was one-tailed; meaning only an effect in the expected direction was interpreted. With the existing sample size of 369 (Intervention = 242, Wait-List Comparison = 127), this study had a power of 80% to yield an effect size of .31 (minimum sample size = 358; Intervention = 231, Wait-List Comparison = 126). It was determined that an effect size of this magnitude was comparable to other studies in the field of SEL research (Durlak et al., 2011, Payton et al., 2008) and that the existing dataset was sufficient to address the study's primary research questions. The primary goal of this study was to test the hypothesis that students

receiving *Second Step* programming would show greater improvement in social-emotional competence and academic achievement than students assigned to wait-list comparison classrooms.

### *Second Step* Training and Delivery

During the 2014/15 academic year, the participating school district integrated universal *Second Step* with its existing academically focused tiered model of assessment and support. *Second Step: K-5 4th Edition* (Committee for Children, 2012) is a universal SEL program designed to promote social competence and reduce social-emotional problems in elementary students. The program builds on cognitive behavioral intervention models, predicated on the idea that thoughts affect people's social interactions (Crick & Dodge, 1994). The content of the program is broken into four primary areas of instruction: (a) skills for learning; (b) empathy; (c) emotion management; and (d) problem solving. Social-emotional skills are taught using direct, explicit instruction. The program is designed to be user-friendly and implemented by various school professionals in a variety of settings.

Teachers assigned to the Intervention condition delivered *Second Step* during the first phase of program implementation (October through January) and teachers assigned to the Wait-List Comparison condition delivered the intervention during the second phase of implementation (February through May). At the time of classroom assignment, Intervention teachers were issued a *Second Step* curriculum kit, a training schedule, and a lesson delivery timeline. The district sponsored and the school social worker facilitated a two-hour *Second-Step* training for Intervention teachers in September 2014. Wait-List Comparison teachers participated in a similar training in January 2015, following completion of the first phase of intervention implementation and data collection. The *Second Step* training focused on program core components and best

practices for teaching and reinforcing the lesson content. The web-based training included a program overview, information about the links between social emotional learning and academics, curriculum exploration, and program videos. The school social worker met with Intervention classroom teachers one week after the *Second Step* training session to answer questions, review materials, and reiterate the implementation schedule and expectations.

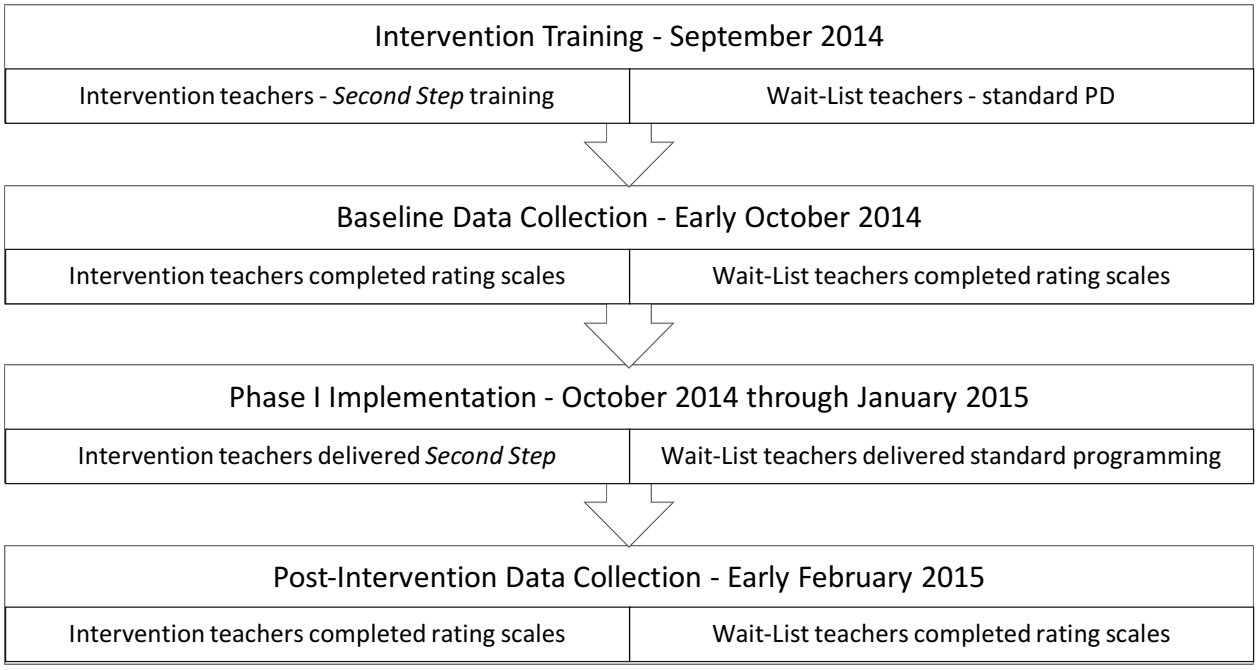


Figure 3. *Second Step implementation and data collection schedule.*

Figure 3 provides a summary of the intervention implementation and data collection timeline. Trained Intervention classroom teachers delivered the twenty-two *Second Step* lessons in 30- to 40-minute classroom sessions twice per week from October through January for a total of approximately eleven weeks of instruction. During phase one of implementation (October through January), students in Wait-List Comparison classrooms participated in the school's standard, academically focused RTI programming that did not include SEL instruction. In early-February, following completion of phase one of SEL program implementation and data

collection, Wait-List Comparison teachers participated in the *Second Step* web-based training. Following training, Wait-List Comparison teachers delivered the *Second Step* curriculum to their students during the second phase of implementation (February through May). It should be noted, however, that the focus of the proposed study is on the first phase of SEL program implementation (October through January).

## Measures

To address the primary research questions, this study involved analysis of existing student data from two areas of development: (1) social-emotional competence and (2) academic achievement. A description of the outcome and screening measures used in compiling the existing dataset used in this study follows.

### Social-Emotional Competence Outcome Measure

The *Devereux Student Strengths Assessment – Second Step Edition* (DESSA-SSE; LeBuffe et al, 2011) behavior scale, part of the Devereux Center for Resilient Children (DCRC) assessment package, was included in the dataset considered in this study. All measures from the DCRC assessment package are strength-based and designed to assess competencies shown to serve as protective factors for children in kindergarten through eighth-grade. The 36-item DESSA-SSE was derived from the lengthier 72-item Devereux Student Strengths Assessment (DESSA; LeBuffe, Shapiro, & Naglieri, 2009) and developed based on the social-emotional content covered in the *Second Step* curriculum (Committee for Children, 2012). The reduced time requirement for completion and tighter alignment with *Second Step* were features that persuaded the school to choose the DESSA-SSE over the full version of the DESSA as a measure of social-emotional outcomes and student response to SEL intervention.

All teachers (Intervention and Wait-List Comparison) completed a web-based DESSA-SSE via the EVO Social/Emotional online assessment platform (Apperson, Cerritos, CA) for each student in their classroom at pretest (October 2014) and again at posttest (January 2015). To complete the scale for each student, the teacher read the stem: "During the past 4 weeks, how often did the child …" and then rated questions using a 5-point Likert-type scale. The DESSA-SSE total raw scores range from 0 to 144, with high scores suggesting higher levels of social and emotional competency. The web-based DESSA-SSE can be completed in less than 5 minutes per student.

The DESSA-SSE generated four subscale scores and one composite score. The Social Emotional Composite (SEC) provides an overall indication of the strength of the student's social and emotional competence. The four subscales include Skills for Learning (9 items), Empathy (9 items), Emotional Management (9 items), and Problem Solving (9 items). Raw scores on the SEC and each subscale were converted to *T-scores* and provided an estimate of social and emotional competence based on a comparison to national norms. The normative sample ($n$ = 1,250) closely approximated the kindergarten through eighth-grade population of the United States with respect to age, gender, geographic region of residence, race, ethnicity, and socioeconomic status (LeBuffe et al., 2011). The authors of the DESSA rating scales recommend that the SEC and subscale *T*-score value of 40 (one *SD* below the normative mean) be used as the cutoff score that indicates a need for social-emotional instruction. Alternatively, the authors suggest *T*-scores from 41 to 44 can be used to develop an "at-risk" category to align with tiered frameworks for intervention (Naglieri et al., 2011). That is, DESSA scores at or above 45 categorized as *low risk*, sores of 41 to 44 categorized as *moderate risk*, and scores at or below 40 categorized as *high risk*.

Evidence reported in the technical manual indicates that the DESSA-SSE can be used with confidence as a reliable assessment of students' social-emotional competence (LeBuffe et al., 2011). The internal reliability coefficients of the four DESSA-SSE subscales (.90 to .93) as well as the composite (.98) exceed the commonly accepted .90 minimum (e.g., Salvia, Bolt, & Ysseldyke, 2010). The measure has also demonstrated strong test-retest reliability, with correlations coefficients ranging from .90 (Empathy) to .94 (Skills for Learning and Problem Solving). As noted in the manual, this similarity in scores over time in the absence of targeted social-emotional instruction is an important measurement characteristic to consider when evaluating SEL intervention outcomes (as is the case in this research study). To date, only one published study in the professional literature has utilized the DESSA-SSE as an outcome measure for determining the effects of *Second Step* on student social-emotional competence (Low et al., 2015). Low and colleagues reported reliability similar to those reported in the DESSA-SSE technical manual, with coefficients for the four subscales ranging from .91 (Emotion Management subscale) to .98 for the composite score (SEC). The alpha coefficients calculated for the current sample indicate similarly high internal reliability as that found in the Low et al., study (2015) and in the technical manual. The following Cronbach alpha coefficients obtained for the DESSA-SSE subscales and composite scores with the current sample also indicated good internal consistency: Skills for Learning = .96, Empathy = .94, Emotion Management = .93, Problem Solving = .95, and Social Emotional Composite = .98.

Evidence of criterion-related validity cited in the technical manual demonstrate that the DESSA-SSE scores differentiated between groups of children with and without known social-emotional problems. Compared to typically developed children, students already identified as having substantial social-emotional problems were rated significantly lower on the DESSA-SSE

(*d*-ratios ranging from .90 to 1.5 with large effect sizes). Although these findings suggest that the DESSA-SSE can serve as a reliable and valid tool for measuring social-emotional outcomes, there is a need to further examine the utility of the measure in the real-world context of a tiered model of educational programming.

Academic Outcome Measure

Classroom teachers administered the Northwest Evaluation Association (NWEA) Measures of Academic Progress (MAP; Northwest Evaluation Association, 2009) mathematics and reading tests three times across the school year as part of the districtwide evaluation program. MAP assessments are norm-referenced, computer-administered achievement tests designed to assess content typically taught in specific grade bands and measure student academic achievement and growth. The content of the math subtest is designed to assess number sense, estimation and computation, geometry, algebra, measurement, and statistics and probability. The reading subtest measures word recognition and vocabulary, reading comprehension, and literature. The MAP technical manual provides evidence of strong reliability and concurrent validity for both the math and reading assessments (Northwest Evaluation Association, 2009).

Scores on the MAP are reported as Rasch Unit (RIT) scores, percentiles, and analyses of progress. The RIT scale is an equal interval scale with a range of 150 to 250. The RIT score provides an estimate of student achievement based on the difficulty of individual items. Using this scale, results of the MAP also can be reported as improvement scores, which represent the number of RIT points gained by a student since the previous assessment and the extent to which a student exceeds or falls short of average growth. The students' Reading and Math RIT scores from the fall and winter administration of the MAP were used for the analyses in this study.

Social-Emotional Screening Measure

The *Devereux Student Strengths Assessment Mini* (DESSA-mini; Naglieri et al., 2011), another measure included in the DCRC assessment package, was used as a brief screener of social-emotional competence in this study. Based on the 72-item Devereux Student Strengths Assessment (DESSA; LeBuffe, Shapiro, & Naglieri, 2009), the web-based DESSA-mini is comprised of four 8-item parallel forms designed to be a technically sound, universal screening tools that can be completed in one to two minutes per student (Naglieri et al., 2011). As the participating school was interested in exploring feasible methods for collecting and utilizing universal SEL data within a tiered model, the DESSA-mini was chosen because of its minimal time requirements and potential for frequent and reliable assessment of students' overall social-emotional competence and response to intervention. All teachers (Intervention and Wait-List Comparison) completed Form 1 of the web-based DESSA-mini for all students assigned to their classroom during the two weeks prior to the *Second Step* implementation (October 2014). As with the DESSA-SSE, teachers read a sentence stem: "During the past four weeks, how often did the child …" and then rated questions using a 5-point Likert-type scale. The total raw score generated by the DESSA-mini ranges from 0 to 32, with high scores suggesting higher levels of social-emotional competence. The DESSA-mini yields a single *T*-score, the Social Emotional Total (SET), which provides an estimate of the strength of the student's overall social-emotional competence based on a comparison to national norms. As with the DESSA-SSE, the DESSA-mini SET scores can be used to categorize students' as demonstrating low risk (at or above 45), moderate risk (41 to 44), or high risk (at or below 40) of experiencing social-emotional difficulty.

Reliability evidence reported in the DESSA-mini technical manual indicates that the measure can be used with confidence as a screener for social and emotional competence (Naglieri, LeBuffe, & Shapiro, 2011). Reported internal reliability coefficients for the four DESSA-mini forms range from 0.91 (DESSA-mini 1) to 0.92 (DESSA-mini 3), exceeding the .90 alpha standard for a total score suggested by Bracken (1987) and the .80 standard of reliability recommended by Salvia, Bolt, and Ysseldyke (2010) for screening decisions. The alpha coefficient calculated for the DESSA-mini (Form 1) with the current sample indicates similarly high internal reliability (.95) as that reported in the technical manual. Reliability evidence also indicates that each of the DESSA-mini forms has excellent test-retest reliability (coefficients ranging from .88 to .94), providing increased confidence that observed differences between pretest and posttest scores are less likely to be attributable to error variance or the simple passage of time. The stability of a measurement tool across time has relevance in the context of this study's proposed tiered model of programming that relies heavily on a measure's ability to reliably detect changes in student competencies and determine response to intervention.

The DESSA-mini technical manual cites additional validity evidence, lending further support for the utility of the measure as a universal measure of social and emotional competence. The DESSA-mini has been found to be a strong predictor of overall competence scores obtained on the full 72-item DESSA, with correlations ranging from .95 to .96 across the four DESSA-mini forms. The DESSA-mini has also been found to differentiate groups of children with and without known social-emotional problems, with large and significant differences between ratings of the two groups (*d*-ratios ranging from 1.17 to 1.39). Additionally, the four DESSA-mini forms and the full DESSA have been found to identify the same children as needing SEL instruction 94.5 to 95.3% of the time (based on a cutoff score of 40). Consistency between the DESSA-mini

and full DESSA in identification of students in need of instruction has also been shown to hold across racial and ethnic groups, with the two measures demonstrating agreement 85.1% of the time when identifying African American students, 80.7% of the time when identifying Hispanic students, and 83.3% of the time when identifying White students. Given the high proportion of African American students included in the current sample, the demonstrated consistency of the DESSA-mini with the more comprehensive DESSA across diverse racial and ethnic groups lends further support for the legitimacy of its use as a social emotional screener in this study.

The accuracy and efficiency of the DESSA-mini compare favorably with other commonly used screening instruments in schools. For example, Kamphaus and Reynolds (2007) reported that the 27-item *Behavioral and Emotional Screening System* (BESS) demonstrated internal consistency reliability coefficients from .90 to .96 and test-retest reliability coefficients from .80 to .91. Adjusted correlation coefficients obtained between the BESS and the more comprehensive *Behavior Assessment System for Children, Second Edition* (BASC-2) ranged from .62 (Internalizing Problems) to .90 (Behavioral Symptoms Index). Taken together, reliability and validity data indicate preliminary evidence that the DESSA-mini is a promising universal tool for screening student social-emotional competence in the school setting (Naglieri et al., 2011). As with the DESSA-SSE, further examination of the utility of the DESSA-mini within a tiered framework of educational programming is warranted.

Academic Screening Measure

Teachers administered the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminiski, 1996) measures at three benchmarking windows (fall, winter, spring) across the academic year. DIBELS are a set of procedures and tests for assessing the acquisition of skills from kindergarten through sixth grade in each of the key literacy areas:  phonemic

awareness, alphabetic principle, accuracy and fluency with connected text, reading comprehension, and vocabulary. The screening measures were designed for use in identifying children having trouble developing early literacy skills and are commonly used in schools operating from an academically focused, RTI approach to literacy development. The DIBELS program of research builds on assessment procedures from Curriculum-Based Measurement (CBM; e.g., Deno & Fuchs, 1987) and General Outcome Measurement (GOM; Fuchs & Deno, 1991). Ongoing research since the late 1980s has documented DIBELS's reliability, validity, and sensitivity to change in literacy development. Additional information and technical reports can be found on the Dynamic Management Group website at https://dibels.org.

The DIBELS Next assessment provides two types of scores at each benchmark assessment period: a raw score for each individual measure and a composite score. The DIBELS Composite Score is a combination of multiple scores and provides the best overall estimate of students' early literacy skills and reading proficiency. Each score is interpreted relative to benchmark goals and cut points for risk to describe students' level of reading development as *at or above benchmark*, *below benchmark*, and *well below benchmark*. Fall DIBELS Next Composite scores and associated reading performance levels were used as an academic screening measure in this study.

Learning Risk Measure

The DESSA-mini and DIBELS categorical risk levels were dichotomized into two categories (*at risk, not at risk*) and used to create a more comprehensive screening measure for student level of learning risk. Specifically, student DESSA-mini descriptive qualifiers (*low risk, moderate risk, high risk*) were converted to a dichotomized indicator of socio-emotional risk (*moderate or high risk* = socio-emotionally at risk, *low risk* = socio-emotionally not at risk).

Similarly, student DIBELS descriptive qualifiers (*at or above benchmark, below benchmark, well below benchmark*) were collapsed into a dichotomized indicator of academic risk (*below benchmark* or *well below benchmark* = academically at risk, *at or above benchmark* = academically not at risk). Three learning risk categories were derived from all possible combinations of socio-emotional risk and academic risk: *low learning risk, moderate learning risk, high learning risk*. Figure 4 illustrates the development of the three learning risk categories.

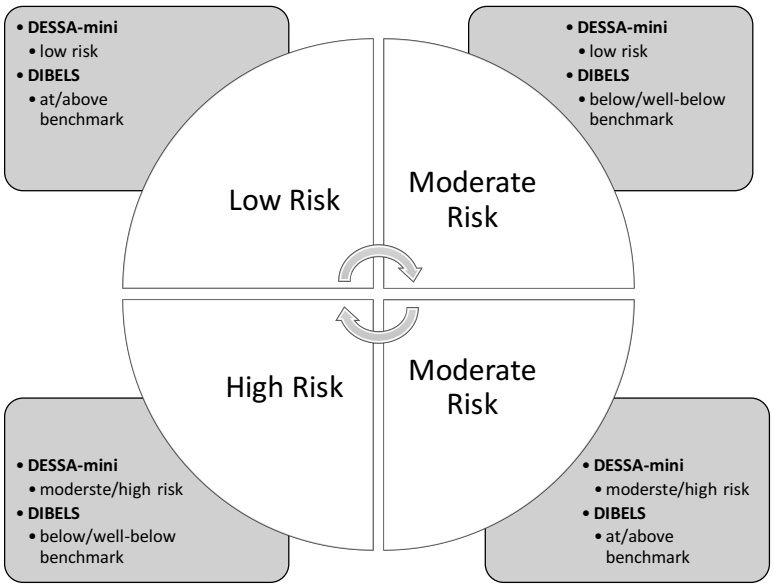


Figure 4. *Using DESSA-mini and DIBELS data to categorize student level of learning risk.*

## Data Collection

This study involved secondary analysis of preexisting data collected by the participating school during the 2014-1015 academic year. Outcome data of interest included Pretest and Posttest measurement of student social-emotional competence and academic achievement. All teachers (*Second Step* and Wait-List Comparison) completed the web-based DESSA rating scales prior to the first phase of universal *Second Step* implementation and again immediately

following completion of the first phase of the intervention. Academic achievement data were collected during the MAP fall (October) and winter (January) benchmark windows.

# CHAPTER 4

# RESULTS

This chapter presents results of the secondary analysis of extant data to investigate one elementary school's efforts to integrate *Second Step* into an existing tiered model of academic programming. Results from investigation of the relation between student level of learning risk and intervention effectiveness are also presented. A quasi-experimental wait-list comparison group design with pretest and posttest was used for this study. The dataset included teacher ratings of student social-emotional competence and academic achievement data collected at baseline and following intervention. Data were analyzed using IBM SPSS Statistics version 24.

## Preliminary Analyses

To ensure the analysis plan would adequately address the primary research questions, data were examined to identify potential sources of bias and ensure the assumptions underlying the statistical methods were satisfied. Preliminary analyses relied on numerical and statistical testing as well as visual inspection of data graphs and charts. Each variable was screened for missing data, normality, and univariate and multivariate outliers for each of the two conditions (*Second Step*, Wait-list comparison). The relations between key variables were also explored and the social-emotional competence scales were tested for reliability within the two groups.

### Missing Data

Data were examined for missing values on all outcome variables and covariates. The percentage of missing values across the six variables varied between 0.0% and 10.8%. Out of 369 cases, 59 (16.0%) were missing data on at least one outcome variable or covariate, totaling 145 missing values out of a possible 2,214 (6.5%). Most instances of missingness (73%) occurred on posttest measures and were attributable to 32 instances of student disenrollment

from the school following pretest data collection. The remaining 27 cases of incomplete data were attributable to teacher failure to complete a social-emotional competence rating scale, student nonparticipation in achievement testing due to absence, or clerical error. Attrition rates did not significantly differ between *Second Step* and comparison groups nor were differential attrition effects found on the dependent variables for gender or grade level. Table 3 presents the means and standard deviations for dependent variables and covariates by group with percentage of missing data for each measure at pretest and posttest.

Table 3

*Means and Standard Deviations for Dependent Variables and Covariates by Intervention Group with Percent Missing*

| Variable | Intervention | | | Comparison | | | Total | | | % |
|---|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *n* | *M* | *SD* | *n* | *M* | *SD* | *N* | Missing |
| Social-Emotional | | | | | | | | | | |
| Pretest | 44.51 | 10.68 | 242 | 47.72 | 8.77 | 127 | 45.62 | 10.17 | 369 | 0.0 |
| Posttest | 6.79 | 10.65 | 210 | 48.89 | 10.28 | 119 | 47.55 | 10.55 | 329 | 10.8 |
| Reading | | | | | | | | | | |
| Pretest | 167.16 | 24.29 | 234 | 170.71 | 2.21 | 118 | 168.351 | 24.21 | 352 | 4.6 |
| Posttest | 177.76 | 21.85 | 210 | 176.26 | 2.13 | 121 | 77.21 | 22.40 | 331 | 10.3 |
| Math | | | | | | | | | | |
| Pretest | 169.07 | 26.37 | 230 | 171.39 | 2.43 | 121 | 169.871 | 26.49 | 351 | 4.9 |
| Posttest | 179.56 | 21.98 | 213 | 178.73 | 2.16 | 124 | 79.26 | 22.73 | 337 | 8.7 |

Multiple imputation was used to create and analyze five multiply imputed datasets to improve the accuracy and statistical power of the analyses and results. Incomplete variables were imputed under fully conditional specification (van Buuren, 2012). Calculations were done in IBM SPSS using the Missing Values extension. Model parameters were estimated with multiple regression applied to each imputed dataset separately. These estimates and their standard errors were pooled using Rubin's rules. For comparison, the analysis was also performed on the subset of 310 complete cases.

## Screening for Outliers

As part of the preliminary analysis, data were also screened for univariate and multivariate outliers. Box plots and stem and leaf diagrams were generated and inspected to identify univariate outliers in the data. Extreme outliers were not identified on the social-emotional competence scales or academic achievement scores. Mahalnobis Distance methods did not detect multivariate outliers on the social-emotional competence scales.

## Tests for Violations of Statistical Assumptions

Preliminary analyses included testing the assumptions associated with the statistical techniques used in the study. This included testing for normality, linearity, homogeneity of variances and covariances, homogeneity of regression slopes, reliability of covariate measures, and multicollinearity. First, data were screened for univariate normality for the two groups using measures of skewness, kurtosis, histograms, and the Kolmogorov-Smirnov statistic. Although skewness and kurtosis were not found to be extreme, moderate departures from the normal distribution were noted in each of the dependent variables. Visual inspection of the reading and math score histograms indicated a somewhat flat distribution, suggesting a negative kurtosis relative to normal distribution. Examination of the four social-emotional subscale score histograms also indicated positively skewed distributions of scores. Kolmogorov-Smirnov test statistics were also significant for all dependent variables, suggesting non-normal distributions of scores. Skewness and kurtosis index values, however, for all dependent variables fell between -.868 and .554, suggesting that the distributions did not substantially depart from normality. Although preliminary analyses indicated a violation of the assumption of normal distribution at the univariate level, Tabachnick and Fidell (2013) note that in relatively large samples (200 or more cases), small deviations from normality can be deemed significant by the Kolmogorov-

Smirnov test and skewness will not "make a substantive difference in the analysis" (p. 80). In such cases, Tabachnick and Fidel (2013) recommend against transformation as it often hinders interpretation. As a partial check on multivariate normality, a matrix of bivariate scatterplots for all pairs of social-emotional competence variables was constructed. Visual examination of the plots indicated roughly linear relationships between pairs of social-emotional subscale scores, lending support for the multivariate normality of the distribution of social-emotional competence variables.

The assumption of homogeneity of variance and covariance across each group was also tested. Insignificant results from Levene's Test for Equality of Variances ($p > .05$) suggested that the *Second Step* and comparison groups were relatively equal in degree of variance and covariance on dependent variables. At the multivariate level, insignificant Box's *M* Test results similarly indicated satisfaction of the homogeneity of variance and covariance assumption.

Homogeneity of regression slopes were also evaluated to ensure that an interaction between covariates and intervention group did not exist. To test this assumption, scatterplot matrices between the dependent variables and covariates were examined. Visual inspection of the scatterplots suggested minimally dissimilar slopes. This assumption was also assessed statistically by checking whether there was a significant interaction between condition group and the covariates. Results from tests of between-subjects interaction effects for group by baseline social-emotional competence scores, $F(1, 365)=1.012$, $p = .315$, group by baseline reading scores, $F(1, 365)=1.704$, $p = .193$, and group by baseline math scores, $F(1, 365)=3.246$, $p = .072$, were not significant at an alpha level of .05. These nonsignificant results indicated that there was no interaction between the covariates and group, suggesting that the assumption of homogeneity of regression slopes was satisfied. The assumption of linearity holds that all pairs of dependent

variables and covariates demonstrate a linear relationship. Visual inspection of scatterplots for all variables for each condition group indicated approximate linearity, suggesting that the assumption of linearity was also satisfied.

Evidence of high internal consistency for all measures treated as covariates (MAP reading composite, MAP math composite, DESSA-SSE social-emotional competence composite) has been reported in the literature. Per the NWEA technical manual, the MAP reading and math composite scales have demonstrated marginal reliabilities between .89 and .96 (Northwest Evaluation Association, 2009). Similarly, the DESSA-SSE technical manual reports Cronbach alpha coefficients between .96 and .98 for the social-emotional composite scale.

Table 4

*Cronbach's Alpha (α) Coefficients of Reliability for the DESSA Scales by Intervention Group*

| Scale | *Second Step* | Comparison |
|---|---|---|
| Baseline DESSA-SSE Scores | | |
| Social-emotional composite (SEC) | .98 | .98 |
| Skills for learning | .96 | .97 |
| Empathy | .94 | .93 |
| Emotion management | .93 | .92 |
| Problem solving | .95 | .96 |
| Baseline DESSA-Mini Scores | | |
| Social-emotional total (SET) | .95 | .96 |

*Note*. DESSA-SSE = Devereux Student Strengths Assessment: *Second Step* Edition. DESSA-Mini = Devereux Student Strengths Assessment: mini.

Although evidence of high reliability for the DESSA measures is reported in the literature, it was necessary to confirm reliable use of the scales with the present sample. Reliability analyses of the DESSA-SSE and DESSA-mini were carried out using Cronbach's alpha criterion (α). Results from these analyses are shown in Table 4. Cronbach's alpha ranged from .93 to .98 on the DESSA-SSE and DESSA-mini. Results indicated that the scales had excellent reliability for both the *Second Step* and wait-list comparison groups (Tabachnick &

Fidell, 2013). Overall, the evidence suggests that the tools used to measure the covariates in the present study were psychometrically sound and satisfied the assumption concerning the reliability of the covariates.

The assumptions of MANCOVA include linearity between each pair of dependent variables for each cell of the research design. To test this assumption, a scatterplot matrix was plotted and examined. The matrix demonstrated a linear relationship between the dependent variables, suggesting that the assumption was satisfied. MANCOVA also assumes a moderate correlation ($r < 0.9$) between each dependent variable to ensure the absence of multicollinearity. To detect relationships that were too strongly correlated, Pearson correlation coefficients were calculated between the four DESSA-SSE subscale scores for each cell of the design. As shown in Tables 5 and 6, correlations ranged from $r = 0.86$ to $r = 0.95$, indicating the presence of multicollinearity and a violation of the assumption. To address the issue of multicollinearity, the problem solving subscale was identified as demonstrating the highest correlation with the other dependent variables and was removed in all subsequent analyses.

Table 5

*Pearson Correlations Between Social-Emotional Competence Variables for Second Step Group*

| | Social-Emotional Competence | | | |
|---|---|---|---|---|
| Variables | Skills for Learning | Empathy | Emotion Mng | Problem Solving |
| Skills for Learning | 1.00 | | | |
| Empathy | .87** | 1.00 | | |
| Emotion Mng | .87** | .87** | 1.00 | |
| Problem Solving | .91** | .88** | .94** | 1.00 |

** Correlation is significant at the 0.01 level (2-tailed)

Table 6

*Pearson Correlations Between Social-Emotional Competence Variables for Comparison Group*

| | Social-Emotional Competence | | | |
|---|---|---|---|---|
| Variables | Skills for Learning | Empathy | Emotion Mng | Problem Solving |
| Skills for Learning | 1.00 | | | |
| Empathy | .86** | 1.00 | | |
| Emotion Mng | .89** | .92** | 1.00 | |
| Problem Solving | .95** | .92** | .94** | 1.00 |

** Correlation is significant at the 0.01 level (2-tailed)

Equivalence of Intervention Groups at Baseline

Prior to proceeding with the primary analyses, the degree to which *Second Step* and comparison groups were equivalent on demographic characteristics and baseline measures of social-emotional competence and academic achievement was evaluated. Table 7 describes the groups in terms of level of learning risk, grade, and gender. Although analysis of variance (ANOVA) revealed statistically significant differences between the two condition groups on baseline measurement of social-emotional competence, the actual mean differences were small (Cohen's $d = .28$) and favored the comparison classrooms. Inspection of the mean scores indicated students in comparison classrooms were rated by their teachers as higher in social-emotional competence than students in *Second Step* classrooms. Statistically significant differences in reading achievement and math achievement between the groups at baseline were not found.

Table 7

*Learning Risk, Gender, and Grade of Students (N = 369) by Intervention Group*

| Characteristic | *Second Step* *n* (%) | Wait-List Comparison *n* (%) | Total *n* (%) |
|---|---|---|---|
| Learning Risk | | | |
| Low Risk | 57 (23.9%) | 44 (34.9%) | 101 (27.7%) |
| Moderate Risk | 92 (38.7%) | 51 (40.5%) | 143 (39.3%) |
| High Risk | 89 (37.4%) | 31 (24.6%) | 120 (33.0%) |
| Gender | | | |
| Male | 127 (52.5%) | 60 (47.2%) | 187 (50.7%) |
| Female | 115 (47.5%) | 67 (52.8%) | 182 (49.3%) |
| Grade Level | | | |
| Kindergarten | 46 (19.0%) | 25 (19.7%) | 71 (19.2%) |
| First | 48 (19.8%) | 22 (17.3%) | 70 (19.0%) |
| Second | 42 (17.4%) | 21 (16.5%) | 63 (17.1%) |
| Third | 43 (17.8%) | 22 (17.3%) | 65 (17.6%) |
| Fourth | 19 (7.9%) | 16 (12.6%) | 35 (9.5%) |
| Fifth | 44 (18.2%) | 21 (16.5%) | 65 (17.6%) |

ANOVA was also performed to evaluate whether there were pretest differences in social-emotional competence and academic achievement by student gender and grade level. Results indicated statistically significant differences between boys and girls in baseline social-emotional competence. Mean differences by gender neared a medium effect size with Cohen's *d* calculations at .45. Inspection of the mean scores indicated that teachers rated girls higher in social-emotional competence than boys. Statistically significant differences by grade level in social-emotional competence were not found. Although significant differences in academic achievement were indicated across grade level in the expected direction, significant achievement differences by gender were not found. To statistically reduce the confounding influence of pre-existing group differences when testing for effects of intervention group on student outcomes, baseline measurement of social-emotional competence and academic achievement were included in subsequent analyses as covariates.

## Primary Analysis

To examine the effect of *Second Step* on student outcomes, a quasi-experimental design adjusting for pretest scores was utilized. Between-groups ANCOVA and MANCOVA analyses were conducted with group (*Second Step*, Wait-list comparison), student level of learning risk (low risk, moderate risk, high risk), and gender as independent variables and baseline social-emotional competence and academic achievement as covariates. The dependent variables were social-emotional competence (skills for learning, empathy, emotion management), reading achievement, and math achievement at posttest. Means and standard deviations of the dependent variables and covariates by grade are presented in Table 8.

Table 8

*Means and Standard Deviations for Dependent Variables and Covariates by Grade*

| Grade | Social-Emotional | | Reading | | Math | |
|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Kindergarten (*n* = 71) | | | | | | |
| Pretest | 46.48 | 8.29 | 136.55 | 8.54 | 133.71 | 10.64 |
| Posttest | 47.15 | 9.32 | 150.56 | 10.74 | 150.35 | 13.76 |
| First-Grade (*n* = 70) | | | | | | |
| Pretest | 48.17 | 9.43 | 153.83 | 9.70 | 152.99 | 11.97 |
| Posttest | 46.65 | 10.89 | 162.97 | 11.09 | 165.70 | 10.71 |
| Second-Grade (*n* = 63) | | | | | | |
| Pretest | 44.81 | 13.61 | 165.21 | 12.37 | 170.25 | 12.02 |
| Posttest | 45.21 | 14.79 | 174.91 | 13.00 | 179.24 | 10.09 |
| Third-Grade (*n* = 65) | | | | | | |
| Pretest | 44.45 | 11.72 | 178.63 | 14.37 | 184.48 | 11.28 |
| Posttest | 48.67 | 10.00 | 187.42 | 12.68 | 190.66 | 10.60 |
| Fourth-Grade (*n* = 35) | | | | | | |
| Pretest | 44.57 | 9.24 | 191.63 | 14.28 | 195.83 | 10.85 |
| Posttest | 45.11 | 8.88 | 196.22 | 12.94 | 199.86 | 9.29 |
| Fifth-Grade (*n* = 65) | | | | | | |
| Pretest | 44.45 | 7.04 | 196.29 | 11.64 | 198.09 | 10.98 |
| Posttest | 48.82 | 7.81 | 200.54 | 10.63 | 202.93 | 11.96 |
| Total (*N* = 369) | | | | | | |
| Pretest | 45.62 | 10.17 | 167.88 | 24.09 | 169.78 | 25.99 |
| Posttest | 47.09 | 10.62 | 176.70 | 21.49 | 179.25 | 22.04 |

Although grade was originally included in the analysis as a control and differential effects were not predicted for this variable, examination of outcome means revealed a pattern that merited further investigation of the moderated effects of condition by student grade. The imputed means and standard deviations of dependent variables and covariates by individual grade are presented in Table 8. Analysis by individual grade (kindergarten through fifth totaling six levels) was considered, but produced inadequate cell sizes to detect statistical significance. Instead, individual grades were grouped into a dichotomous variable, lower elementary (kindergarten, first, second) and upper elementary (third, fourth, fifth), and included in the analysis.

For all analyses, the null hypotheses were rejected when $p < 0.05$. When statistically significant differences were found, the practical importance of the differences was evaluated using the standardized mean reported as Cohen's *d*. This statistic expresses the mean difference between intervention and comparison groups on outcome measures (social-emotional competence, math achievement, reading achievement) in standard deviation units. The following standard interpretation offered by Cohen was used evaluate the magnitude of the effect: small = .2, moderate = .5, large = .8 (1988). Given the questions that have arisen in the literature regarding the appropriateness of applying such standards when assessing the magnitude of school-based SEL intervention effects (e.g., Durlak et al., 2011; Payton et al., 2008), effect size was also interpreted within the context of previous research by comparing the size of effect to that achieved by other psychosocial and academic interventions. In keeping with Payton and colleagues' (2008) interpretation of the practical value of improvements in student outcomes resulting from SEL intervention, program effects were also translated into improvement indices

using Cohen's $U_3$ to show percentile gains achieved by the average student in the *Second Step* group compared to the average student in the wait-list comparison group (Cohen, 1988).

## Effects of *Second Step* on Social-Emotional Competence

Multivariate analysis of covariance (MANCOVA) was conducted to examine the effect of universal *Second Step* programming on elementary students' social-emotional competence and answer the first research question.

RQ1: Controlling for baseline social-emotional competence, do students receiving *Second Step* intervention show greater improvement in social-emotional competence (skills for learning, empathy, emotion management, problem solving) than students in a wait-list comparison group? If so, do improvements in social-emotional competence depend on student level of learning risk at baseline? Are intervention effects moderated by gender?

Hypothesis 1a: Students receiving *Second Step* would show greater improvements in the combination of social-emotional competencies than students in a wait-list comparison group.

Hypothesis 1b: Students demonstrating a higher level of learning risk at baseline would show greater improvements in social-emotional competence students demonstrating lower learning risk.

Hypothesis 1c: The effects of *Second Step* would be moderated by gender, with boys benefiting more from participation in SEL programming than girls.

Table 9 summarizes the data analysis procedures to test the first research question and hypotheses: Analysis included two independent variables (intervention group and learning risk) and three dependent variables (skills for learning, empathy, emotion management) measures of social-emotional competence. Gender and grade level were included as control variables and

baseline social-emotional competence was included as a covariate. Descriptive statistics for the three social-emotional competence outcome variables by intervention group, learning risk, gender, and grade are presented in Table 10.

Table 9

*Research Question 1 and Data Analysis*

| Research Question | Variables | Measures | Data Analysis |
|---|---|---|---|
| Do students receiving *Second Step* show greater improvement in social-emotional competence than students in a wait-list comparison group? If so, do improvements in social-emotional competence depend on student level of learning risk at baseline? Are intervention effects moderated by gender? | IV: Group<br>IV: Category of Risk<br><br>COV: Pretest SEC<br><br>MODERATOR: Gender<br>CONTROL: Grade<br><br>DV: Posttest Scores<br>Skills for Learning<br>Empathy<br>Emotion Mng<br>Problem Solving | DESSA-SSE<br>DESSA-mini<br>DIBELS | MANCOVA |

Table 10

*Descriptive Statistics for Social-Emotional Competence Variables by Intervention Group, Learning Risk, Grade, and Gender*

| Variable | Level | *n* | Social Emotional Competence | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | SLT | | EPT | | EMT | |
| | | | *Adj M* | *SD* | *Adj M* | *SD* | *Adj M* | *SD* |
| Group | *Second Step* | 238 | 47.80 | 10.38 | 47.29 | 10.56 | 48.32 | 10.75 |
| | Comparison | 126 | 47.10 | 10.40 | 47.85 | 9.76 | 48.60 | 10.07 |
| Elementary Grade | Lower | 200 | 45.40 | 11.31 | 46.60 | 11.61 | 47.20 | 11.91 |
| | Upper | 164 | 49.49 | 9.05 | 48.55 | 8.67 | 49.73 | 8.71 |
| Learning Risk | Low | 101 | 51.88 | 10.02 | 49.16 | 10.06 | 50.84 | 10.41 |
| | Moderate | 143 | 45.88 | 8.24 | 47.00 | 9.21 | 47.53 | 9.41 |
| | High | 120 | 44.58 | 7.74 | 46.55 | 8.25 | 47.03 | 7.23 |
| Gender | Male | 186 | 47.10 | 10.22 | 46.25 | 9.85 | 47.88 | 10.23 |
| | Female | 178 | 47.80 | 10.12 | 48.89 | 10.08 | 49.05 | 10.38 |

*Note*. SLT = Skills for Learning Total. EPT = Empathy Total. EMT = Emotion Management Total. Adjusted mean based upon Baseline SLT, EPT, and EMT scores.

The MANCOVA did not yield a significant main effect for intervention group, $F(3, 337)=1.10$, $p>.05$, as predicted. Results revealed a main effect for grade level, $F(3, 337)=7.61$, $p<.01$, $d=.52$., that was qualified by a significant interaction with intervention group on the combined dependent variables $F(3, 337)=4.88$, $p<.05$, $d=.42$. *Second Step* students in the lower elementary grades showed greater improvements on the combined social-emotional competence scores (skills for learning, empathy, emotion management) from pretest to posttest than lower elementary students in comparison classrooms. Multivariate results adjusted for baseline social-emotional competence scores are presented in Table 11.

Table 11

*Multivariate Analysis of Covariance Summary for Social-Emotional Competence by Intervention Group, Learning Risk, Grade, and Gender*

| Source | Pillai's Trace | *df* | Error | *F* | Cohen's *d* |
|---|---|---|---|---|---|
| Covariate | .324 | 3 | 337 | 53.90* | 1.38 |
| Intervention Group | .010 | 3 | 337 | 1.10 | .20 |
| Learning Risk | .118 | 6 | 676 | 7.04* | .50 |
| Grade | .063 | 3 | 337 | 7.61* | .52 |
| Gender | .032 | 3 | 337 | 3.75* | .36 |
| Group * Risk | .021 | 6 | 676 | 1.17 | .20 |
| Group * Grade | .042 | 3 | 337 | 4.88* | .42 |
| Group * Gender | .012 | 3 | 337 | 1.40 | .22 |

Note. Multivariate *F* ratios were generated from Pillai's statistic.
*p < .05.

Cohen's $U_3$ index was used to translate effect sizes into a percentile rank for the average student in the *Second Step* group compared to the average comparison student who ranks at the 50th percentile. The mean effect size on measures of lower elementary students' social-emotional competence translates into a percentile difference of 16%. In other words, the average lower

elementary student in *Second Step* classrooms showed a 16-percentile-point gain in social-emotional competence compared to the average lower elementary student in a comparison classrooms. Improvements in social-emotional competence in the upper elementary grades were not significantly different for *Second Step* students and comparison students.

Table 12

*Univariate Analysis of Covariance Summary for Social-Emotional Competence by Intervention Group, Learning Risk, Grade, and Gender for Measures*

| Source | Skills for Learning | | | Empathy | | | Emotion Management | | |
|---|---|---|---|---|---|---|---|---|---|
| | *df* | *F* | *d* | *df* | *F* | *d* | *df* | *F* | *d* |
| Covariate | 1 | 103.28* | 1.11 | 1 | 121.21* | 1.19 | 1 | 160.63* | 1.38 |
| Group | 1 | .62 | .09 | 1 | .37 | .06 | 1 | .10 | .00 |
| Learning Risk | 2 | 18.78* | .67 | 2 | 2.23 | .23 | 2 | 5.50* | .36 |
| Grade | 1 | 21.20* | .50 | 1 | 4.47* | .23 | 1 | 8.14* | .31 |
| Gender | 1 | .62 | .09 | 1 | 8.04* | .31 | 1 | 1.73 | .14 |
| Group * Risk | 2 | 2.07 | .22 | 2 | .75 | .13 | 2 | 1.04 | .16 |
| Group * Grade | 1 | 1.25 | .13 | 1 | 6.22* | .27 | 1 | .132 | .00 |
| Group * Gender | 1 | 1.46 | .13 | 1 | .42 | .06 | 1 | 2.80 | .18 |

Note. *d* = Cohen's *d*.
*p < .05.

Given the significance of the overall test, the univariate interaction effects for intervention group by grade were examined. There was a significant univariate interaction effect for intervention group and grade on improvement in empathy skills, $F(1, 300)=6.22$, $p=.013$, $d=.27$. Univariate interaction effects for skills for learning, $F(1, 300)=1.248$, $p=.265$, and emotion management, $F(1, 300)=0.132$, $p=.716$, were not significant. *Second Step* students in the lower grades showed greater improvement in empathy skills than lower elementary students in comparison classrooms. In the upper elementary grades, however, students in comparison

classrooms showed greater gains in empathy skills than peers in *Second Step* classrooms. Univariate results adjusted for baseline social-emotional competence scores are presented in Table 12.

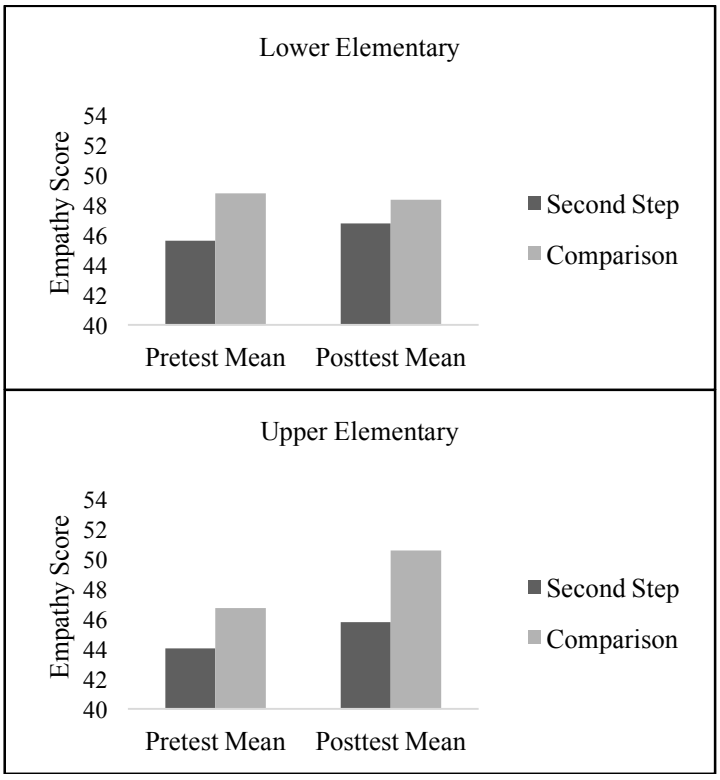


Figure 5. *Simple plot for interaction effects between intervention group by grade level on mean empathy score*

The hypothesis that students receiving *Second Step* would show greater improvements in social-emotional competencies than students in a comparison group (Hypothesis 1a) was partially supported by these findings. Although greater gains in social-emotional competence skills were observed for *Second Step* students in the lower elementary, intervention effects were not uniformly found across all grade levels. *Second Step* students showed greater improvement in empathy skills than peers in comparison classrooms. The opposite effect was observed in the upper grades with students in comparison classrooms showing greater gains than peers in *Second*

*Step* classrooms. The significant interaction effect for intervention by group level on improvements in empathy skills is illustrated in Figure 5.

MANCOVA results also yielded a significant main effect for level of learning risk (low, moderate, high) on the improvement in social-emotional competence scores, $F(6,676)=7.04$, $p<.05$, $d=.50$. Students demonstrating low learning risk at baseline showed greater overall improvements in social-emotional competence from pretest to posttest than students demonstrating moderate and high learning risk. Results did not yield the anticipated significant multivariate interaction effect for learning risk and intervention group on improvements in social-emotional competence, $F(6, 676)=1.17$, $p>.05$. As illustrated in Table 11, examination of the univariate main effect for learning risk revealed significantly greater improvement in skills for learning, $F(2, 300)=18.78$, $p<.001$, $d=.67$, and emotion management, $F(2, 300)=5.498$, $p=.035$, $d=.36$. A significant univariate effect for learning risk on improvement in empathy skills was not found, $F(2, 300)=2.228$, $p = .109$. Significant pairwise mean differences found low learning risk students, compared to moderate and high learning risk students, made greater gains in skills for learning and emotion management scores from pretest to posttest. Overall, lower learning risk students were found to demonstrate greater gains in social-emotional competence from pretest to posttest than moderate and high learning risk students. Contrary to expectations, the effect of *Second Step* participation on improvements on social-emotional competence was not significantly moderated by student level of learning risk at baseline. Results from the study failed to support the hypothesis that students demonstrating higher levels of learning risk would benefit more from *Second Step* participation than lower learning risk students (Hypothesis 1b).

MANCOVA results yielded a significant main effect for gender on improvements in the combined social-emotional subscale scores, $F(3, 337)=3.75$, $p<.05$, $d=.36$. Overall, girls

demonstrated greater gains in social-emotional competence from pretest to posttest compared to boys. Gender did not moderate the effect of *Second Step* on improvements in social-emotional competence as predicted, $F(3, 337)=1.40$, $p>.05$. Examination of the univariate main effects for gender indicated that girls showed greater improvement in empathy skills from pretest to posttest compared to boys, $F(1, 300)=8.04$, $p=.005$, $d=.31$. Significant differences between boys and girls on improvements in skills for learning, $F(1, 300)=0.619$, $p = .432$, and emotion management, $F(1, 300)=1.73$, $p = .189$, were not found. Descriptive statistics disaggregated by intervention group for performance on the three social-emotional competence outcome by grade, learning risk, and gender are presented in Tables 13, 14, and 15 respectively.

Table 13

*Descriptive Statistics of Social-Emotional Competence by Intervention Group and Grade Level*

| Group | Elementary Grade | *n* | Social Emotional Competence | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | SLT | | EPT | | EMT | |
| | | | *Adj M* | *SD* | *Adj M* | *SD* | *Adj M* | *SD* |
| *Second Step* | Lower | 133 | 46.25 | 11.05 | 47.46 | 11.70 | 47.22 | 11.96 |
| | Upper | 105 | 49.34 | 9.38 | 47.12 | 8.94 | 49.43 | 8.97 |
| Comparison | Lower | 67 | 44.56 | 11.85 | 45.73 | 11.45 | 47.18 | 11.60 |
| | Upper | 59 | 49.63 | 8.40 | 49.98 | 7.29 | 50.03 | 8.09 |

*Note*. SLT = Skills for Learning Total. EPT = Empathy Total. EMT = Emotion Management Total. Adjusted mean based upon Baseline SLT, EPT, and EMT scores.

Table 14

*Descriptive Statistics of Social-Emotional Competence by Intervention Group and Learning Risk*

| Group | Learning Risk | *n* | Social Emotional Competence | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | SLT | | EPT | | EMT | |
| | | | *Adj M* | *SD* | *Adj M* | *SD* | *Adj M* | *SD* |
| *Second Step* | Low | 57 | 50.95 | 9.63 | 48.26 | 10.02 | 49.93 | 10.63 |
| | Moderate | 92 | 46.84 | 8.86 | 46.52 | 10.11 | 47.26 | 10.14 |
| | High | 89 | 45.59 | 8.36 | 47.10 | 8.72 | 47.78 | 7.78 |
| Comparison | Low | 44 | 52.81 | 10.58 | 50.07 | 10.10 | 51.74 | 10.18 |
| | Moderate | 51 | 44.91 | 7.06 | 49.49 | 7.17 | 47.79 | 7.82 |
| | High | 31 | 43.57 | 5.65 | 46.01 | 6.84 | 46.27 | 5.48 |

*Note*. SLT = Skills for Learning Total. EPT = Empathy Total. EMT = Emotion Management Total. Adjusted mean based upon Baseline SLT, EPT, and EMT scores.

Table 15

*Descriptive Statistics of Social-Emotional Competence by Intervention Group and Gender*

| Group | Gender | *n* | Social Emotional Competence | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | SLT | | EPT | | EMT | |
| | | | *Adj M* | *SD* | *Adj M* | *SD* | *Adj M* | *SD* |
| *Second Step* | Male | 126 | 46.91 | 10.31 | 45.67 | 10.38 | 47.00 | 10.54 |
| | Female | 112 | 48.68 | 10.38 | 48.91 | 10.05 | 49.65 | 10.42 |
| Comparison | Male | 60 | 47.28 | 10.63 | 46.84 | 8.51 | 48.76 | 9.40 |
| | Female | 66 | 46.91 | 10.23 | 48.87 | 9.90 | 48.45 | 10.16 |

*Note*. SLT = Skills for Learning Total. EPT = Empathy Total. EMT = Emotion Management Total. Adjusted mean based upon Baseline SLT, EPT, and EMT scores.

## Effects of *Second Step* on Academic Achievement

Separate analyses of covariance (ANCOVA) were conducted to examine the effectiveness of *Second Step* programming in promoting elementary students' reading achievement and math achievement and to answer research question 2.

RQ2: Controlling for baseline achievement, do students receiving *Second Step* intervention show greater improvement in academic achievement than students in a wait-list comparison group? If so, do improvements in reading achievement depend on student level of learning risk at baseline? Are intervention effects moderated by gender?

Hypothesis 2a: Students receiving *Second Step* intervention would show greater improvement in reading and math achievement than students in a wait-list comparison group.

Hypothesis 2b: Students demonstrating a higher level of learning risk at baseline would show greater improvements in reading achievement than students demonstrating lower learning risk.

Hypothesis 2c: The effects of *Second Step* on reading and math achievement will be moderated by gender, with boys benefiting more from participation in SEL programming than girls.

Table 16 summarizes the procedures used to test research question 2 and associated hypotheses. The independent variables were group (*Second Step,* comparison) and learning risk at pretest (low, moderate, high). Baseline measures of academic achievement were included as covariates. Student gender and grade were also included as control variables in the analyses. Descriptive statistics for reading and math achievement by intervention group, learning risk, gender, and grade are presented in Table 17.

Table 16

*Research Question 2 and Data Analysis*

| Research Question | Variables | Measures | Data Analysis |
|---|---|---|---|
| Do students receiving *Second Step* show greater improvement in academic achievement than students in a wait-list comparison group? If so, do improvements in academic achievement depend on student level of learning risk at baseline? Are intervention effects moderated by gender? | IV: Group<br>IV: Category of Risk<br><br>COV: Pretest Achievement<br><br>MODERATOR: Gender<br>CONTROL: Grade<br><br>DV: Posttest Achievement | MAP<br>DESSA-mini<br>DIBELS | ANCOVA |

Table 17

*Descriptive Statistics for Academic Achievement by Intervention Group, Learning Risk, Grade, and Gender*

| Variable | Level | *n* | Reading Achievement | | Math Achievement | |
|---|---|---|---|---|---|---|
| | | | *Adj M* | *SD* | *Adj M* | *SD* |
| Group | *Second Step* | 238 | 178.01 | 20.85 | 180.03 | 21.28 |
| | Comparison | 126 | 175.66 | 23.09 | 178.15 | 23.84 |
| Elementary Grade | Lower | 200 | 175.59 | 15.24 | 175.37 | 16.61 |
| | Upper | 164 | 182.59 | 13.26 | 182.86 | 12.16 |
| Learning Risk | Low | 101 | 178.21 | 21.32 | 181.32 | 20.74 |
| | Moderate | 143 | 175.60 | 21.88 | 178.83 | 23.47 |
| | High | 120 | 176.70 | 19.73 | 177.12 | 20.81 |
| Gender | Male | 186 | 176.50 | 21.32 | 178.98 | 22.36 |
| | Female | 178 | 177.19 | 21.96 | 179.26 | 22.04 |

*Note*. Adjusted mean based upon Baseline Reading and Math Achievement scores.

Adjusting for baseline scores, significant main effects for group were found on improvements in reading, $F(1, 351)=5.56$, $p=.019$, $d=.26$, and math, $F(1, 351)=5.36$, $p=.021$, $d=.25$. The overall effect of group, however, was qualified by a significant interaction with grade level on reading, $F(1, 351)=5.79$, $p<.001$, $d=.26$, and math, $F(1, 351)=7.34$, $p<.001$, $d=.35$. Lower elementary students in *Second Step* classrooms demonstrated greater gains in reading and math achievement compared to lower elementary students in comparison classrooms. Using Cohen's $U_3$ to translate achievement into a percentile rank for the average student in the *Second Step* group compared to the average comparison student who ranks at the 50$^{th}$ percentile, results indicated a percentile difference of 10% in reading achievement and 11% in math achievement for lower elementary students in *Second Step* classrooms. In other words, the average lower elementary student in comparison classrooms would demonstrate a 10-percentile-point (reading) to 11-percentile-point (math) gain in achievement if they had participated in *Second Step*

programming. Similar differences between *Second Step* and comparison students in the upper elementary grades were not found.

ANCOVA results for improvements in academic achievement scores from pretest to posttest are presented in Table 18 (reading) and Table 19 (math). The significant interactions for intervention group by grade on improvements in academic achievement scores are illustrated in Figure 6 (reading) and Figure 7 (math). These findings indicate that the positive impact of participation in *Second Step* on academic achievement was not uniformly observed and significantly depended on grade level.

Table 18

*Analysis of Covariance Summary for Reading Achievement by Intervention Group, Learning Risk, Gender, and Grade*

| Source | *SS* | *df* | *MS* | *F* | Cohen's *d* |
|---|---|---|---|---|---|
| Intervention Group | 377.67 | 1 | 377.67 | 5.56* | .26 |
| Learning Risk | 378.10 | 2 | 189.05 | 2.79 | .26 |
| Gender | 14.04 | 1 | 14.04 | .20 | .06 |
| Grade Level | 947.81 | 1 | 947.81 | 13.96* | .40 |
| Intervention Group x Learning Risk | 458.37 | 2 | 229.19 | 3.38* | .28 |
| Intervention Group x Gender | 1.15 | 1 | 1.15 | .02 | .06 |
| Intervention Group x Grade Level | 392.87 | 1 | 392.87 | 5.79* | .26 |
| Error | 23823.80 | 351 | 67.87 | | |

*Note:* $R^2 = .860$, adj. $R^2 = .855$. Other possible two-way and three-way interactions were not significant at the .05 level.
* $p < .05$

Table 19

*Analysis of Covariance Summary for Math Achievement by Intervention Group, Learning Risk, Gender, and Grade*

| Source | *SS* | *df* | *MS* | *F* | Cohen's *d* |
|---|---|---|---|---|---|
| Intervention Group | 448.30 | 1 | 448.30 | 5.36* | .25 |
| Learning Risk | 778.01 | 2 | 389.01 | 4.65* | .33 |
| Gender | 5.34 | 1 | 5.34 | .064 | .00 |
| Grade Level | 1494.87 | 1 | 1494.87 | 17.87* | .45 |
| Intervention Group x Learning Risk | 223.33 | 2 | 111.66 | 1.33 | .18 |
| Intervention Group x Gender | 14.20 | 1 | 14.20 | .170 | .06 |
| Intervention Group x Grade Level | 614.14 | 1 | 614.14 | 7.34* | .35 |
| Error | 29370.69 | 351 | 83.68 | | |

*Note:* $R^2$ = .835, adj. $R^2$ = .830. Other possible two-way and three-way interactions were not significant at the .05 level.
* p < .05.

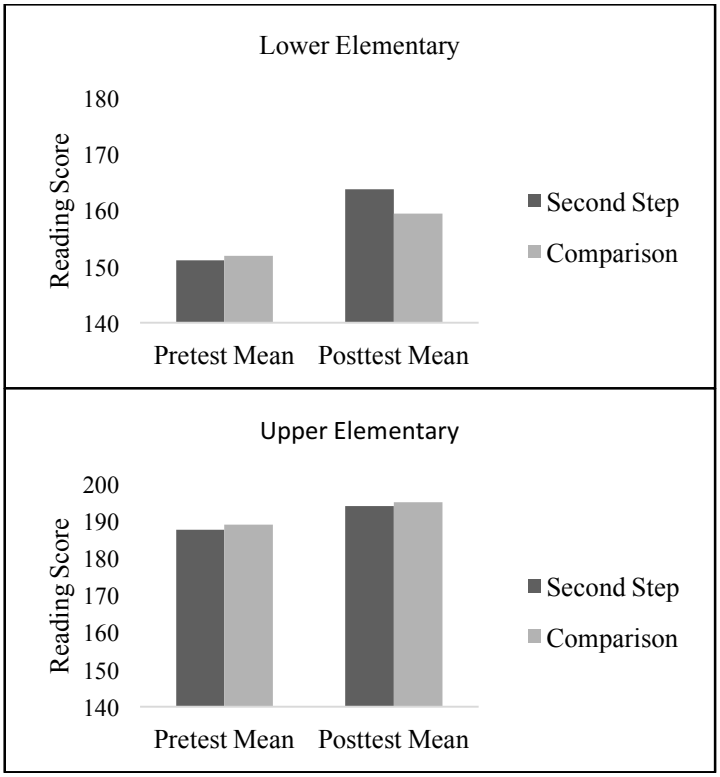


Figure 6. *Simple plot for interaction effects between intervention group by grade level on reading achievement*

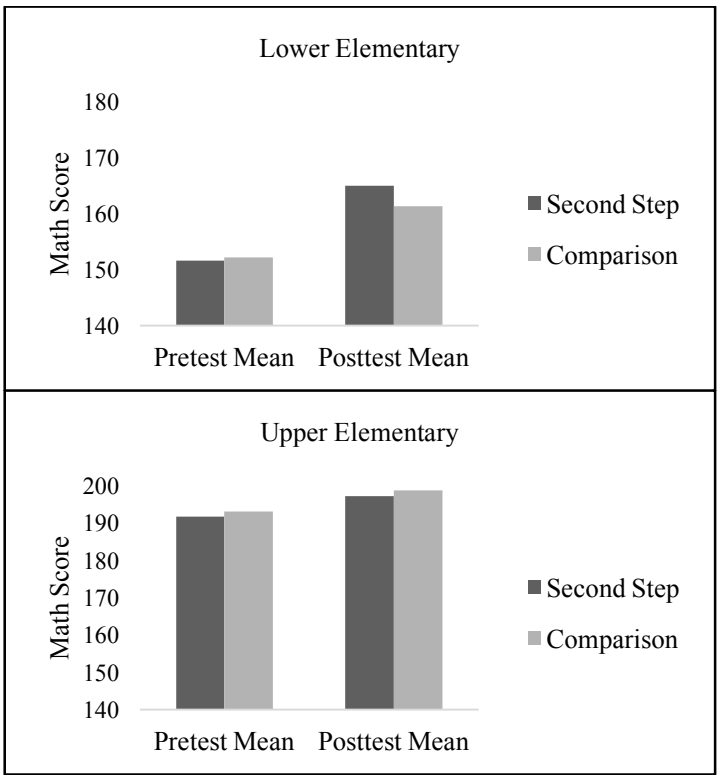


Figure 7. *Simple plot for interaction effects between intervention group and grade level on math achievement*

Overall, improvement in reading achievement did not significantly differ across the three levels of learning risk, $F(2, 351)=2.79$, $p>.05$. Learning risk did, however, moderate the effect of intervention group on improvement in reading scores from pretest to posttest, $F(2, 351)=3.38$, $p = .035$, $d = .28$. Results from simple effects tests of the significant intervention group by learning risk interaction are presented in Table 20. As anticipated, moderate learning risk students in *Second Step* classrooms showed greater improvements in reading achievement than moderate learning risk students in comparison classrooms and low learning risk students in *Second Step* classrooms did not demonstrate greater gains in reading scores than counterparts in comparison classrooms. Contrary to expectations, students in *Second Step* classrooms demonstrating the highest level of learning risk did not demonstrate significantly greater improvements in reading

achievement than high learning risk students in comparison classrooms. The significant interaction effect of intervention group by learning risk on improvements in reading achievement is illustrated in Figure 8.

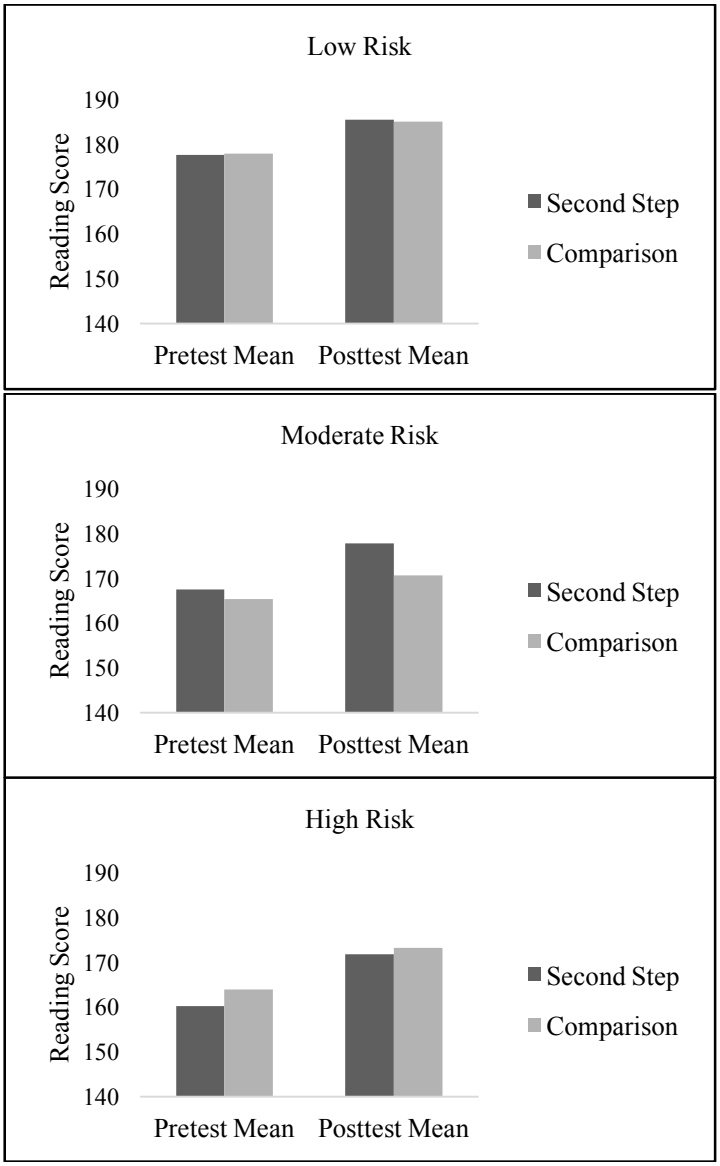


Figure 8. *Simple plot for interaction effects between intervention group by learning risk on reading achievement*

Table 20

*Comparisons of Mean Differences in Reading Achievement by Learning Risk and Intervention Group*

| Intervention Group Comparison by Learning Risk | Estimated Mean Difference | Standard Error of Difference | Bonferroni Adjusted 95% CI |
|---|---|---|---|
| Low Learning Risk | | | |
| *Second Step* vs. Comparison | .148 | 1.69 | -3.18, 3.47 |
| Moderate Learning Risk | | | |
| *Second Step* vs. Comparison | 5.35* | 1.47 | 2.46, 8.25 |
| High Learning Risk | | | |
| *Second Step* vs. Comparison | 1.37 | 1.76 | -4.83, 2.09 |

*Note*. Comparisons based upon ANCOVA adjusted means controlling for Baseline Reading Achievement mean of 167.90.
* $p < .05$, where p-values are adjusted using the Bonferroni method.

A significant main effect for learning risk on math achievement was also found, $F(2, 351)=4.65$, $p = .035$, $d =.33$. Pairwise comparisons of overall differences in math improvement from pretest to posttest across the three levels of learning risk are presented in Table 21. In contrast to reading achievement scores, student level of learning risk at baseline did not significantly moderate the effect of *Second Step* on improvements in math achievement scores from pretest to posttest as expected, $F(2, 351)=1.33$, $p>.05$. Results revealed significant mean differences for only one pair; low learning risk students showed significantly greater improvement in math scores than students demonstrating high learning risk. Significant mean differences between low and moderate learning risk students or moderate and high learning risk students were not found.

Table 21

Comparisons of Mean Differences in Math Achievement by Learning Risk

| Learning Risk Comparison | Estimated Mean Difference | Standard Error of Difference | Bonferroni Adjusted 95% CI |
|---|---|---|---|
| Low vs. Moderate | 1.37 | 1.28 | -1.13, 3.88 |
| Low vs. High | 2.92* | 1.42 | .121, 5.72 |
| Moderate vs. High | 1.55 | 1.31 | -1.02, 4.11 |

*Note*. Comparisons based upon ANCOVA adjusted means controlling for Baseline Math Achievement mean of 169.79.
* p < .05, where p-values are adjusted using the Bonferroni method* p < .05, where p-values are adjusted using the Bonferroni method.

These findings partially support the hypothesis that students demonstrating a higher level of learning risk at baseline would benefit more from *Second Step* intervention than students demonstrating lower learning risk (Hypothesis 2b). Among students in *Second Step* classrooms, those students categorized as demonstrating a moderate level of learning risk showed greater improvements in reading achievement than both low learning risk and high learning risk students. Students demonstrating the highest level of learning risk, however, did not show greater reading gains than students demonstrating lower levels of learning risk (low, moderate). For math, level of learning risk did not moderate the impact of intervention group on improvements in math achievement from pretest to posttest as hypothesized.

ANCOVA results did not yield a significant main effect for gender on improvements in reading achievement, $F(1,351)=.20$, $p>.05$, or math achievement, $F(1,351)=0.064$, $p>.05$. Furthermore, gender did not moderate the effect of intervention group on improvements in reading scores, $F(1,351)=0.02$, $p>.05$, or math scores, $F(1,351)=0.170$, $p>.05$, from pretest to posttest. The hypothesis that the benefit of *Second Step* participation on improvements in math and reading scores would be greater for boys than girls (Hypothesis 2c) was not supported by these findings. Descriptive statistics disaggregated by intervention group for reading and math

achievement by grade, learning risk, and gender are presented in Tables 22, 23, and 24 respectively.

Table 22

*Descriptive Statistics for Academic Achievement by Intervention Group and Grade*

| Group | Elementary Grade | *n* | Reading Achievement | | Math Achievement | |
|---|---|---|---|---|---|---|
| | | | *Adj M* | *SD* | *Adj M* | *SD* |
| *Second Step* | Lower | 133 | 176.57 | 14.73 | 177.59 | 15.99 |
| | Upper | 105 | 179.45 | 13.30 | 182.48 | 12.78 |
| Comparison | Lower | 67 | 171.55 | 15.98 | 173.59 | 17.47 |
| | Upper | 59 | 179.88 | 13.29 | 182.71 | 11.00 |

*Note*. Adjusted mean based upon Baseline Reading and Math Achievement scores.

Table 23

*Descriptive Statistics for Academic Achievement by Intervention Group and Learning Risk*

| Group | Learning Risk | *n* | Reading Achievement | | Math Achievement | |
|---|---|---|---|---|---|---|
| | | | *Adj M* | *SD* | *Adj M* | *SD* |
| *Second Step* | Low | 57 | 178.39 | 20.27 | 181.55 | 18.69 |
| | Moderate | 92 | 178.17 | 20.39 | 181.03 | 21.16 |
| | High | 89 | 177.46 | 20.22 | 177.48 | 21.84 |
| Comparison | Low | 44 | 178.03 | 22.83 | 181.04 | 23.33 |
| | Moderate | 51 | 173.03 | 23.79 | 176.64 | 26.83 |
| | High | 31 | 175.03 | 18.51 | 176.77 | 17.58 |

*Note*. Adjusted mean based upon Baseline Reading and Math Achievement scores.

Table 24

*Descriptive Statistics for Academic Achievement by Intervention Group and Gender*

| Group | Gender | *n* | Social Emotional Competence | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | SLT | | EPT | | EMT | |
| | | | *Adj M* | *SD* | *Adj M* | *SD* | *Adj M* | *SD* |
| *Second Step* | Male | 126 | 46.91 | 10.31 | 45.67 | 10.38 | 47.00 | 10.54 |
| | Female | 112 | 48.68 | 10.38 | 48.91 | 10.05 | 49.65 | 10.42 |
| Comparison | Male | 60 | 47.28 | 10.63 | 46.84 | 8.51 | 48.76 | 9.40 |
| | Female | 66 | 46.91 | 10.23 | 48.87 | 9.90 | 48.45 | 10.16 |

*Note*. Adjusted mean based upon Baseline Reading and Math Achievement scores.

# CHAPTER 5

# DISCUSSION

A growing body of research indicates that social-emotional competence and academic achievement are interwoven and that integrated instruction and support in both areas can maximize student success (Zins & Elias, 2007) and reduce the risk of maladjustment (Elias et al., 1997; Zins et al., 2004). This investigation was guided by the SEL conceptual framework for the organization and integration of school-based prevention programs. The framework holds that school-based SEL programs can lead to immediate improvements in the classroom environment and student social-emotional competence, establishing the mechanisms through which more distal improvements in academic performance are realized. Full implementation of the model of integrated educational programming as conceptualized in the SEL framework and applied through MTSS practices was beyond the scope of the present project. Rather, *Second Step* programming and social-emotional assessment were confined to Tier I and were minimally integrated with existing academic RTI practices. The study represents initial steps in examining the potential benefit of integrating universal SEL programming into an existing tiered approach to elementary education.

This study tested the hypotheses that students participating in *Second Step,* a universal, skills-focused SEL curriculum, would show greater improvements in social-emotional competence and academic achievement than students not receiving the intervention. The hypothesis that student response to *Second Step* would differ by level of baseline learning risk and gender was also tested. This chapter interprets key findings in the context of prior research and the theoretical framework guiding the investigation. Limitations of the study, as well as implications for practice and future research, are also discussed.

## *Second Step* and Social-Emotional Competence

Study results did not support the hypothesis that *Second Step* participation would result in greater gains in social-emotional competence for all students. Post-hoc analysis, however, revealed differential benefits when examined by grade. Lower elementary students in *Second Step* classrooms showed significantly greater improvements in social-emotional competence than peers in comparison classrooms (Cohen's $d = .4$). Although the effect size might seem small, in the context of prior research, the present results for the lower elementary grades are comparable to outcomes from meta-analyses of school-based, universal SEL interventions (Durlak et al, 2011; Payton et al., 2008). Translated into a percentile rank for the average *Second Step* student to the average comparison student, the effect size for social-emotional competence suggests meaningful benefits for lower elementary students following *Second Step* participation. The average lower elementary student in *Second Step* classrooms showed a 16-percentile-point gain in social-emotional competence compared to the average lower elementary student in a comparison classrooms. From a practical standpoint, the effects observed in the present study reflect a level of improvement in social-emotional competence that likely generalizes into valuable and noticeable differences in lower elementary classroom settings.

Similar intervention benefits were not observed in the upper grades. This finding was not predicted and is inconsistent with large-scale reviews of the broader SEL literature reporting no link between student response to intervention and grade level (Durlak et al., 2011; Payton et al., 2008). The discrepancy in findings may be related to the highly selective sample from which the present study data were drawn. The differential effects of SEL intervention by grade level were observed in a markedly homogeneous student population embedded within a common school culture and exposed to similar community factors. In contrast, meta-analyses results were based

on comparison across multiple studies representing varying geographical settings, school cultures, student demographics, intervention programs, and implementation methods (Durlak et al., 2011; Payton et al., 2008). Although meta-analysis affords greater statistical power and ability to extrapolate to the general population, the pooling of multiple studies may result in a more heterogeneous study populations and variables that mask sub group differences such as the differential response to intervention by grade observed in the present study. The current findings add to the research base regarding the differential benefits that lower and upper elementary students from socioeconomically disadvantaged communities might derive from participation in universal SEL intervention like *Second Step*.

Notably, the differential effects of *Second Step* participation in the lower grades were specific to the development of empathy skills. Improvements in lower elementary students' skills for learning and emotion management did not significantly differ between treatment groups. Thus, not only did students differ in their response to *Second Step* depending on grade level, the intervention also differentially targeted key social-emotional competencies. This finding is not surprising given the scope and sequence of skill development inherent in the *Second Step* curriculum and, by extension, reflected in the DESSA-SSE and the present study. *Second Step* defines empathy skills as the ability to identify emotions in self and others, label those emotions, and take on others' perspectives (Committee for Children, 2011). These skills are considered foundational to the development of emotional literacy and critical interpersonal competencies, two important factors in the development of more complex social-emotional skills such as emotion management and problem solving. Compared to other competencies targeted by the *Second Step* curriculum (i.e., skills for learning, emotion management), the development of empathy skills relies heavily on the acquisition of content knowledge and language skills and,

much like social studies or science, are most readily demonstrated and measured through traditional classroom practices (i.e., class discussion, question/response, partner share). Competencies such as skills for learning and emotion management, on the other hand, represent a more complex subset of competencies that require the integration of multiple skills and demand more time and opportunity for practice before they can be competently generalized to the school setting.

Considering the SEL conceptual framework, the current findings suggest that empathy skills may represent an immediate outcome that lays the groundwork for other, more distally situated social-emotional competencies such as skills for learning and emotion management. Findings from a largescale review of the school-based, SEL intervention research indicating more robust effects on improvements in content-related knowledge and skills compared to higher level competencies (e.g., emotion management, problem solving) lend support to this argument (Durlak et al., 2011; Peyton et al., 2008). These findings suggest that social-emotional competence skills targeted by SEL intervention may not develop simultaneously as suggested by the *Second Step* logic model and SEL conceptual framework. Rather, foundational skills that rely heavily on the acquisition of content knowledge may develop more quickly and be more readily observable to teachers in the classroom setting and more conducive to rating scale measurement. Competencies that demand the integration of foundational and newly acquired skills may constitute more distal, secondary outcomes that will develop over time as they are generalized across school settings and situations.

Differential effects of intervention by grade have not been reported in large-scale reviews of SEL intervention research or individual *Second Step* studies. However, the observed benefit for younger students is perhaps not that surprising given what is known about early intervention,

particularly in the context of school communities characterized by multiple risk indicators. A foundational tenet of the SEL conceptual framework holds that social-emotional competence skills are malleable and can be developed and reinforced through direct SEL instruction and enhancement of classroom social environment (Elias et al., 1997; Greenberg et al., 2003; Zins & Elias, 2006; Zins et al., 2004). However, educational histories marked by chronic socioeconomic disadvantage and exposure to multiple neighborhood and family risk factors may set students on behavioral, social, and academic trajectories that become more firmly established and less amenable to the positive changes associated with SEL intervention as they progress through the elementary grades (Roeser, Eccles, & Freedman-Doan, 1999). The present findings suggest that the malleability of social-emotional and behavioral skills may have unique developmental implications within the context of socioeconomic disadvantage. It could be that, for upper elementary students facing multiple neighborhood and school risk factors, universally delivered SEL intervention may be inadequate to remediate skills that have grown resistant to change over time. Older students from communities characterized by a high level of risk might require more intense and targeted Tier II intervention (e.g., increased frequency and duration delivered in the small group setting) to show similar improvements in social-emotional competence skills as their younger schoolmates.

Although differential benefits by grade were not predicted, it was hypothesized that students demonstrating a higher level of learning risk at baseline would have the most to gain from *Second Step* participation, resulting in greater gains in social emotional competence following intervention compared to peers at less risk of learning difficulty. Contrary to hypothesized outcomes and previous research (Frey et al., 2005; Low et al., 2015; Taub, 2001), *Second Step* did not produce larger gains in social-emotional competence among students at

higher levels of learning risk. This unexpected result might be due to differences in the number and quality of risk factors represented in the current sample compared to previous studies. The present study involved a highly selective sample, drawn from one school community characterized by neighborhood, family, and student factors historically linked to weaker social, emotional, and behavioral outcomes. By comparison, previous *Second Step* studies indicating greater benefits for students initially lower in social-emotional skills (Frey et al., 2005; Low et al., 2015; Taub, 2001) reported predominantly White, non-urban, and socioeconomically diverse samples, a demographic profile generally found to be at less risk for negative school outcomes. It could be that the anticipated differential intervention benefits for students at greater risk for learning difficulty were overwhelmed by the multitude of additional neighborhood and school risks faced by students in the current sample.

The lack of differential benefits of *Second Step* by level of learning risk may also be explained by differences in the current study's conceptualization and measurement of learning risk compared to previous SEL intervention studies. The present study incorporated academic and social-emotional indicators in categorizing students' level of learning risk. This expanded approach likely captured a greater breadth and intensity of potential learning difficulties than previous studies that relied solely on measures of social-emotional competence (e.g., Frey et al., 2005; Low et al., 2015; Taub, 2001). Consideration of the reciprocal nature of academic and social-emotional development may be particularly relevant for student learning outcomes in the context of high risk communities. For example, children from high-poverty, urban communities, are at greater risk for language delays (e.g., vocabulary, comprehension, pragmatics) and cognitive difficulties (e.g., memory, visual-spatial skills, attention) that can interfere with the ability to engage with SEL instruction, comprehend and recall program content, and successfully

demonstrate acquired skills in the classroom setting (e.g., Norman & Farah, 2005; Hart & Risley, 1995). Youth from socioeconomically disadvantaged communities face a multitude of developmental risk factors that can interfere with the ability to access and engage with classroom instruction and negatively impact academic development. Given the mutually reinforcing relationship between social-emotional and academic development, more intensive Tier II SEL intervention, in addition to universal programming, may be necessary to address the needs of students at greatest risk for negative school outcomes in high-poverty, urban school settings.

Boys, on average, have been found to demonstrate lower levels of social-emotional competence than girls (Bosacki & Moore, 2004; Brown & Dunn, 1996; Else-Quest et al., 2006; Garner & Waajid, 2012; Merrell et a., 2011). Because boys appear to have more difficulty developing social-emotional skills and are at greater risk for deficits in this area, it was hypothesized that boys would benefit more from SEL participation than their more social-emotionally competent female peers. Contrary to predicted outcomes and findings from earlier SEL studies (Aber et al., 1998; Belfield et al., 2006; Miller et al., 2010; Muenning et al., 2008; Frey et al., 2005), boys did not show greater improvements than girls in social-emotional competence skills. As with the absence of greater intervention benefits for students demonstrating a higher level of learning risk, the failure to produce greater improvements in social-emotional competence skills for boys following SEL program participation may be related to the multiple neighborhood, family, and school risks faced by students in the current sample. Although boys may have more to gain from SEL intervention given their lower social-emotional skills at baseline, the multiple risks faced by boys from socioeconomically disadvantaged neighborhoods and families may prove too detrimental to the ability to access SEL instruction and demonstrate improvements that exceed those of girls. Although this finding is contrary to

prediction and past research, the result seems to confirm recent findings from meta-analysis of school-based SEL research concluding that, although girls demonstrate higher social-emotional competence than boys, boys and girls benefit similarly from participation in SEL programming (Durlak et al., 2011; Payton et al. 2008).

### *Second Step* and Academic Achievement

Overall, students in *Second Step* classrooms showed significantly greater improvements in reading and math scores from pretest to posttest than students in comparison classrooms. This main effect for intervention group, however, significantly depended on student grade level. As with social-emotional outcomes, lower elementary students in *Second Step* classrooms showed greater gains in reading (Cohen's $d = .26$) achievement and math achievement (Cohen's $d = .29$) than comparison students. Although these effect sizes are small according Cohen's (1988) conventions, when interpreted in the context of prior research, the results for lower elementary reading and math achievement are comparable to the results of meta-analyses of universal SEL interventions (Durlak et al, 2011; Payton et al., 2008) as well educational interventions (Hill et al., 2007). In terms of practical value, results suggest that *Second Step* participation in the lower elementary grades can generate meaningful improvement in students' reading and math achievement. When translated into a percentile rank, the average lower elementary student in *Second Step* classrooms showed a 10-percentile-point gain in reading achievement and an 11-percentile-point gain in math achievement compared to the average lower elementary student in a comparison classrooms. Alternatively, the average lower elementary student in comparison classrooms would demonstrate a 10-percentile-point (reading) to 11-percentile-point (math) gain in achievement test scores if they had participated in *Second Step* programming. From a practical standpoint, therefore, the seemingly small effect sizes yielded in the lower elementary grades for

translate into valuable improvements in reading and math performance in the classroom setting. Similar effects in the upper elementary grades for academic achievement, however, were not observed.

The simultaneous improvements observed in both social-emotional competence and academic achievement for lower elementary students in *Second Step* classrooms support the SEL theoretical framework that describes the mechanisms by which the acquisition of social-emotional competence skills might influence academic performance. For example, preparing for and performing well on tests requires social-emotional skills such as self-control, cooperative interaction, and appropriate assertiveness and problem solving. The social-emotional skills supported by SEL intervention allow students to better focus on academic tasks despite learning difficulties or other risk factors (Masten, 1994). This result also extends the *Second Step* research to include improvements in academic achievement scores as an anticipated outcome of the program; to date, published research has not reported improvements in reading and math scores as a benefit of *Second Step* participation. This finding is consistent with predictions and confirms prior literature indicating the positive effects of SEL curricula on gains in academic performance (Durlak et al., 2011; Payton et al. 2008).

Although this finding aligns with empirical and theoretical expectations, the greater benefit for lower elementary students on improvements in academic achievement was not predicted. As with the moderating effect of grade on improvements in social-emotional competence skills, the differential benefit of *Second Step* for younger students suggests that the mechanisms of school-based SEL intervention through which improvements in academic outcomes are realized may have unique developmental considerations within the context of socioeconomic disadvantage. The present findings suggest that when universal SEL

programming is implemented in school communities characterized by socioeconomic disadvantage, academic skills in the lower grades are significantly more amenable to improvements than academic skills in the upper grades. The differential effects of intervention by grade might be the result of the cumulative risks associated with socioeconomic disadvantage that, over time, place students on increasingly persistent pathways of social-emotional, behavioral, and learning difficulties that grow progressively resistant to change as students progress through the grade (Roeser et al., 1999). As with the development of social-emotional competence skills, not all students will respond similarly to school-wide SEL programming. These results suggest that universal SEL programming may not be sufficient to meet the social-emotional, behavioral, and academic needs of students facing multiple risks to learning and school success. In such cases, more intensive Tier II intervention may be needed to set to set the most at-risk student on a path toward positive learning outcomes and school success.

Alternatively, the lack of improvement in academic outcomes for upper elementary students may have more to do with time than the ineffectiveness of the intervention with this subgroup of students. From the SEL conceptual framework, academic achievement is considered a secondary, or more distal, outcome of school-based intervention. In the present study, growth was measured over the course of a 16-week period. It could be the case that upper elementary students did benefit from *Second Step* participation but adequate time was not allowed for the intervention effects to translate into significant improvements in the secondary outcomes such as academic achievement scores.

As hypothesized, the positive impact of *Second Step* on improvements in achievement scores significantly depended on the level of learning risk that students demonstrated at the beginning of the school year. *Second Step* students demonstrating moderate learning risk showed

significantly greater gains in reading achievement scores than counterparts in comparison classrooms. Conversely, *Second Step* students categorized as low in learning risk showed similar improvements in reading scores as low risk students in comparison classrooms as predicted. Significant differences were not found, however, between *Second Step* students categorized as demonstrating the highest level of learning risk and similar students in comparison classrooms. As posited in the previous discussion of the effect of learning risk on social-emotional outcomes in the context of socioeconomic disadvantage, it could be that students categorized as high in learning risk in the present sample exceeded a critical threshold of risk, preventing them from realizing the differential effects of SEL intervention enjoyed by moderately at-risk peers. This finding suggests that universal SEL may not be adequate to address the needs of students at greatest risk for negative school outcomes due to socioeconomic disadvantage. As with other subgroups demonstrating a lack of response to Tier I SEL intervention in the present study, students categorized as highest in learning risk may require more intensive SEL intervention to show meaningful improvement in academic achievement. These findings extend previous *Second Step* research indicating the moderating effect of learning risk on improvements in social-emotional competence skills by including academic achievement as an outcome measure. These results are relatively consistent with previous research suggesting that students demonstrating moderate levels of learning risk at the start of the school year experience greater benefit from SEL intervention than more proficient peers (Frey et al., 2005; Low et al., 2015; Taub, 2001).

## Limitations of the Study

Although the findings reported here are encouraging, several limitations should be noted while evaluating the results. One limitation stems from the use of a quasi-experimental design

rather than a randomized controlled trial. Teachers were not randomly assigned to intervention classrooms; instead, they volunteered or were nominated by administration to implement *Second Step* in their classrooms. This limitation makes causal inferences between intervention group and improvements in student outcomes difficult to make. The observed effects may be due to specific dimensions of the *Second Step* curriculum, teacher characteristics, quality of classroom environment, effectiveness of behavior management, quality of intervention implementation or some combination of these and other factors. Nonetheless, there are several reasons for confidence in the findings. First, students were not assigned to classrooms based on the *Second Step* program. Thus, there was no reason to expect that children who received the program were systematically different from peers in the wait-list comparison classrooms. Although statistical differences between groups on baseline social-emotional competence scores were indicated, the actual mean differences between the groups were small and favored comparison classrooms. Significant baseline differences in academic achievement scores and demographic factors between the groups were not found. Data analysis relied on ANCOVA/MANCOVA techniques that included baseline measurement of outcome variables as covariates to statistically adjust the posttest means for differences among the intervention groups at pretest.

Secondly, because quality of implementation and performance feedback data were not collected, it is difficult to determine to what degree *Second Step* was delivered with fidelity and improvements in student outcomes can be reasonably attributed to the intervention. There is ample research linking the effectiveness of universal SEL programs to important implementation features such as adherence, dosage, preparedness of interventionist, responsiveness of participants, and degree of content differentiation (Durlak et al., 2011; Low et al., 2015; Low, Smolkowski, & Cook, 2016). The failure to consider the quality of intervention implementation

makes it difficult to arrive at accurate conclusions about the effectiveness of *Second Step* or to replicate this study and gain similar results (Gresham, MacMillan, Beebe-Frankenberger, & Bocian, 2000). The quality of intervention implementation is particularly relevant in the context of the MTSS framework that assumes intervention integrity when determining student progress and the need for adjustments in programming. It is important that future research include both direct and indirect measures of treatment integrity to ensure that student progress can be reliably traced back to intervention.

Third, interpretation of key findings is limited due to the study's reliance on existing data and the inability to consider multiple sources when measuring outcome variables. Determination of changes in social-emotional competence from pretest to posttest relied solely on teacher-ratings of individual student functioning. While teacher perceptions of gains in student competencies are critical to understanding the effect of SEL intervention, use of behavioral rating scales like the DESSA-SSE have been criticized for potential introduction of non-random measurement error in assessment scores attributable to rater bias (Elliott, Frey, & Davies, 2015; Hoyt & Kerns, 1999). Future research should consider multiple sources of information such as behavioral observation, direct behavior rating, student self-report, peer reports, or parent indicators to gain a more comprehensive and reliable understanding of social-emotional benefits of participation in *Second Step*.

As with limitations related to measurement of SEL outcomes, the current study also relied solely on student NWEA Measure of Academic Progress (MAP) data when determining gains in academic achievement following *Second Step* participation. Although the MAP is regarded as a valid measure of student academic achievement and is widely used in benchmarking assessment practices across the country, reliance on the assessment as the sole

outcome measure in evaluating the effects SEL intervention across the elementary grades may be problematic. For example, the benefits associated with *Second Step* may be more applicable to the fundamental, rote reading development associated with letter recognition and memorization skills prevalent in the early elementary grades rather than the more complex, higher level skills encountered in the upper elementary grades. It may be that the function that the MAP was designed to serve in educational programming explains the differential gains observed in the lower grades rather than intervention effects. To avoid misinterpretation of study results, future research should consider multiple measures of academic achievement such as curriculum-based measurement, classroom performance, individual achievement testing, or report card grades.

Lastly, the present study considers the impact of SEL intervention on individual students nested within individual classrooms in one elementary school. Because classmates share the same teacher and classroom environment, they are likely to be more comparable to each other in certain areas than to students in other classrooms. This clustering of students within classrooms can result in non-independence of subjects, a violation of a key assumption of analytic methods such as ANCOVA. This violation can bias the statistical tests used to identify intervention effects and lead to incorrect conclusions about the statistical significance of observed relationships. When analyzing nested data like that in the present study, hierarchical linear modeling (HLM) is recommended to address the issues associated with non-independence of subjects by controlling for confounding factors such as teacher and classroom effects (Raudenbush & Bryk, 2002). Unfortunately, the small number of classrooms under examination in the present study did not provide sufficient statistical power to utilize HLM methods as recommended. Therefore, analyses were conducted at the individual level even though students

were nested within classroom. For this reason, study results should be interpreted with caution given the potential for bias.

## Future Directions and Implications for Practice

Despite the above-mentioned limitations, results of this study both replicate and extend what is known about the impact of school-based, SEL programs on student outcomes in several specific ways. First, the findings extend support for SEL programs beyond highly-controlled trials to implementation in an authentic practice setting. Few studies have focused on evaluating the effectiveness of SEL programs under real-world educational conditions (Merrell & Gueldner, 2010). The findings confirm previous research demonstrating the feasibility of teacher-delivered SEL programs resulting in improvement in student outcomes, particularly academic gains (Durlak et al., 2011; Payton et al., 2008). Although not a randomized controlled trial, the study is high in ecological validity and is particularly relevant for urban school settings with limited access to resources and supports to address the social-emotional and academic needs of general education students. Future research should continue to explore the transportability of effective SEL programming to contexts that reflect conditions typically found in school communities. These efforts should focus on examination of feasible methods for implementing SEL intervention, measuring implementation fidelity, and monitoring student progress toward outcome goals.

Secondly, this study responds to the call for SEL research to go beyond examination of simple main effects to identify factors that might moderate the effect of intervention on student outcomes (Durlak et al. 2011, Payton et al., 2008). This research provides preliminary exploration into a person-centered approach to defining risk status through the integration of academic and social-emotional data. Such practices within an MTSS model of educational

programming might produce “profiles” of student risk to assist teams in designing prevention and intervention programs in a more effective and strategic way. For example, a student presenting with a profile indicating both social-emotional and academic risk may be at greater risk and require more intensive intervention based on level of need. Future research should continue to investigate ways that schools might capitalize on the extensive research base linking academic performance and social-emotional competence to improve the predictive validity of universal screening practices and enhance the capacity to effectively match student need to intervention.

This research also contributes to the growing literature suggesting that, in addition to serving a preventative role by promoting social-emotional competence for all students, SEL programs can also promote protective factors for students already demonstrating school difficulties or in jeopardy of negative outcomes due to school and community risk factors. With the potential to be implemented across grades and schools within a district, SEL programs may be particularly effective at ameliorating environmental risk factors, such as limited staff SEL development or negative school climate, that can interfere with academic performance and social-emotional development in high risk communities. Much of the SEL research has focused on student-level outcomes such as behavior rating scales, achievement scores, and direct observation of classroom behavior. Less attention has been paid to investigating valid and feasible measurement of the environmental mechanisms that are hypothesized to link SEL programs to positive school and learning outcomes. Future research focused on the identification and measurement of environmental protective factors that link SEL programming, and positive learning outcomes may prove to be particularly beneficial as schools prepare to implement system-wide SEL programing that is currently being proposed at the state and federal levels.

In conclusion, the present study is important in that it provides support for the SEL framework and the idea that students participating in school-based SEL programs such as *Second Step* can demonstrate significant improvements in academic performance and social-emotional skills (Durlak et al., 2011; Payton et al., 2008). The study also contributes to the growing body of literature indicating that social-emotional competence and academic achievement are interwoven and that integrated instruction and support in both areas can maximize student success (Zins & Elias, 2007). This research links SEL programming to improvements in academic achievement, providing the necessary justification for evidence-based SEL programming to be fully enmeshed in the everyday practices and routines of schools.

# APPENDIX

# APPENDIX

MICHIGAN STATE UNIVERSITY

**Determined Not "Human Subjects"**

2/25/16

Laurie Benson
Email: bensonl6@msu.edu

Re: Determination of Human Subject Research
Universal Social Emotional Learning Curriculum and Screening: Evauating the Effects on Elementary Students' Competence and Academic Achievement; IRB# 16-226

Dear Laurie:

It has been determined that the activity described in your application to the IRB submitted 2/10/16 does not meet the definition of "human subjects" as defined by the U.S. Department of Health and Human Services (DHHS) regulations for the protection of human research subjects.

**Human Subject**
For DHHS, "human subject" means "a living individual about whom an investigator (whether professional or student) conducting research obtains: (1) Data through intervention or interaction with the individual, or (2) Identifiable private information." [45 CFR 46.102(f)].

After reviewing the information you have provided, it has been determined that:
☐ Living individuals are not involved
☐ The activity is not "about" the living individual
☒ Will not obtain data through interaction or intervention or private identifiable information

You have indicated that you will be analyzing de-identified data that was not collected for research purposes, and that will be provided to you by a school district without identifiers.

Hence, your activity does not involve human subjects.

Therefore, the federal regulations for the protection of human subjects would not apply to your project and you do not need MSU IRB approval to proceed. However, please note that while MSU IRB approval is not required, other federal, state, or local regulations or requirements or ethical or professional standards may still be applicable based on your activity.

If any of these circumstances change, please contact the IRB as your activity may involve human subject research and require IRB approval.

If you have any further questions, please contact the MSU IRB office at 517-355-2180.

Sincerely,

Rebecca Gore

Rebecca Gore, CIP
Institutional Review Board Manager

cc: Evelyn Oka (evoka@msu.edu)

Office of Regulatory Affairs
Human Research Protection Programs

Biomedical & Health Institutional Review Board (BIRB)

Community Research Institutional Review Board (CRIRB)

Social Science Behavioral/Education Institutional Review Board (SIRB)

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# REFERENCES

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Aber, J. L., Jones, S. M., Brown, J. L., Chaudry, N., & Samples, F. (1998). Resolving conflict creatively: Evaluating the developmental effects of a school-based violence prevention program in neighborhood and classroom context. *Development and Psychopathology*, *10*(02), 187-213. doi:10.1017/S0954579498001576

Adelman, H. S., & Taylor, L. (2003). Toward a comprehensive policy vision for mental health in schools. In M. D. Weist, S. W. Evans, & N. A. Lever (Eds.), *Handbook of school mental health advancing practice and research* (pp. 23-43). New York: Kluwer Academic/Plenum.

Albers, C. A., Glover, T. A., & Kratochwill, T. R. (2007). Where are we, and where do we go now?: Universal screening for enhanced educational and mental health outcomes. *Journal of School Psychology*, *45*(2), 257-263. doi:10.1016/j.jsp.2006.12.003

Arsenio, W. F., Cooperman, S., & Lover, A. (2000). Affective predictors of preschoolers' aggression and peer acceptance: Direct and indirect effects. *Developmental Psychology, 36*, 438-448.

Barkley, R. A. (1997). *ADHD and the nature of self-control*. New York: Guilford Publications.

Barkley, R. A. (2004). Attention-deficit/hyperactivity disorder and self-regulation: Taking an evolutionary perspective on executive functioning. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 301-323). New York: Guilford Press.

Batsche, G. M., Castillo, J. M., Dixon, D. N., & Forde, S. (2008). Best practices in designing, implementing, and evaluating quality interventions. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology V*, (pp. 177-193). Bethesda, MD: National Association of School Psychologists.

Belfield, C. R., Nores, M., Barnett, S. W., & Schweinhart, L. (2006). Cost-benefit analysis of the High Scope Perry Preschool Program using age 40 follow-up data. *Journal of Human Resources, 41*, 283-301.

Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist, 57*, 111-117.

Blair, C., & Razza, R. P. (2007). Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development*, *78(*2), 647-663.

Blum, R. W., Libbey, H. P., Bishop, J. H., & Bishop, M. (2004). School connectedness–strengthening health and education outcomes for teenagers. *Journal of School Health*, *74*(7), 231-235. doi:10.1111/j.1746-1561.2004.tb08278.x

Bosacki, S. L., & Moore, C. (2004). Preschoolers' understanding of simple and complex emotions: Links with gender and language. *Sex Roles*, *50*(9-10), 659-675. doi:10.1023/B:SERS.0000027568.26966.27

Bradshaw, C. P., Bottiani, J. H., Osher, D., & Sugai, G. (2014). The integration of positive behavioral interventions and supports and social and emotional learning. In *Handbook of school mental health* (pp. 101-118). New York: Springer. doi:10.1007/978-1-4614-7624-5_8

Brady, K. T., Myrick, H., & McElroy, S. (1998). The relationship between substance use disorders, impulse control disorders, and pathological aggression. *American Journal of Addictions, 7*, 221-230.

Brown, J. R., & Dunn, J. (1996). Continuities in emotion understanding from three to six years. *Child Development*, *67*(3), 789-802. doi:10.2307/1131861

Castillo, J. M., Batche, G. M., Curtis, M. J., Stockslager, K., March, A., & Minch, D. (2010). Problem Solving/Response to Intervention Evaluation Tool Technical Assistance Manual. Retrieved March 29, 2014, from http://floridarti.usf.edu/resources/tools/ta_manual/index.heml

Cohen, D., & Strayer, J. (1996). Empathy in conduct-disordered and comparison youth. *Developmental Psychology, 32*, 988-998.

Cohen J, 1988. *Statistical power analysis for the behavioral sciences*. Hillsdale, New Jersey: Erlbaum.

Collaborative for Academic, Social, and Emotional Learning. (2013). *CASEL guide: Effective social and emotional learning programs.* Chicago, IL: Author.

Collaborative for Academic, Social, and Emotional Learning. (2003). *Safe and sound: An educational leader's guide to evidence-based social and emotional learning programs.* Chicago, IL: Author.

Cook, B. G., Burns, M., Browning-Wright, D., & Gresham, F. M. (2010). *Transforming school psychology in the RTI era: A guide for administrators and school psychologists*. Palm Beach: LRP Publications.

Cook, C. R., Volpe, R. J., & Livanis, A. (2010). Constructing a roadmap for future universal screening research beyond academics. *Assessment for Effective Intervention*, *35*(4), 197-205. doi:10.1177/1534508410379842

Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin*, *115*(1), 74. doi:10.1037/0033-2909.115.1.74

Demetriou, A., Christou, C., Spanoudis, G., & Platsidou, M. (2002). *Monographs of the Society for Research in Child Development, 67(1),* 1-38.

Denham, S. A., Bassett, H. H., & Zinsser, K. (2012). Early childhood teachers as socializers of young children's emotional competence. *Early Childhood Education Journal, 40*, 137-143.

Denham, S. A., McKinley, M., Couchoud, E. A. & Holt, R. (1990), Emotional and behavioral predictors of preschool peer ratings. *Child Development, 61*, 1145–1152. doi:10.1111/j.1467-8624.1990.tb02848.x

Deno, S. L., & Fuchs, L. S. (1987). Developing curriculum-based measurement systems for data-based special education problem solving. *Focus on Exceptional Children, 19*(8*)*, 1-16.

DiPerna, J. C., & Elliot, S. N. (1999). Development and validation of the academic competence evaluation scales. *Journal of Psychoeducational Assessment, 17*, 207-255.

Dishion, T. J., & Tipsord, J. M. (2011). Peer contagion in child and adolescent social and emotional development. *Annual Review of Psychology, 62*(1), 189-214. doi:10.1146/annurev.psych.093008.100412

Doll, B., & Cummings, J. (2008). *Transforming school mental health services*. Bethesda, MD: National Association of School Psychologists.

Domitrovich, C. E., Gest, S. D., Jones, D., Gill, S., & Derousie, R. M. (2010). Implementation quality: Lessons learned in the context of the Head Start REDI trial. *Early Childhood Research Quarterly, 25*(3), 284-298. doi:10.1016/j.ecresq.2010.04.001

Donohew, L., Zimmerman, R., Cupp, P. S., Novak, S., Colon, S., & Abell, R. (2000). Sensation seeking, impulsive decision-making, and risky sex: Implications for risk-taking and design of intervention. *Personality and Individual Differences, 28*, 1079-1091.

Dowdy, E., Ritchey, K., & Kamphaus, R. W. (2010). School-based screening: A population-based approach to inform and monitor children's mental health needs. *School Mental Health*, *2*(4), 166-176. doi:10.1007/s12310-010-9036-3

Duncan, G. J., Dowsett, C. J., Classens, A., Magnuson, K., Huston, A. C., Klebanov, P., et al. (2007). School readiness and late achievement. *Developmental Psychology 43*(6), 1428-1446.

Durlak, J. A., (2009). How to select, calculate, and interpret effect sizes. *Journal of Pediatric Psychology, 34*, 917-928.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta - analysis of school - based universal interventions. *Child Development*, *82*(1), 405-432. doi:10.1111/j.1467-8624.2010.01564.x

Durlak, J. A., & Wells, A. M. (1997). Primary prevention mental health programs for children and adolescents: A meta - analytic review. *American Journal of Community Psychology*, *25*(2), 115-152. doi:10.1023/A:1024654026646

Eisenberg, N., Cumberland, A., & Spinrad, T. L. (1998). Parental socialization of emotion. *Psychological Inquiry*, *9*(4), 241-273. doi:10.1207/s15327965pli0904_1

Eisenberg, N., Fabes, R. A., & Losoya, S. (1997). Emotional responding: Regulation, social correlates, and socialization. In P. Salovey and D. J. Sluyter (Eds.), *Emotional development and emotional intelligence: Educational implications* (pp. 129-163). New York: Basic Books.

Eisenberg, N., Sadovsky, A., Spinrad, T. L., Fabes, R. A., Losoya, S. H., Valiente, C., et al. (2005). The relations of problem behavior status to children's negative emotionality, effortful control, and impulsivity: Concurrent relations and prediction of change. *Developmental Psychology, 41*, 193-211.

Elias, M. J., Parker, S., & Rosenblatt, J. L. (2005). Building educational opportunity. In S. Goldstein & R. B. Brooks (Eds.), *Handbook of resilience in children* (pp. 315-336). New York: Kluwer Academic/Plenum. doi:10.1007/0-306-48572-9_19

Elias, M. J., & Tobias, S. E. (1996). *Social problem solving interventions in the schools*. NY: Guilford.

Elias, M. J., Zins, J.E., Weissberg, R.P., Frey, K.S., Greenberg, M.T., Haynes, N.M., Kessler, R., Schwab-Stone, M.E., & Shriver, T.P. (1997). *Promoting social and emotional learning: Guidelines for educators*. Alexandria, VA: ASCD.

Elliott, S. N., Frey, J. R. & Davies, M. (2015). Systems for assessing and improving students' social skills to achieve academic competence. In J. A. Durlak, C. E. Domitrovich, R. P. Weissberg, T. P. Gullotta (Eds.), *Handbook of social emotional learning: Research and practice* (pp. 301-309). New York, NY: Guilford.

Else-Quest, N. M., Hyde, J. S., Goldsmith, H. H., & Van Hulle, C. A. (2006). Gender differences in temperament: a meta-analysis. *Psychological Bulletin*, *132*(1), 33. doi:10.1037/0033-2909.132.1.33

*Exemplary & promising safe, disciplined, and drug-free schools programs, 2001* (2002). Washington, D.C.: U.S. Dept. of Education, Office of Educational Research and Improvement, Office of Elementary and Secondary Education. Retrieved from http://www.ed.gov/admins/lead/safety/exemplary01/sddsguid.pdf

Fabes, R. A., Eisenberg, N., Karbon, M., Bernzweig, J., Speer, A. L., & Carlo, G. (1994). Socialization of children's vicarious emotional responding and prosocial behavior: Relations with mothers' perceptions of children's emotional reactivity. *Developmental Psychology, 30*, 44-55.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39* (2), 175-191. doi: 10.3758/BF03193146

Flanagan, K. S., Bierman, K. L., & Kam, C. M. (2003). Identifying at-risk children at school entry: The usefulness of multibehavioral problem profiles. *Journal of Clinical Child and Adolescent psychology*, *32*(3), 396-407. doi:10.1207/S15374424JCCP3203_08

Flook, L., Repetti, R. L., & Ullman, J. B. (2005). Classroom social experiences as predictors of academic performance. *Developmental Psychology*, *41*(2), 319. doi:10.1037/0012-1649.41.2.319

Frey, K. S., Nolen, S. B., Edstrom, L. V. S., & Hirschstein, M. K. (2005). Effects of a school-based social–emotional competence program: Linking children's goals, attributions, and behavior. *Journal of Applied Developmental Psychology*, *26*(2), 171-200. doi:10.1016/j.appdev.2004.12.002

Fuchs, L. S., & Deno, S. L. (1991). Paradigmatic distinctions between instructionally relevant measurement models. *Exceptional Children, 57,* 488-501.

Gamm, S., Elliott, J., Halbert, J. W., Price-Baugh, R., Hall, R., Walston, D., Uro, G., & Casserly, M. (2012). *Common core state standards and diverse urban students: Using multi-tiered systems of support*. Washington, DC: Council of Great City Schools.

Garner, P. W., & Waajid, B. (2012). Emotion knowledge and self-regulation as predictors of preschoolers' cognitive ability, classroom behavior, and social competence. *Journal of Psychoeducational Assessment*, *30*(4), 330-343. doi:10.1177/0734282912449441

Good, R. H., & Kaminski, R. A. (2003). *Dynamic indicators of basic early literacy skills*. Longmont, CO: Sopris West.

Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40(11), 1337-1345. doi:10.1097/00004583-200111000-00015

Graham, S., & Juvonen, J. (1998). Self-blame and peer victimization in middle school: An attributional analysis. *Developmental Psychology*, *34*(3), 587. doi:10.1037/0012-1649.34.3.587

Greenberg, M. T., Domitrovich, C., & Bumbarger, B. (2001). The prevention of mental disorders in school-aged children: Current state of the field. *Prevention and Treatment*, *4*(1). doi:10.1037/1522-3736.4.1.41a

Greenberg, M. T., Kusche, C. A., Cook, E. T., & Quamma, J. P. (1995). Promoting emotional competence in school-aged children: The effects of the PATHS Curriculum. *Development and Psychopathology, 7*, 117-136.

Greenberg, M. T., Weissberg, R. P., O'Brien, M. U., Zins, J. E., Fredericks, L., Resnik, H., & Elias, M. J. (2003). Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. *American Psychologist*, *58*(6-7), 466. doi:10.1037/0003-066X.58.6-7.466

Gresham, F. M. (2005). Response to intervention: An alternative means of identifying students as emotionally disturbed. *Education and Treatment of Children*, 328-344.

Gresham, F. M., MacMillan, D. L., Beebe-Frankenberger, M. E., & Bocian, K. M. (2000). Treatment integrity in learning disabilities intervention research: Do we really know how treatments are implemented? *Learning Disabilities Research & Practice, 15*, 198-205.

Grossman, D. C. (1997). Effectiveness of a violence prevention curriculum among children in elementary school. *The Journal of the American Medical Association, 277*(20), 1605. doi:10.1001/jama.1997.03540440039030

Guerra, N. G., & Bradshaw, C. P. (2008). Linking the prevention of problem behaviors and positive youth development: Core competencies for positive youth development and risk prevention. *New Directions for Child and Adolescent Development*, 2(122), 1-17. doi:10.1002/cd.225

Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes Publishing Company.

Hawkins, J. D., Farrington, D. P., & Catalano, R. F. (1998). Reducing violence through the schools, In D. S. Elliot, B. A. Hamburg, & K. R. Williams (Eds.) *Violence in American schools* (pp. 188-216). New York, NY: Cambridge University Press.

Hill, C. J., Bloom, H. S., Black, A. R., & Lipsey, M. W. (2007). Empirical benchmarks for interpreting effect sizes in research. *Child Development Perspectives*, *2*(3), 172-177. doi:10.1111/j.1750-8606.2008.00061.x

Hjemdal, O., Friborg, O., Stiles, T. C., Rosenvinge, J. H., & Martinussen, M. (2006). Resilience predicting psychiatric symptoms: A prospective study of protective factors and their role in adjustment to stressful life events. *Clinical Psychology and Psychotherapy*, *13*(3), 194-201. doi:10.1002/cpp.488

Hosp, J. L., Howell, K. W., & Hosp, M. K. (2003). Characteristics of behavior rating scales implications for practice in assessment and behavioral support. *Journal of Positive Behavior Interventions*, *5*(4), 201-208. doi:10.1177/10983007030050040301

Howse, R. B., Lange, G., Farran, D. C., & Boyles, C. D. (2003). Motivation and self-regulation as predictors of achievement in economically disadvantaged young children. *Journal of Experimental Education, 71*(2), 151-174.

Hoyt, W. T., & Kerns, M. D. (1999). Magnitude and moderators of bias in observer ratings: A meta-analysis. *Psychological Methods, 5*(1), 64-86.

Izard, C., Fine, S., Schultz, D., Mostow, A., Ackerman, B., & Youngstrom, E. (2001). Emotion knowledge as a predictor of social behavior and academic competence in children at risk. *Psychological Science, 12*(1), 18-23. doi:10.1111/1467-9280.00304

Jenkins, J. R., Hudson, R. F., & Johnson, E. S. (2007). Screening for at-risk readers in a response to intervention framework. *School Psychology Review*, *36*(4), 582.

Jimerson, S. R., Burns, M. K., & VanDerHeyden, A. M. (2007). *Handbook of response to intervention: The science and practice of assessment and intervention*. New York: Springer. doi:10.1007/978-0-387-49053-3

Jolliffe, D., & Farrington, D. P. (2004). Empathy and offending: A systematic review and meta-analysis. *Aggression and Violent Behavior, 9*, 441-476.

Jones, D.E., Greenberg, M., & Crowley, M. (2015). Early social-emotional functioning and public health: The relationship between kindergarten social competence and future wellness. *American Journal of Public Health, 105*(11), 2283-2290. doi:10.2105/AJPH.2015.302630

Juvonen, J., Nishina, A., & Graham, S. (2000). Peer harassment, psychological adjustment, and school functioning in early adolescence. *Journal of Educational Psychology*, *92*(2), 349. doi:10.1037/0022-0663.92.2.349

Kamphaus, R. W., & Reynolds, C. R. (2007). *Behavior Assessment System for Children—Second edition (BASC–2): Behavioral and Emotional Screening System (BESS).* Bloomington, MN: Pearson.

Katsurada, E., & Sugawara, A. I. (1998). The relationship between hostile attributional bias and aggressive behavior in preschoolers. *Early Childhood Research Quarterly, 13*(4), 623-636.

Kaukiainen, A., Bjorkqvist, K., Lagerspetz, K, Osterman, K., Salmivalli, C., Rothberg, S., et al. (1999). The relationships between social intelligence, empathy, and three types of aggression. *Aggressive Behavior, 25*, 81-89.

Kroesbergen, E. H., Van Luit, J. H., Van Lieshout, E. M., Van Loosbroek, E., & Van de Rijit, B. M. (2009). Individual differences in early numeracy: The role of executive functions in subittzing, *Journal of Psychoeducational Assessment, 27*, 226-236

Lane, K. L., & Menzies, H. M. (2003). A school-wide intervention with primary and secondary levels of support for elementary students: Outcomes and considerations. *Education and Treatment of Children*, 431-451.

LeBuffe, P. A., Naglieri, J. A., & Shapiro, V. B. (2011). *The Devereux Student Strengths Assessment–Second Step Edition (DESSA-SSE).* Lewisville, NC: Kaplan.

LeBuffe, P. A., Ross, K. M., Fleming, J. L., & Naglieri, J. A. (2013). The Devereux Suite: Assessing and promoting resilience in children ages 1 month to 14 years. In *Resilience in children, adolescents, and adults* (pp. 45-59). Springer: New York. doi:10.1007/978-1-4614-4939-3_4

LeBuffe, P. A., Shapiro, V. B., & Naglieri, J. A. (2009). *Devereux Student Strengths Assessment.* Lewisville, NC: Kaplan.

Levitt, J. M., Saka, N., Romanelli, L. H., & Hoagwood, K. (2007). Early identification of mental health problems in schools: The status of instrumentation. *Journal of School Psychology*, *45*(2), 163-191. doi:10.1016/j.jsp.2006.11.005

Low, S., Cook, C. R., Smolkowski, K., & Buntain-Ricklefs, J. (2015). Promoting social–emotional competence: An evaluation of the elementary version of Second Step®. *Journal of School Psychology*, *53*(6), 463-477. doi:10.1016/j.jsp.2015.09.002

Malecki, C. K., & Elliot, S. N. (2002). Children's social behaviors as predictors of academic achievement: A longitudinal analysis. *School Psychology Quarterly*, *17*(1), 1. doi:10.1521/scpq.17.1.1.19902

Masten, A. S. (1994). Resilience in individual development: Successful adaptation despite risk and adversity. In M. C. Wang, E. W. Gordon (Eds.). *Educational resilience in inner-city America: Challenges and prospects* (3-25). Hillsdale, NJ: Erlbaum

Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments: Lessons from research on successful children. *American Psychologist*, *53*(2), 205. doi:10.1037/0003-066X.53.2.205

Mayer, J. D., & Salovey, P. (1997). What is emotional intelligence? In P. Salovey & D. J. Sluyter (Eds.), *Emotional development and emotional intelligence: Educational Implications* (pp. 3-31). New York: Basic Books.

McIntosh, K., Chard, D. J., Boland, J. B., & Horner, R. H. (2006). Demonstration of combined efforts in school-wide academic and behavioral systems and incidence of reading and

behavior challenges in early elementary grades. *Journal of Positive Behavior Interventions*, *8*(3), 146-154. doi:10.1177/10983007060080030301

McClelland, M., Acock, A. C., & Morrison, F. J. (2006). The impact of kindergarten learning-related social skills on academic achievement at the end of elementary school. *Early Childhood Research Quarterly, 21*, 471-490.

Merrell, K. W. (1993). *School social behavior scales: Test manual*. Brandon, VT: Clinical Psychology Pub.

Merrell, K. W., Juskelis, M. P., Tran, O. K., & Buchanan, R. (2008). Social and emotional learning in the classroom: Evaluation of strong kids and strong teens on students' social-emotional knowledge and symptoms. *Journal of Applied School Psychology*, *24*(2), 209-224. doi:10.1080/15377900802089981

Merrell, K. W., Cohn, B. P., & Tom, K. M. (2011). Development and validation of a teacher report measure for assessing social-emotional strengths of children and adolescents. *School Psychology Review*, *40*(2), 226.

Merrell, K. W., Ervin, R. A., & Peacock, G. G. (2012). *School psychology for the 21st century: Foundations and practices*. New York: Guilford Press.

Merrell, K. W., & Gueldner, B. A. (2010). *Social and emotional learning in the classroom: Promoting mental health and academic success*. New York: Guilford Press.

Miller, S., Malone, P. S., Dodge, K. A., & Conduct Problems Prevention Research Group. (2010). Developmental trajectories of boys' and girls' delinquency: Sex differences and links to later adolescent outcomes. *Journal of Abnormal Child Psychology*, *38*(7), 1021-1032. doi:10.1007/s10802-010-9430-1

Muenning, P., Schweinhart, L., Montie, J., & Neidell, M. (2008). Effects of a prekindergarten educational intervention on adult health: 37-year follow-up results of a randomized controlled trial. *American Journal of Public Health, 99*(8), 1431-1437.

Naglieri, J. A., LeBuffe, P., & Shapiro, V. B. (2011). Universal screening for social–emotional competencies: A study of the reliability and validity of the DESSA - mini. *Psychology in the Schools*, *48*(7), 660-671. doi:10.1002/pits.20586

Nastasi, B. K., Moore, R. B., & Varjas, K. M. (2004). *School-based mental health services: Creating comprehensive and culturally specific programs*. Washington, DC: American Psychological Association. doi:10.1037/10724-000

National Registry of Evidence-based Programs and Practices (2009). Retrieved from http://nrepp.samhsa.gov/

Nese, R. N., Doerner, E., Romer, N., Kaye, N. C., Merrell, K. W., & Tom, K. M. (2012). Social emotional assets and resilience scales: Development of a strength-based short-form behavior rating scale system. *Journal for Educational Research Online*, *4*(1), 124.

Noble, K. G., Norman, M. F., & Farah, M. J. (2005). Neurocognitive correlates of socioeconomic status in kindergarten children. Developmental Science, 8(1), 74-87. doi: 10.111/j.1467-7687.2005.00394.x

Northwest Evaluation Association. (2009). *Technical manual for measures of academic progress and measures of academic progress for primary grades*. Lake Oswego, OR: Author.

Model Programs Guide, Office of Juvenile Justice and Delinquency Prevention (n.d.). Retrieved from https://www.ncjrs.gov/pdffiles1/ojjdp/187079.pdf

Osher, D., Sprague, J., Weissberg, R. P., Axelrod, J., Keenan, S., Kendziora, K., & Zins, J. E. (2008). A comprehensive approach to promoting social, emotional, and academic growth in contemporary schools. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology*, (pp. 1263-1278). Bethesda, MD: National Association of School Psychologists.

Payton, J., Weissberg, R. P., Durlak, J. A., Dymnicki, A. B., Taylor, R. D., Schellinger, K. B., & Pachan, M. (2008). *The positive impact of social and emotional learning for kindergarten to eighth-grade students: Findings from three scientific reviews.* Retrieved from http://www.casel.org/library/2013/11/1/the-positive-impact-of-social-and-emotional-learning-for-kindergarten-to-eighth-grade-students

Pianta, R. C., Hamre, B. K., & Allen, J. P. (2012). Teacher-student relationships and engagement: Conceptualizing, measuring, and improving the capacity of classroom interactions. In S. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 365-386). New York: Springer. doi:10.1007/978-1-4614-2018-7_17

Ponitz, C. C., McClelland, M. M., Matthews, J. S., & Morrison, F. J. (2009). A structured observation of behavioral self-regulation and its contribution kindergarten outcomes. *Developmental Psychology, 45,* 605-619.

Prince-Embury, S. (2007). *Resiliency scales for adolescents: A profile of personal strengths*. Texas: Harcourt Assessment.

Public Schools Review, LLC, n.d. *Public School Review*. http://www.publicschoolreview.com/

Raudenbush, S. W., & Bryk A. S., (2002). *Hierarchical linear models: Applications and data analysis methods.* Thousand Oaks, CA: Sage Publications, Inc.

Raver, C. C., & Knitzer, J. (2002). *Ready to enter: What research tells policymakers about strategies to promote social and emotional school readiness among three-and four-year-olds*. Retrieved from http://academiccommons.columbia.edu/catalog/ac:127551

Rennie, D., Bull, R., & Diamond, A. (2004). Youth violence perpetration: What protects? What predicts? Findings from the national longitudinal study of adolescent health. *Journal of Adolescent Health, 35,* 424e1-e10.

Rimm-Kaufman, S. E., & Hulleman, C. S. (2015). Social and emotional learning in elementary school settings: Identifying mechanisms that matter. In J. A. Durlak (Ed.), *The handbook of social and emotional learning: Research and practice*, (pp. 151-166). New York: Guilford Press.

Rimm-Kaufman, S. E., Lasen, R. A. A., Baroody, A. E., Curby, T. W., Ko, M., Thomas, J. B., Merritt, E. G., Abry, T., & DeCoster, J. (2014). Efficacy of the Responsive Classroom Approach: Results from a 3-year longitudinal randomized controlled trial. *American Educational Research Journal, 20*(10), 1-37.

Rimm-Kaufman, S. E., Pianta, R. C., & Cox, M. J. (2000). Teachers' judgments of problems in the transition to kindergarten. *Early Childhood Research Quarterly*, *15*(2), 147-166. doi:10.1016/S0885-2006(00)00049-1

Roeser, R. W., Eccles, J. S., & Freedman-Doan, C. (1999). Academic functioning and mental health in adolescence: Patterns, progressions, and routes from childhood. *Journal of Adolescent Research, 14*(2), 135-174. doi: 10.1177/0743558499142002

Romer, D., & Mcintosh, M. (2005). The roles and perspectives of school mental health professionals in promoting adolescent mental health. *What we know and what we don't know. A research agenda for improving the mental health of our youth treating and preventing adolescent mental health disorders,* 597-615. doi:10.1093/9780195173642.003.0032

Rones, M., & Hoagwood, K. (2000). School-based mental health services: A research review. *Clinical Child and Family Psychology Review*, *3*(4), 223-241. doi:10.1023/A:1026425104386

Salvia, J., Bolt, S. E., & Ysseldyke, J. E. (2010). *Assessment in special and inclusive education*. Belmont, CA: Wadsworth/Cencage Learning.

Saarni, C. (1997). Emotional competence and self-regulation in childhood. In P. Salovey and D. J. Sluyter (Eds.), *Emotional development and emotional intelligence: Educational implications* (pp. 35-66). New York: Basic Books.

Seifer, R., LaGrasse, L. L., Lester, B., Bauer, C. R., Shankaran, S., Bada, H. S., et al. (2004). Attachment status in children prenatally exposed to cocaine and other substances. *Child Development, 75*, 850-868.

Severson, H. H., Walker, H. M., Hope-Doolittle, J., Kratochwill, T. R., & Gresham, F. M. (2007). Proactive, early screening to detect behaviorally at-risk students: Issues, approaches, emerging innovations, and professional practices. *Journal of School Psychology*, *45*(2), 193-223. doi:10.1016/j.jsp.2006.11.003

Shure, M. B., & Spivack, G. (1980). Interpersonal problem solving as a mediator of behavioral adjustment in preschool and kindergarten children. *Journal of Applied Developmental Psychology, 1*, 29-44.

Shure, M. B., & Spivack, G. (1982). Interpersonal problem-solving in young children: A cognitive approach to prevention. *American Journal of Community Psychology, 10*, 341-356.

Simons, J. S., Carey, K. B., & Gaher, R. M. (2004). Lability and impulsivity synergistically increase risk for alcohol-related problems. *The American Journal of Drug and Alcohol Abuse, 30*, 685-694.

Sugai, G., & Horner, R. H. (2009). Responsiveness-to-intervention and school-wide positive behavior supports: Integration of multi-tiered system approaches. *Exceptionality*, *17*(4), 223-237. doi:10.1080/09362830903235375

Suldo, S. M., & Shaffer, E. J. (2008). Looking beyond psychopathology: The dual-factor model of mental health in youth. *School Psychology Review*, *37*(1), 52.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics, 6th Edition*. Boston: Pearson Education.

Taub, J. (2001). Evaluation of the Second Step Violence Prevention Program at a rural elementary school. *School Psychology Review, 31*, 186-200.

Tilly, W. D. (2008). The evolution of school psychology to science-based practice: Problem solving and the three-tiered model. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology*, (pp. 17-36). Bethesda, MD: National Association of School Psychologists.

Tilly, W. D., Reschly, D. J., & Grimes, J. (1999). Disability determination in problem solving systems: Conceptual foundations and critical components. In D. J. Reschly, W. D. Tilly, & J. Grimes (Eds), *Special education in transition: Functional assessment and noncategorical programming*, (pp. 221-251). Longmont, CO: Sopris West.

Tolan, P. H., & Guerra, N. G. (1994). Prevention of delinquency: Current status and issues. *Applied and Preventive Psychology, 3*, 251-273.

Underwood, M. K., Coie, J. D., & Herbsman, C. R. (1992). Display rules for anger and aggression in school-aged children. *Child Development, 63*, 366-380.

Valiente, C., Lemery-Chalfant, K., Swanson, J., & Reiser, M. (2008). Prediction of children's academic competence from their effortful control, relationships, and classroom participation. *Journal of Educational Psychology*, *100*(1), 67. doi:10.1037/0022-0663.100.1.67

van Buuren, S. (2012). *Flexible imputation of missing data.* Boca Raton, FL: CRC Press.

VanDerHeyden, A. M., Witt, J. C., & Gilbertson, D. (2007). A multi-year evaluation of the effects of a response to intervention (RTI) model on identification of children for special education. *Journal of School Psychology*,*45*(2), 225-256. doi:10.1016/j.jsp.2006.11.004

Vitaro, F., Brendgen, M., Larose, S., & Tremblay, R. E. (2005). Kindergarten disruptive behaviors, protective factors, and educational achievement by early adulthood. *Journal of Educational Psychology, 97*(4), 617-629.

Vitaro, F., Ferland, F., Jacques, C., & Ladouceur, R. (1998). Gambling, substance use, and impulsivity during adolescence. *Psychology of Addictive Behaviors, 12*(3), 185-194.

Wang, M. C., Haertel, G. D., & Walberg, H. J. (1997). Learning influences. In H. J. Walberg & G. D. Haertel (Eds.), *Psychology and educational practice* (pp. 199-211). Berkeley, CA: McCutchan.

Weist, M. D., Rubin, M., Moore, E., Adelsheim, S., & Wrobel, G. (2007). Mental health screening in schools. *Journal of School Health*, *77*(2), 53-58. doi:10.1111/j.1746-1561.2007.00167.x

Weisz, J. R., Sandler, I. N., Durlak, J. A., & Anton, B. S. (2005). Promoting and protecting youth mental health through evidence-based prevention and treatment. *American Psychologist*, *60*(6), 628. doi:10.1037/0003-066X.60.6.628

Welsh, M., Parke, R. D., Widaman, K., & O'Neil, R. (2001). Linkages between children's social and academic competence: A longitudinal analysis. *Journal of School Psychology*, *39*(6), 463-482. doi:10.1016/S0022-4405(01)00084-X

Wentzel, K. R. (1991). Relations between social competence and academic achievement in early adolescence. *Child Development, 62*, 1066-1078.

Wentzel, K. R. (1993). Does being good make the grade? Social behavior and academic competence in middle school. *Journal of Educational Psychology*, *85*(2), 357. doi:10.1037/0022-0663.85.2.357

Ysseldyke, J., et al. (2006). *School psychology: A blueprint for training and practice III*. Bethesda, MD: National Association of School Psychologists.

Zins, J.E., Bloodworth, M.R., Weissberg, R.P., & Walberg, H.J. (2004). The scientific base linking social and emotional learning to school success. In J.E. Zins, R.P. Weissberg,

M.C. Wang & H.J. Walber (Eds.), *Building academic success on social and emotional learning: What does the research say* (pp. 3-22). New York, NY: Teachers College Press.

Zins, J.E., & Elias, M.J. (2006). Social and emotional learning. In G.G. Bear & K.M. Minke (Eds.) *Children's needs III: Development, prevention, and intervention* (pp. 1-13). Bethesda, MD: National Association of School Psychologists.

Zins, J. E., & Elias, M. J. (2007). Social and emotional learning: Promoting the development of all students. *Journal of Educational and Psychological Consultation*, *17*(2-3), 233-255. doi:10.1080/10474410701413152

Zigler, E. F., & Bishop-Josef, S. J. (2006). The cognitive child versus the whole child: Lessons from 40 years of Head Start. In D. G. Singer, R. M. Golinkoff, & K. Hirsh-Pasek (Eds.), *Play= learning: How play motivates and enhances children's cognitive and social-emotional growth*, (pp. 15-35). doi:10.1093/acprof:oso/9780195304381.003.0002