ASSESSING THE IMPACT OF PROGRAMMING TO STRENGTHEN SOCIAL EMOTIONAL SKILLS IN YOUNG SCHOOL CHILDREN: ASSOCIATIONS WITH ACADEMIC AND BEHAVIORAL OUTCOMES

By

Caitlin J. Simmons

A dissertation submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in
Health Psychology

Charlotte

2021

Approved by:

_____
Dr. James R. Cook

_____
Dr. Ryan P. Kilmer

_____
Dr. Kristie Opiola

_____
Dr. Lisa Rasmussen

ABSTRACT

CAITLIN J. SIMMONS. Assessing The Impact of Programming to Strengthen Social Emotional Skills in Young School Children: Associations with Academic and Behavioral Outcomes. (Under the direction of DR. JAMES R. COOK)

Considerable research documents the importance of social emotional development for children's short- and long-term outcomes, including academic outcomes and long-term health and wellbeing. Studies have demonstrated that the development of social emotional skills at a young age is essential for school readiness as well as success later in life; however, many students do not possess the social emotional skills they need to be successful when they enter school. Pre-kindergarten programs represent a key avenue through which young children can receive support in developing social emotional skills. While a myriad of studies demonstrate the positive academic and behavioral effects of pre-kindergarten programs, there have been mixed results regarding how long these effects last. The present study addresses this gap in the literature by examining the relationship between students' social emotional skills in pre-kindergarten and their academic and behavioral outcomes in each year from kindergarten through fifth grade in a large public school district. Additionally, the present study investigates whether social emotional interventions in elementary school can strengthen the effects of pre-kindergarten programs by examining two social emotional programs currently being implemented in elementary schools in the school district, the Yale RULER and Caring School Community. Results of this study support the idea that social emotional skills in pre-k are related to student outcomes well into elementary school. Additionally, the study results show preliminary support for associations between the use of the Caring School Community program and better academic and behavioral outcomes for students; however, this program tended to be implemented in higher SES schools

in the district, raising questions about the equity of implementation. Implications for school-based social emotional programming in pre-kindergarten and elementary schools are discussed.

ACKNOWLEDGEMENTS

I would like to acknowledge my advisors, Dr. James R. Cook and Dr. Ryan P. Kilmer, for their support and feedback throughout my dissertation process and, more broadly, throughout my entire graduate school career at UNC Charlotte. I have learned valuable skills and gained a great deal of confidence in my abilities due to their guidance. I would also like to acknowledge my other committee members, Dr. Kristie Opiola and Dr. Lisa Rasmussen, for helping to make my dissertation a positive experience rather than a terrifying one. This project was made possible by the support of my friends and colleagues who sat on video calls with me for hours to keep me company while I worked during a pandemic. I would especially like to thank Trey Dellucci who wrote with me, gave me honest feedback, prepared me for my defense, and celebrated with me when it was finished. Lastly, I would like to thank my partner, Joseph Elizondo, for being the best partner a graduate student could ask for and helping me reach this finish line.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1: INTRODUCTION

In recent years, many communities and countries around the world have made the expansion of early childhood education a priority to promote early child development, particularly of disadvantaged children (Blanden, 2016). In the Charlotte, NC, community specifically, early childhood education has been identified as a key area for growth to address inequality in economic mobility in the community, focusing on the expansion of publicly-funded pre-kindergarten programs (The Charlotte-Mecklenburg Opportunity Task Force, 2017). One way through which early childhood education programs promote child development is through interventions that develop students' social emotional skills, which are essential for school readiness and later success (Yates, 2008). The present study examines the relationship between social emotional skills and academic and behavioral outcomes with a specific focus on students' social emotional skills in pre-kindergarten and their academic and behavioral outcomes in elementary school. Additionally, this study examines whether social emotional interventions in elementary school can increase the longevity and/or the strength of the effects of pre-kindergarten programs by examining two social emotional programs currently being implemented in kindergarten through eighth grade in a large public school district.

1.1 Relevant Theory and Research

Social emotional development is the capacity to form secure relationships with peers and adults; experience, regulate, and express emotions in socially and culturally appropriate ways; and learn by exploring the environment (Center on the Social Emotional Foundations for Early Learning, 2008). Considerable research documents the importance of social emotional development for both short- and long-term outcomes.

For instance, a study that examined the impact of a multi-year universal social emotional learning (SEL) program for first through third graders found that students who participated in the program had reduced aggression, increased prosocial behavior, and improved academic engagement such as self-control and staying on-task (Bierman et al., 2010). Relatedly, a meta-analysis of universal SEL programs in kindergarten through high school found that program participants had significantly higher social emotional skills (e.g., emotion recognition, decision-making skills), better attitudes about self and others, improved behavior (i.e., increased prosocial behaviors and reduced conduct and internalizing problems), and an 11-percentile gain in academic achievement compared to controls (Durlak et al., 2011).

Programs that support social emotional development have demonstrated positive outcomes in the long-term. A meta-analysis of follow-up effects of school-based universal SEL interventions found that students who received SEL interventions had significantly better social emotional skills, attitudes, and scores on measures of wellbeing (i.e., positive social behavior, emotional distress, drug use) at follow-up collected six months to eighteen years postintervention (Taylor et al., 2017). Social emotional skills impacted critical aspects of students' development up to eighteen years after the intervention (e.g., graduation, safe sex behaviors, number of arrests), and effects were similar across sociodemographic characteristics (i.e., race, socioeconomic status, location). These results are consistent with other studies which have found that social emotional skills in childhood are associated with health and wellbeing later in life, including a higher likelihood of receiving post-secondary education, higher income, and lower rates of criminal activity in adulthood (Barnett, 1993; Campbell et al., 2002; Hawkins et al., 2008; Duncan & Magnuson, 2011; Jones et al., 2015).

These results demonstrate that the development of social emotional skills at a young age is essential for school readiness as well as success later in life; however, many students do not possess the social emotional skills they need to be successful when they enter school (Yates et al., 2008). In a national sample of sixth through twelfth graders, only 29%-45% of students said they possessed social skills such as empathy, decision making, and conflict resolution (Benson, 2006), highlighting the need for interventions that support social emotional skills for students beginning at a young age.

One way young children can receive support developing social emotional skills is in pre-kindergarten (pre-k; also referred to as "preschool") programs. Pre-k programs have been associated with the development of important social and emotional skills, including attentiveness, social skills, initiative, emotion regulation, persistence, emotion recognition, and improvements in executive functioning (Xiang & Schweinhart, 2002; Li-Grining et al., 2010; Gormley Jr. et al., 2011; Weiland & Yoshikawa, 2013). Additionally, studies have shown that students who develop better social emotional skills in pre-k also perform better academically, and these results are unrelated to the child's general intelligence in pre-k (Blair & Razza, 2007; von Suchodoletz et al., 2009). Social emotional skills in pre-k have been associated with better early math, literacy, and emergent vocabulary abilities and overall greater school readiness in kindergarten (Blair & Razza, 2007; Gawrilow et al., 2014; McClelland et al., 2007; Ponitz et al., 2009). Further, this early development of social emotional skills may be critical for longer-term academic achievement, as illustrated by Li-Grining and colleagues (2010). They found that differences in students' social emotional skills in kindergarten predicted fifth-grade differences in academic achievement. Also of note is that some researchers have found social emotional

skills in pre-k to be more predictive of long-term outcomes in adulthood (e.g., employment) than cognitive ability (Heckman et al., 2013).

While there is a myriad of studies that demonstrate the positive academic and behavioral effects of pre-k programs, particularly those that foster students' social emotional development, there have been mixed results regarding how long these effects last. Some studies have found evidence that academic gains in pre-k persist into fifth grade (Claessens et al., 2009; Li-Grining et al., 2010), while others have found that the effects of attending pre-k fade by the end of first grade (Magnuson et al., 2007; von Suchodoletz et al., 2009). Relatedly, a review of the effects of pre-k programs by Yoshikawa and colleagues (2013) found that, while there were long term effects on a range of outcomes (e.g., graduation rates, teenage pregnancy, criminal activity), the positive effects on achievement tests diminished by elementary school.

One possible way to address concerns about the duration of positive effects of social emotional programming in pre-k is through school-based social emotional interventions in elementary school. Given the importance of social emotional development in academics and beyond, there is a large number of different programs for developing social emotional skills in pre-k and elementary school. The Collaborative for Academic, Social, and Emotional Learning (CASEL; casel.org) is a nonprofit organization that conducts research, engages in policy advocacy, and works directly with school districts. They also have an online resource that compiles research related to social emotional programming and identifies aspects of the most effective programs for teaching social emotional skills at different levels of education. The organization's goal is to support social emotional programming nationwide, and their guide to effective social and emotional learning programs in pre-k and elementary school (CASEL, 2013)

is a useful tool for educators. The program guide provides an overview of select SEL programs and specifies the strategies employed by these programs to teach social emotional skills effectively.

The classroom strategies identified by CASEL as effective for teaching social emotional skills are as follows: explicit skills instruction, which involves lesson plans and classroom activities that focus specifically on building social and emotional skills; integration with academic curriculum areas, which involves teaching social emotional skills in conjunction with other academic subjects; and teacher instructional practices, which involves classroom management strategies that promote a positive classroom environment and engage students in supporting social emotional programming. CASEL also documents the degree to which programs engage contexts outside the classroom to promote and reinforce SEL (i.e., classroom, school, family, and community). The SEL programs identified in the CASEL guide use different combinations of these classroom strategies and contexts for teaching social emotional skills (CASEL, 2013). Additionally, the best practices provided by CASEL are the same at the pre-k level and elementary school level.

The present study examines outcomes associated with two social emotional programs implemented in elementary schools in a large southeastern public school district. These interventions, the Yale RULER and Caring School Community, are described below, including studies that document their effectiveness and the degree to which they include the elements identified by CASEL as effective for social emotional instruction in elementary school.

1.1.1 RULER

The RULER curriculum was developed by researchers at Yale University and is an intervention to improve social emotional skills for students in kindergarten through eighth grade (Maurer & Brackett, 2004). RULER is grounded in emotional intelligence theory and built around five key skills for developing emotional literacy (Rivers & Brackett, 2010) by recognizing, understanding, labeling, expressing, and regulating emotion. The RULER approach includes training for school staff (e.g., teachers), parent and family engagement, and a curriculum for classroom instruction called the Feeling Words Curriculum (https://www.rulerapproach.org/).

Adoption and implementation of the RULER program in a school district begins with training of school staff. A school team attends the RULER Training Institute which provides training on the principles and tools of emotional intelligence and the implementation of the RULER curriculum. This school team then leads the training of other faculty and staff at their school using RULER's online resources. The school district spends at least one year familiarizing their faculty and staff with the RULER curriculum and tools through RULER's online implementation support platform, virtual group coaching sessions, and monthly newsletters. After this training period, schools can move forward with the implementation of RULER with students in their classrooms.

The RULER Feeling Words Curriculum is a structured curriculum integrated into regular classroom instruction, a method that effectively teaches children to regulate their emotions to prevent behavior problems rather than addressing behavioral concerns when they arise (Hoffmann et al., 2020). Each unit centers around a "feeling word" related to emotions that are

developmentally appropriate for the student's age and grade level (e.g., "happy" for younger students, "elated" for older students; Rivers & Brackett, 2010), and there are twelve units for each grade level. Each unit has five steps to help students understand, use, and think critically about the "feeling word": 1) students learn the meaning of the new feeling word and connect it to a personal experience; 2) students link the word to curriculum content, such as a book reading in class, a current event, or other lessons in the classroom; 3) parents and caregivers are encouraged to participate, allowing students to go home and teach their families about the feeling word, and discuss the connections they have made in steps 1 and 2; 4) students use visual representations to communicate their understanding of the feeling word – drawings, performances, sounds, or other creative ways; and 5) in the final step, students brainstorm in groups and critically analyze ways to regulate emotions they experience or that are experienced by characters they learned about in class (Rivers & Brackett, 2010).

RULER curriculum activities help teachers differentiate instruction for particular classroom needs (Brackett et al., 2012). In addition to the Feeling Words Curriculum, RULER includes professional development for school staff and teachers and workshops for parents and families (Brackett et al., 2009). The RULER curriculum employs best practices for teaching social emotional skills developed by CASEL, including integrating social emotional instruction into other subject areas, providing ways to differentiate instruction for different learning styles and classroom needs, offering support and training opportunities for teachers, and drawing on empirical evidence (Brackett et al., 2012; CASEL, 2013).

Studies examining the impact of RULER on student outcomes have had promising results. In one study, students in fifth and sixth grade had better reading, writing, and science

grades after seven months of using RULER compared to students in classrooms not using RULER (Brackett et al., 2012). Students in RULER classrooms in this study also had fewer attention and learning problems compared to non-RULER classrooms. A study of over one thousand students in the United Kingdom found that RULER was associated with increases in students' emotional intelligence (Brackett et al., 2009). One study examined how training, dosage, and implementation quality of RULER impacted student outcomes and found that students had better social problem-solving skills and emotional literacy when their teachers attended more training, taught more lessons, and had moderate or high-quality program implementation (Reyes et al., 2012). While most studies of RULER's impact on student outcomes have not examined differences due to race, gender, or socioeconomic status of students (e.g., Brackett et al., 2012), one study compared the impact of RULER in three early childhood centers serving low-income families (Bailey et al., 2019). In this study, children in RULER classrooms had a greater ability to label emotions and better emotion recognition than children in comparison classrooms.

Researchers have also examined the impact of RULER on classroom climate. A two-year, randomized control trial that examined the impact of RULER on the quality of classroom interactions found that, at the end of the second year, RULER classrooms showed higher levels of emotional and instructional support and better classroom organization than comparison classrooms (Hagelskamp et al., 2013). Another study examined whether fifth and sixth grade classrooms that used the RULER curriculum had better social and emotional climates, including positive vs. negative climate, teacher sensitivity, and awareness and responsiveness to student needs (Rivers et al., 2013). RULER classrooms contained higher levels of warmth and connectedness between students and teachers as well as greater autonomy and leadership among

students, and teachers more often incorporated students' individual interests and motivations in their teaching rather than using a teacher-driven approach. Teachers also reported that their interactions with students were more emotionally focused, creating more opportunities for cooperative learning.

The identified studies examined the impact of the RULER curriculum over short periods (e.g., a single school year or semester); however, this curriculum is a multi-year program designed to be implemented in kindergarten through eighth grade and may present more robust results in a longitudinal study (Brackett et al., 2012). According to the Yale Center for Emotional Intelligence, RULER is currently undergoing a five-year evaluation funded by the Institute for Education Sciences (IES), which will be complete in 2023. Additionally, researchers are currently conducting a randomized controlled trial of RULER in elementary schools, a study also funded by the IES. The results of these studies are not yet available.

1.1.2 Caring School Community

The Center for the Collaborative Classrooms' Caring School Community (CSC) program (formerly known as the Child Development Program) is an SEL program for kindergarten through eighth grade which focuses on taking a whole-school approach to develop students' social and emotional skills. The program centers on seven principles, including a focus on the whole school as a community, building relationships among school community members, and taking a transformative stance on discipline (for more information about CSC principles, see https://www.collaborativeclassroom.org/programs/caring-school-community/). The CSC program uses four core educational practices: class meetings (30-35 per grade), which are specific lessons and activities implemented throughout the year; cross-age buddies, where a

younger student is paired with an older student and participates in forty activities throughout the year which promote bonding and academic exploration; home side activities, which occur once or twice a month and involve activities completed at home with caregivers, followed by a reflection in class; and school-wide community-building activities, which promote building relationships with other school community members through activities implemented throughout the school year (CASEL, n.d.).

The CSC curriculum employs some of CASEL's best practices for teaching social emotional skills, including strategies for integrating SEL into other academic subjects and using teacher instructional practices to promote a positive classroom environment. The CSC is also one of only two elementary school SEL programs, which CASEL has identified as providing extensive reinforcement of SEL in four contexts: classroom-wide, school-wide, family, and community (CASEL, 2013). In contrast to the RULER program, CSC does not implement explicit SEL skills instruction as one of their classroom approaches to teaching SEL.

Studies of the CSC program have found positive impacts on various student outcomes. According to the 2013 CASEL guide for effective SEL programs, the CSC program has improved academic performance, increased positive social behavior, reduced conduct problems, and reduced emotional distress among students (CASEL, 2013). The program has also undergone two federally funded evaluations. The first occurred in St. Louis, MO, in 2002-05, where forty schools were randomly assigned to implement the CSC program or serve as a control. The CSC schools showed significantly higher math and reading scores on state achievement tests than control schools.

Additionally, schools that implemented the program over a greater number of years (i.e., the entire evaluation period) showed significantly higher state achievement test scores than schools that implemented CSC for fewer years (Marshall & Caldwell, 2007; Center for the Collaborative Classroom, 2018). The second evaluation conducted by the San Francisco Unified School District's research department from 2003-06 randomized twelve elementary schools into two groups – six schools received the CSC program, and the other six schools served as a control group. At the end of two years, students who received the CSC program showed significantly greater gains in reading and math than students in the control group (Roberson, 2006; Center for the Collaborative Classroom, 2018).

Studies of the CSC program have also found positive impacts on non-academic outcomes for students. For example, one study examined the CSC program's impact on elementary school students' social development. The program was implemented at three schools in a suburban community for seven years (kindergarten through sixth grade), and three control schools in the same community. Students who participated in the program self-rated significantly higher on peer acceptance and significantly lower on loneliness and social anxiety than students in the control group (Battistich, 2003). In a follow up to that study, researchers examined middle school outcomes for those students who received the CSC program in elementary. Middle school students who participated in the CSC program in elementary school were more engaged in school, were more prosocial, and had fewer conduct problems than their middle school peers who did not participate in the elementary CSC program (Battistich et al., 2003). Another study found that, in schools that made meaningful progress towards implementing the CSC program, there were significant reductions in students' drug and alcohol use and reductions in other

conduct problems (e.g., running away from home, being involved in fights) compared to students in comparison schools (Battistich et al., 2000).

1.2 Specific Aims

The present study has several aims to examine the relationship between social emotional skills and academic and behavioral outcomes. Specifically, this study examines the relationship between ratings of students' social emotional skills in pre-k and their academic and behavioral outcomes in each grade from kindergarten through fifth grade. Examining these outcomes over time provides valuable information regarding the duration of pre-k's effects on these outcomes and more specific information about when the effects begin to fade (i.e., in which grade do we no longer see effects?). Additionally, the present study examines whether the duration of these effects differs based on the student's social emotional skills in pre-k, providing insight into whether improving a student's social emotional development can increase the duration of academic and behavioral effects (i.e., do effects last longer for students with higher social emotional scores in pre-k?). The present study also examines the relationship between students' social emotional skills in pre-k and their social emotional skills in sixth grade, providing further information regarding the duration of gains made in pre-k. This provides valuable information regarding long-term outcomes associated with pre-k and can addresses a gap in the literature related to the duration of the positive effects of pre-k programs.

This study also examines whether providing additional social emotional programming in elementary school can address concerns about the longevity of pre-k program outcomes and strengthen social emotional development overall. The present study examines outcomes associated with two social emotional programs currently being implemented in a large public

school district: the Yale RULER and Caring School Community. This allows for the examination of whether student outcomes associated with these programs differ for students who attended a pre-k program vs. those who did not and whether these types of programs can prolong positive effects for those students who attended pre-k. This review has not identified any studies which examine these two interventions simultaneously. Additionally, some schools in this school district are implementing a combination of these programs, which allows for the examination of outcomes associated with the implementation of multiple programs, an area of research that is not addressed in the literature. Lastly, this study examines fifth grade academic and behavioral outcomes for students who attended pre-k and did not receive additional social emotional programming in elementary to determine whether the additional interventions contribute meaningfully to these longer-term outcomes.

1.3 The Context of the Present Study

The present study uses archival data collected during an evaluation of a publicly funded pre-k program in a large school district during the 2013-14 academic year. Specifically, this study uses teacher ratings of pre-k students' social emotional development collected at the beginning and end of the academic year. This study also uses archival data related to students' academic and behavioral outcomes collected from the public school district for the academic years from 2014-15 to 2019-20, and data related to students' social emotional skills from the 2020-21 academic year.

Implementation of the two social emotional programs of interest, RULER and CSC, began across elementary schools in this public school district in the Fall of 2018. During the 2019-20 academic year, forty-seven schools implemented the RULER program, and sixty

schools implemented CSC. The school district intended to implement RULER with teachers during the first two years and plans to expand the program to be implemented with students moving forward. As a result, the present study examines student outcomes associated with only one part of the RULER program, the intervention with teachers.

Implementation of the social emotional programs, as well as other school activities and data collection (e.g., standardized exams), were interrupted and/or canceled beginning in March of 2020 due to school closures related to the COVID-19 pandemic. Considerations for data analysis and interpretation are discussed in the Limitations section.

1.4 Research Questions

The present study addresses several research questions about the relationship between social emotional skills and academic and behavioral outcomes. The specific research questions are as follows:

> Research Question 1: How are students' social emotional scores in pre-k related to academic and behavioral outcomes in kindergarten and each year of elementary school (kindergarten through fifth grade)?
>
> Student social emotional scores in pre-k were used to determine the extent to which they predict students' grades and test scores during elementary school, as well as their attendance and disciplinary incidents. It is expected that higher social emotional scores in pre-k would be associated with better academic performance and lower levels of behavioral problems. Since students on average demonstrated gains in their social emotional scores during their year in pre-k, the end of year scores as well as the gains the students made in pre-k were used as predictors.

Research Question 2: How are students' social emotional scores in pre-k related to students' ratings on social emotional measures in sixth grade?

Students' social emotional scores in pre-k and sixth grade were used to examine this relationship. It is expected that students with higher social emotional ratings in pre-k would demonstrate greater social emotional skills in sixth grade. Correlations between each social emotional scale were examined to determine if students' scores in pre-k related to their scores in sixth grade and whether better scores on any subscales in particular were related to each other.

Research Question 3: How do academic and behavioral outcomes differ for students exposed to different SEL programs (RULER, Caring School Community, and pre-k)? How do outcomes differ for students who receive multiple programs, either directly or as an indirect effect of their teachers receiving an intervention (i.e., RULER)?

Students' test scores, grades, attendance, and disciplinary incidents in the 2019-20 academic year were examined as a function of the combination of programs the student received to determine the relationship between receiving a program or combination of programs and academic and behavioral outcomes in fifth grade. We would expect that students who received an SEL intervention would see improvements in academic and behavioral outcomes.

Research Question 4: Are associations with academic and behavioral outcomes different for students who receive the SEL programming over a more extended period of time (i.e., over a greater number of years)?

This question would have examined students' test scores, grades, attendance, and disciplinary incidents in the 2019-20 academic year as a function of the number of years they received an SEL intervention. It was expected that students who received an intervention over a greater period of time would see better academic and behavioral outcomes. Research question 4 could not be investigated due to insufficient variability in receipt of the programs (see the Research Question 4 section in the Results for a full explanation of the limitations encountered in those analyses).

CHAPTER 2: METHODS

The present study used archival data collected during an evaluation of a publicly funded pre-k program during the 2013-14 academic year and archival data collected from the public school district for the academic years from 2014-15 to 2019-20.

2.1 Participants

Participants were included in this study if they were fifth-grade students in a large public school district during the 2019-20 academic year. Protocols from the school district's Office of Accountability state that only two demographic variables can be included in research if not receiving active consent from students' parents/guardians. The two demographic variables needed for this study are the student's school and year in school. As a result, students' race, gender, and other sociodemographic variables were not collected for this study. To fulfill the data request, the school district pulled the full roster of fifth grade students in 2019-20 as the main list, then identified which of those students were enrolled in fourth grade the previous year, in third grade the year before that, etc. The total number of students for which data were received in each grade is as follows: 11936 students at 112 schools in fifth grade; 11048 students at 111 schools in fourth grade; 10217 students at 112 schools in third grade; 9566 students at 110 schools in second grade; 8926 students at 110 schools in first grade; and 8267 students at 109 schools in kindergarten.

Student data received from the school district were matched against social emotional data for this cohort of students in pre-k (2013-14 academic year); 2218-2244 students in this study had social emotional data for the end of the year in pre-k (number varies across subscales) and

1926-1973 students had social emotional data for both time points in pre-k (number varies across subscales).

2.2 Measures

2.2.1 Students' Social Emotional Development

The Devereux Early Childhood Assessment (DECA) for Preschoolers, 2nd edition (LeBuffe & Naglieri, 2012) was completed for each student by their pre-kindergarten teachers at the beginning and end of the academic year in 2013-14. The DECA contains 37 items and assesses social emotional strengths as well as behavioral concerns. Specifically, subscales assess children's Protective Factors (i.e., Initiative, Self-Regulation, Attachment; sample subscale αs = .93, .93, and .79) and Behavioral Concerns (α=.84), which are described in further detail below:

Initiative. Items reflect children's ability to take actions to meet their needs (e.g., good problem-solving skills, being responsible, showing self-awareness, enjoying challenges, and initiating peer interactions). Higher scores indicate more initiative.

Self-regulation. This scale taps children's ability to express emotion and manage behavior constructively (including frustration tolerance, cooperation with peers, and being patient, respectful, and considerate). Higher scores indicate more self-regulation.

Attachment. These items assess children's ability to promote and maintain positive connections with other children and significant adults by showing affection, trust, and optimism. Higher scores indicate more attachment.

Total Protective Factors. This composite score combines the initiative, self-regulation, and attachment subscales. Higher scores on these indicate more protective factors.

Behavioral Concerns. This scale assesses behavior challenges such as aggression, withdrawal, and lack of emotional control. Lower scores indicate fewer behavioral concerns.

Possible scores on these subscales range from 28 to 72, with a norm-based mean of roughly 50 points on each subscale and standard deviations of about 10 points (the actual mean and standard deviation values vary for each subscale). All four subscales are reliable and valid measures for culturally diverse students (Crane et al., 2011; Bulotsky-Shearer et al., 2013).

In addition to the DECA, the Panorama Social emotional Learning Survey for Grades 6-12 assessed students' social emotional skills in sixth grade (Panorama Education, n.d.). The Panorama survey is a self-reported measure that assesses student skills in ten areas: challenging feelings (five items; sample α=.75), emotion regulation (six items; α=.81), growth mindset (six items; α=.77), positive feelings (five items; α=.80), self-efficacy (five items; α=.78), social awareness (eight items; α=.78), supportive relationships (six items; α=.63), cultural awareness and action (eight items; α=.81), sense of belonging (five items; α=.83), and teacher-student relationships (five items; α=.84). Each of the scales is described in more detail below:

Challenging Feelings. How frequently students feel challenging emotions.

Emotion Regulation. How well students control their emotions.

Growth Mindset. Student perceptions of whether they have the potential to change those factors that are central to their performance in school.

Positive Feelings. How frequently students feel positive emotions.

Self-Efficacy. How much students believe they can succeed in achieving academic outcomes.

Social Awareness. How well students consider the perspectives of others and empathize with them.

Supportive Relationships. How supported students feel through their relationships with friends, family, and adults at school.

Cultural Awareness and Action. How often students learn about, discuss, and confront issues of race, ethnicity, and culture in school.

Sense of Belonging. How much students feel that they are valued members of the school community.

Teacher-Student Relationships. How strong the social connection is between teachers and students within and beyond the school.

For nine of the scales, each item is rated on a 5-point Likert scale; the value labels for each response option vary across questions but generally fit the format ranging from "Not at all" to "Almost always." For the Supportive Relationships scale, each item has two response options (Yes or No). Scores are reported as an average across items for each scale. All of Panorama's survey areas have sufficient reliability and have demonstrated convergent and discriminant validity (Panorama Education, 2020).

2.2.2 Students' Academic Performance

Students' academic performance was assessed using final grades and standardized test scores (i.e., End-of-Grade test, Measure of Academic Progress, and Dynamic Indicators of Basic

Early Literacy Skills). Final grades in math and science reported as a score ranging from 0-100 are included as outcomes for students in this study beginning in third grade. Specifically, final grades in math and science are included as outcomes for third and fourth grade students; third quarter (Q3) grades are included as outcomes for fifth grade students in this study as final grades were not reported at the end of the 2019-20 academic year due to closures related to the COVID-19 pandemic. According to the school district, final grades in math and science are included in the consideration process when deciding whether to advance students to the next grade beginning in third grade; they are not considered below third grade. As a result, this study does not include final grades as outcomes for students in kindergarten through second grade in this study.

The North Carolina End-of-Grade Tests (EOGs) are administered to students in elementary school beginning in third grade and are designed to measure student performance on the goals, objectives, and grade-level competencies specified in the North Carolina Standard Course of Study. Student scale scores on the EOGs for reading and math in third and fourth grade are included in this study. Cut scores for proficiency in math are 447 in third grade and 448 in fourth grade and cut scores for proficiency in reading are 438 in third grade and 444 in fourth grade. EOGs were not administered to fifth graders in this study due to the COVID-19 pandemic, so these scores are not included as an outcome in fifth grade (2019-20).

The Measure of Academic Progress (Northwest Evaluation Association, 2011; MAP) is a standardized test administered to first through eighth graders that measures reading and math ability. It is a computer adaptive test that asks students a unique set of questions based on how they respond to previous questions and is administered at the beginning (fall), middle (winter), and end (spring) of the year. Students are given a single score for each subject representing their

achievement level at the end of the test. Spring scores for math and reading are included as outcomes for students in first through fourth grade in this study; winter MAP scores are included as an outcome for fifth grade as the MAP was not administered in the Spring of 2019-20 due to the COVID-19 pandemic. Cut scores for proficiency in each grade are as follows:

First grade: 178 in math, 179 in reading.

Second grade: 189 in math, 188 in reading.

Third grade: 200 in math, 198 in reading.

Fourth grade: 213 in math, 206 in reading.

Fifth grade (Winter scores): 218 in math, 211 in reading.

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002) test measures the acquisition of literacy skills and is administered to students in kindergarten through third grade in this school district. The school district provided two DIBELS scores for this study: a Reading Fluency score and a Reading Composite score. The Fluency score is a combination of fluency scales (i.e., first sound, phoneme segmentation, nonsense word, and oral reading) and the Composite score is a combination of multiple DIBELS scores and provides the best overall estimate of the student's reading proficiency (Dynamic Measurement Group, Inc., 2016). Scores are interpreted based on benchmark goals; benchmarks increase at each administration, so each grade is expected to have higher mean scores than the previous one. Benchmark goals for the Reading Composite score are as follows for each grade: 119 in kindergarten, 155 in first grade, 238 in second grade, and 330 in third grade. Benchmark goals for fluency are calculated for each individual fluency scale and are not provided for the overall

Reading Fluency scale. Studies have found DIBELS to be valid for evaluating early literacy skills (Fien et al., 2010) and educational difficulties (Elliott et al., 2007), and test–retest reliability and inter-rater reliability are adequate (Goffreda & DiPerna, 2010).

2.2.3 Students' Behavioral Outcomes

Students' behavioral outcomes were assessed using school attendance (the total number of days attended during the school year) and number of disciplinary incidents, which includes suspensions (in school and out of school) as well as minor infractions (e.g., incidents resulting in conferences with parents/guardians); these are predictive of long-term academic achievement (Gottfried, 2010; Chu & Ready, 2018).

2.2.4 School-Wide Controls

Two school-wide variables were included in the study to control for some variability in the outcomes based on school-level factors: Overall School Performance and School Socioeconomic Status (SES). Overall School Performance is a grade from 0-100 representing a school's overall academic performance for the year using a combination of achievement on standardized assessments and growth from the previous year (North Carolina Department of Public Instruction, n.d.). The school district provided school SES as an ordinal categorical variable with three levels: low, medium, and high.

2.3 Procedure

2.3.1 DECA Data Collection

As part of evaluating a publicly funded pre-k program during the 2013-14 academic year, teachers were asked to complete DECA social emotional ratings for each of their students at the

beginning and end of the year. Hard copies of DECA surveys for each teacher were distributed to literacy facilitators at a staff meeting on November 12th, 2013, and literacy facilitators distributed the surveys to the teachers they coach. A reminder email to complete the DECA surveys was sent to all teachers after one week. Literacy facilitators collected completed DECA surveys from their teachers, and research team members collected the completed surveys from literacy facilitators at a staff meeting on December 3rd, 2013. The research team received 3166 completed DECA surveys for Time 1. For time two data collection, hard copies of DECA surveys and scantrons were distributed to literacy facilitators on May 20th, 2014, who then distributed the surveys to their teachers. Literacy facilitators collected completed scantron surveys, and research team members collected them at a staff meeting on May 29th, 2014. The research team received 3366 completed DECA surveys for Time 2. For this study, data from both time points demonstrating students' social emotional ratings at the beginning and end of the year will be used to predict outcomes of interest. Students included in the present study were in fifth grade in this school district during the 2019-20 academic year; not all students for whom DECA data were received in pre-k remained in the school district until fifth grade, resulting in a lower number of students with social emotional ratings in pre-k included in the study.

CHAPTER 3: ANALYTICAL APPROACH

All analyses were conducted using IBM SPSS Statistics 25. The analytical approach for this study involved running many linear regression analyses to examine changes in a variety of outcomes across several time points. This raises the concern that running statistical tests on the dataset multiple times can potentially increase the probability of a false positive result (Ranganathan et al., 2016). To help minimize this problem, all comparisons and analyses were conducted as prespecified in the project proposal, which was written before initial analyses were conducted. Additionally, all statistical tests were proposed based on a theoretical backing for the relationships being examined, and results are being reported and interpreted in light of these expected relationships. Because alpha adjustment (reducing the size of the alpha to consider a result "significant") can increase the chances of a false negative result (Drachman, 2012; Ranganathan et al., 2016), this strategy was not used. Researchers suggest alternative strategies to handling multiple testing, such as evaluating the quality of the study and refraining from making treatment decisions based on a single study (Feise, 2002; Drachman, 2012). In this study, the overall pattern of results is also being considered in evaluating possible conclusions to help reduce the likelihood that potential spurious significant results are used to draw conclusions. Considerations for study quality and future directions are addressed in the Discussion section of this paper.

Linear regression analyses were used to examine research questions 1 and 3, and a correlation analysis was used to examine research question 2. Research question 4, which was to assess differences in student outcomes due to the number of years students received a program, was not investigated due to insufficient variability in receipt of the programs. For each regression

analysis, overall school performance grades and school SES were entered simultaneously as controls to account for some variability in student academic and behavioral outcomes due to school attended. One linear regression analysis was conducted for each school year (i.e., kindergarten through fifth grade for research question 1 and fifth grade only for research question 3) and for each outcome of interest (i.e., final grades, MAP, EOG, DIBELS, attendance, and disciplinary incidents. For all regression analyses, standardized regression coefficients were used to examined differences in academic and behavioral outcomes and compared across academic years to determine whether changes in these variables faded over time.

CHAPTER 4: RESULTS

4.1 Preliminary Analyses

IBM SPSS Statistics 25 was used to conduct all analyses for this study. Table 1 displays descriptive statistics for study control and outcome variables in each grade (kindergarten through fifth grade), and Table 2 displays descriptive statistics for end-of-year DECA scores in pre-k and Panorama scores in sixth grade. The total *N* varies across variables due to students missing data on some variables. Descriptive statistics showed no outliers on any of the measures used for this study. Average EOG scores show students largely reached or exceeded proficiency on math and reading in third and fourth grade. Average MAP scores show students reached proficiency in math every year; in reading, students reached proficiency in all years except first grade where they fell two points short of reaching proficiency. Average DIBELS Reading Composite scores show students exceeded proficiency in each year.

Correlations among study variables for each grade are displayed in Tables 3-8. All significant correlations were in the expected directions. The DECA Protective Factors (Initiative, Self-Regulation, and Attachment and Relationships) were significantly positively correlated with each other and with student academic outcomes (EOG scores, MAP scores, DIBELS scores, and final grades) and significantly negatively correlated with DECA Behavior Concerns and student behavioral outcomes (number of days absent from school and number of disciplinary incidents) in every grade, indicating that students with greater protective factors in pre-k had better academic outcomes, had fewer behavior problems, and missed fewer days of school in kindergarten through fifth grade. All student academic outcomes were significantly positively correlated with each other and significantly negatively correlated with DECA Behavior Concerns

and with behavioral outcomes in every grade, indicating that students who performed better academically had fewer behavior problems and missed fewer days of school. The number of days absent from school and the total number of disciplinary incidents were significantly positively correlated with each other and with DECA Behavior Concerns in every grade, indicating that students with more behavior problems missed more days of school and had more disciplinary incidents.

Overall school performance grades and school SES were significantly positively correlated with each other every year, indicating that schools with higher average family incomes had better overall academic performances. Overall school performance and school SES were also significantly correlated in the expected directions with individual student academic and behavioral outcomes in every grade (except disciplinary incidents in kindergarten, which was not correlated with either school-wide variable), indicating that schools with better overall performance and higher average family income had students who performed better academically, had fewer behavior problems, and who missed fewer days of school.

School SES was not correlated with DECA social emotional variables, except in fourth grade when it was significantly correlated with students' DECA Self-Regulation scores (r=.04; p<.05), indicating that schools with higher average family incomes in fourth grade had students with higher self-regulation scores when they were in pre-k. Overall school performance was significantly correlated with DECA Behavior Concerns in every grade (r= -.04 to -.06; p<.01 in kindergarten through second grade, p<.05 in third and fourth grade), indicating that schools with better academic performances had students with fewer behavior problems when they were in pre-k.

4.2 Research Question 1

To examine how students' social emotional scores in pre-k were related to academic and behavioral outcomes in kindergarten and elementary school, one linear regression analysis was conducted for each school year (i.e., kindergarten through fifth grade) and for each outcome of interest (i.e., final grades, MAP, EOG, DIBELS, attendance, and disciplinary incidents). For each regression, students' end-of-year scores on each DECA subscale (*Initiative, Self-Regulation, Attachment and Relationships*, and *Behavior Concerns*) were added as predictor variables. Standardized regression coefficients for each outcome were examined to determine the relationship between end-of-year DECA scores in pre-k and academic and behavioral outcomes in each year. Standardized regression coefficients were also compared across academic years to determine whether changes in these variables faded over time. Regression analyses were then conducted using the change in DECA scores from the beginning to the end of the year in pre-k as predictor variables and using the same outcome variables to allow for examining whether the degree of improvement in social emotional skills in pre-k was predictive of longer-term outcomes.

Results from these analyses are displayed in Tables 9-16 with each table showing results for a different outcome variable. Each table displays two models: the first with school-wide controls and end-of-year DECA scores, and the second model with school-wide controls and DECA change scores. Models for DECA change scores predicting student outcomes showed consistently non-significant results; that is, the DECA change scores were mostly not predictive of student academic and behavioral outcomes. The only variables in these models that were regularly predictive of outcomes were the school-wide controls, overall school performance and

school SES. The results discussed in this section focus on models for end-of-year DECA scores predicting outcomes but results for both models are displayed in Tables 9-16.

R-squared statistics for regressions predicting number of days absent (Table 9) were mostly statistically significant but explained only 1-2% of the variability in the outcome across grades. There were few consistently significant predictors across grades with the exception of overall school performance, which is a significant predictor in almost all grades such that students who attend higher performing schools miss fewer days of school. Higher end-of-year DECA scores in Initiative were predictive of fewer days absent in kindergarten (β= -.11; p<.01) and in fourth grade (β= -.07; p<.05), with a smaller effect size in the later grade. Lower end-of-year Behavior Concerns scores were predictive of fewer days absent in first grade (β=.08; p<.05), third grade (β=.09; p<.05), and fourth grade (β=.09; p<.05), with the effect size remaining consistent across years. End-of-year Attachment and Relationships scores were predictive of number of days absent only in fourth grade (β=.07; p<.05) such that higher scores were predictive of more days absent from school, which is not the expected direction of the relationship.

Models predicting the total number of disciplinary incidents throughout the school year (Table 10) still accounted for a small percentage of the variability in the outcome (R^2= .03-.05; p<.01). School-wide control variables were mostly not predictive of disciplinary incidents; higher overall school performance was predictive of fewer disciplinary incidents in third grade (β= -.08; p<.01). Higher end-of-year Initiative scores in pre-k were predictive of more disciplinary incidents in every grade (β=.07-.14; p<.01-.05) with higher effect sizes in later grades, which is an unexpected result given that these variables were mostly not correlated with

each other (but correlations were in the expected negative direction). Lower end-of-year Behavior Concerns scores were predictive of fewer disciplinary incidents in every grade (β=.11-.22; p<.01), and higher Self-Regulation scores were predictive of fewer disciplinary incidents in first grade (β= -.10; p<.05) and fifth grade (β= -.08; p<.05); these relationships are in the expected direction.

All the models predicting EOG scores (Table 11) had significant R-squared values and explained a much higher percentage of the variability in the outcomes (12-14%) compared to models predicting behavioral outcomes. Students with higher end-of-year Initiative scores in pre-k had higher EOG scores (β= .29-.24; p<.01) in grades three and four, as did students who scored lower on Behavior Concerns (β= -.14 to -.17; p<.01), with effect sizes decreasing slightly from third to fourth grade. Higher end-of-year Attachment and Relationships scores were predictive of lower EOG scores in math and reading (β= -.10 to -.15; p<.01), and higher end-of-year Self-Regulation scores were predictive of lower EOG scores in Reading only (β= -.07 to -.08; p<.05) in both years, which is unexpected as these variables were positively correlated.

As in the models predicting EOG scores, the models predicting MAP scores in math (Table 12) and reading (Table 13) show significant R-squared values, with the end-of-year DECA score models explaining a higher percentage of variability in MAP scores (12-18%) compared to models predicting behavioral outcomes. End-of-year DECA scores in pre-k showed a similar pattern of predicting MAP scores as they did EOG scores. Students having higher end-of-year Initiative scores in pre-k was predictive of higher MAP scores (β math=.34-.40; β reading=.30-.42; p<.01), as was lower end-of-year Behavior Concerns scores (β math= -.17 to -.21; β reading= -.15 to -.19; p<.01) for grades one through five. Higher end-of-year Attachment

and Relationships scores in pre-k were predictive of lower MAP scores in every grade (β math= -.16 to -.17; β reading= -.12 to -.14; p<.01), and higher end-of-year Self-Regulation scores were predictive of lower MAP math scores in first grade (β= -.10; p<.05) and fourth grade (β= -.07; p<.05) and lower MAP reading scores in first grade (β= -.09; p<.05) and fifth grade (β= -.08; p<.05). Once again, the negative relationships for Attachment and Relationships and Self-Regulation scores are contrary to their initial correlations with MAP scores, which were significant in a positive direction.

Models predicting the DIBELS reading fluency scores and reading composite scores are depicted in Table 14 and Table 15, respectively. Models with end-of-year DECA scores explain a greater amount of variability in DIBELS scores (9-15%) compared to models predicting behavioral outcomes, but less on average than models predicting EOG and MAP scores. Like the previous models predicting academic outcomes, end-of-year Initiative and Behavior Concerns scores in pre-k are predictive of DIBELS scores in the expected direction while Attachment and Relationships and Self-Regulation scores are predictive in the opposite direction than would have been expected based on initial correlations. Higher end-of-year Initiative scores in pre-k are predictive of higher DIBELS scores (β fluency=.30-.34; β composite=.32-.34; p<.01) and lower Behavior Concerns scores are predictive of higher DIBELS scores (β fluency= -.13 to -.15; β composite= -.09 to -.17; p<.01) in every grade through third grade. Higher end-of-year Attachment and Relationships scores in pre-k is predictive of lower DIBELS scores (β fluency= -.09 to -.13; β composite= -.07 to -.13; p<.01) in every grade, and higher end-of-year Self-Regulation scores are predictive of lower reading fluency scores in every grade (β= -.10 to -.12; p<.01) and lower reading composite scores in grades one through three (β= -.11 to -.13; p<.01).

Regression results for DECA scores predicting final grades in math and science in third through fifth grade are displayed in Table 16. The models for end-of-year DECA scores explain a greater amount of variability in math final grades on average (5-13%) compared to science final grades (4-7%). The R-squared values for these models are also on average lower than the models predicting other academic outcomes, suggesting end-of-year DECA scores are not as good at predicting final grades compared to predicting scores on standardized assessments. The pattern of end-of-year DECA scores predicting student academic outcomes continues in these models. Higher end-of-year Initiative scores in pre-k are predictive of higher final grades in math (β=.13-.23; p<.01) and science (β=.13-.19; p<.01), and lower end-of-year Behavior Concerns scores are predictive of higher final grades in math (β= -.11 to -.18; p<.01) and science (β= -.10 to -.15; p<.01) in grades three through five. Higher end-of-year Attachment and Relationships scores in pre-k are predictive of lower final grades in math (β= -.07 to -.13; p<.01) and science (β= -.06 to -.08; p<.01) in grades three through five. End-of-year Self-Regulation scores were not predictive of final grades.

In sum, the first research question examined how students' social emotional scores in pre-k related to academic and behavioral outcomes later in school. Results showed that, among the social emotional scales examined in this study, students' Initiative and Behavior Concerns scores in pre-k were the best predictors of later outcomes in kindergarten and elementary school compared to the other social emotional scales. Specifically, students who had higher Initiative and fewer Behavior Concerns in pre-k performed better on almost all academic measures later in school. Similarly, students with better Initiative and Behavior Concerns scores in pre-k had higher attendance later in school, though this relationship was much smaller than those found for academic outcomes. Students with fewer Behavior Concerns in pre-k also had fewer disciplinary

incidents throughout kindergarten and elementary school, an expected finding. Students with higher Initiative scores in pre-k also had more disciplinary incidents later in school, an unexpected finding with a small effect size.

4.3 Research Question 2

A correlation analysis was used to examine how students' social emotional scores on the DECA in pre-k were related to students' ratings on the Panorama social emotional measure in sixth grade. Students' end-of-year scores on each DECA subscale in pre-k, the change in students' DECA scores from the beginning to the end of the year, and students' scores on each Panorama subscale in sixth grade were included in the correlation. Results are displayed in Table 17. There were few significant relationships between Panorama scores and DECA scores. For end-of-year DECA scores, the only significant relationship was with the Panorama Social Awareness subscale which was significantly correlated with Self-Regulation (r=.07; p<.01), Attachment and Relationships (r=.06; p<.05), and Behavior Concerns (r= -.07; p<.01). This indicates that students who had better self-regulation, better attachment and relationships, and fewer behavior problems in pre-k had more social awareness in sixth grade.

The Panorama Challenging Feelings subscale was correlated with DECA change scores in Attachment and Relationships (r= -.06; p<.05) and Behavior Concerns (r= .06; p<.05) such that students who had greater reductions in their attachment and relationships and greater increases in behavior problems from the beginning to the end of the year in pre-k experienced more challenging feelings in sixth grade. DECA change scores in Initiative were correlated with the Panorama Positive Feelings (r= -.06; p<.05) and Supportive Relationships (r= -.08; p<.01) subscales, indicating that students who decreased more in Initiative from the beginning to the

end of the year in pre-k experienced more positive emotions and felt more supported in their relationships in sixth grade. There were no other relationships among Panorama and DECA scores.

In sum, the results of this examination were mostly not significant, with no particular social emotional skill in pre-k standing out as being a strong predictor of later social emotional functioning. The only consistent relationships were among pre-k social emotional skills and Social Awareness in sixth grade, indicating that better social emotional skills in pre-k were related to a greater ability to see and empathize with others' perspectives in sixth grade. No other significant relationships emerged, even among scales that we would have expected to be related (e.g., Self-Regulation in pre-k and Emotional Regulation in sixth grade, or Attachment and Relationships in pre-k and Teacher-Student Relationships in sixth grade).

4.4 Research Question 3

Associations with academic and behavioral outcomes across all SEL programs (RULER, Caring School Community, and pre-k) were compared using a series of dummy-coded variables identifying which program/combination of programs each student received through fifth grade. There were eight program variables in total, labeled as follows: no program, RULER only, CSC only, pre-k only, RULER + CSC, RULER + pre-k, CSC + pre-k, RULER + CSC + pre-k. Each variable was coded 1=student received this combination of programs and 0=student did not receive this combination of programs.

The most recent data for each outcome variable were used (i.e., data in fifth grade) since the predictor variables include the program(s) each student received through fifth grade. A linear regression analysis was run for each program variable and for each outcome of interest in fifth

grade (i.e., final grades, MAP, attendance, and disciplinary incidents), where each program variable was entered as the predictor. Due to the overlap among the program variables, each was entered into a regression separately to avoid reducing the unique variability accounted for by each predictor. Standardized regression coefficients were examined to determine the relationship between receiving a program or combination of programs and academic and behavioral outcomes in fifth grade.

The total number and percentage of students who received each combination of programs (ranging from no program to all three programs) is displayed in Table 18. The number of students varies widely across groups, with 3.3% of students receiving all three programs and 32.7% of students receiving only the Caring School Community (CSC) program.

Correlations among the combination of programs students received and their academic and behavioral outcomes in fifth grade are displayed in Table 19. The no program and CSC only groups were significantly correlated with school SES such that students in these groups also attended schools with higher overall family income levels. All other program combination groups were significantly negatively correlated with school SES, indicating that students in these groups attended schools with lower average family income levels. Receiving no program and receiving only the CSC program were both positively correlated with all academic measures (r no program=.06-.10; r CSC=.10-.16; p<.01). For every other combination of programs, results show significant negative correlations indicating that these combinations of programs were related to poorer academic performance in fifth grade. There are fewer significant correlations among program combination and behavioral outcomes. Students who received only CSC had better behavioral outcomes on both measures (i.e., fewer days absent from school and fewer

disciplinary incidents; r= -.04 to -.05; p<.01) than students who received other combinations of programs. Students who received pre-k and CSC missed fewer days of school in fifth grade (r= -.03; p<.01). Receiving no program or receiving pre-k only was correlated with more disciplinary incidents in fifth grade (r=.02; p<.05). Receiving only the RULER program was correlated with worse behavioral outcomes on both behavioral measures (r=.03-.04; p<.01) and students who received both RULER and CSC had significantly more days absent from school (r=.06; p<.01).

Linear regression results for combinations of programs predicting student academic and behavioral outcomes in fifth grade are displayed in Table 20. School SES was entered as a control variable for all analyses and is a significant predictor of the outcome in every model, indicating that school-level factors are a significant predictor of student academic and behavioral outcomes. R-squared values are significant for every model but vary widely across models; models explain only 1-2% of the variability in the behavioral outcomes and explain 12-15% of the variability in academic outcomes.

Similar to the correlation results, receiving only the RULER program was predictive of poorer scores on every academic measure (β= -.03 to -.06; p<.01) and predictive of worse behavioral outcomes on both measures (β=.02; p<.05) in fifth grade. Additionally, receiving a combination of RULER and CSC was predictive of poorer academic outcomes on every measure (β= -.03 to -.04; p<.01), and predictive of missing more days of school (β=.05; p<.01). Also similar to the correlation results, receiving no program and receiving only the CSC program were both predictive of better scores on almost all academic measures (β no program=.03-.05; β CSC=.03-.07; p<.01) in fifth grade. No other combination of programs was predictive of

academic outcomes although correlations showed a relationship, indicating that all the variability in the outcomes explained by these models was captured by School SES.

In models predicting behavioral outcomes, receiving pre-k only, CSC and pre-k, or receiving a combination of all three programs was predictive of missing fewer days of school in fifth grade (β = -.02 to -.04; p<.01-.05). Receiving no program was predictive of more disciplinary incidents (β =.03; p<.01) and receiving only CSC or a combination of all three programs was predictive of fewer disciplinary incidents (β = -.02 to -.04; p<.01-.05) in fifth grade.

In sum, results indicated that students who received only the Caring School Community (CSC) program showed the best outcomes on academic and behavioral measures when compared to other combinations of programs. Receiving only CSC was associated with better academic achievement on almost all measures as well as fewer disciplinary incidents in fifth grade. Students who received only pre-k missed fewer days of school in fifth grade, but there were no other association with student outcomes. Students who received only the RULER program showed the worst outcomes; receiving only the RULER program was associated with poorer performance on all academic outcomes, as well as more disciplinary incidents and more days absent from school. When examining students who received a combination of programs, results do not indicate that receiving more social emotional programs was associated with better outcomes overall. Students who received both CSC and RULER showed worse outcomes on academic measures and missed more days of school. Students who received all three programs missed fewer days of school, had fewer disciplinary incidents, and had better science grades, though the effect sizes of these associations were small.

4.5 Research Question 4

The last research question was developed to examine whether associations with academic and behavioral outcomes differed for students who receive SEL programming over a longer period of time. Two count variables were created to determine how many years each student received each SEL program (RULER and CSC). The plan was to run a linear regression analysis for each count variable and for each outcome of interest in fifth grade (i.e., final grades, MAP, attendance, and disciplinary incidents), where each count variable would be entered as the predictor. Due to the overlap among the count variables as some students received multiple SEL programs, each count variable would be entered into a regression separately to avoid reducing the unique variability accounted for by each predictor. Standardized regression coefficients would be examined to determine the relationship between the number of years students received a program and academic and behavioral outcomes in fifth grade, as well as whether any program had stronger associations with outcome variables over time.

Count variables were created to count the number of years students received RULER or CSC through fifth grade with the intention of running linear regression analyses to examine whether the number of years students received each program was related to academic and behavioral outcomes. However, frequency analyses (displayed in Table 21) show a lack of variability in the number of years students received each program. In sum, 93.8% of RULER students and 96.5% of CSC students received the program for either zero years or two years. This distribution does not allow for an analysis of dosing effects for each year students received the program; rather, an analysis using these variables would essentially compare students who

did and did not receive the program, a relationship which was examined in research question 3. As a result, linear regression analyses were not conducted for research question 4.

CHAPTER 5: DISCUSSION

This study investigated several questions related to the impact of social emotional programming on students' outcomes in kindergarten and elementary school. The first research question examined how students' social emotional scores in pre-k related to academic and behavioral outcomes later in school and found that students with greater social emotional skills on some measures (Initiative and Behavior Concerns, in particular) performed better on almost all academic measures later in school. This seems to be consistent with studies showing that better social emotional skills are related to better academic performance (Blair & Razza, 2007; Gawrilow et al., 2014; McClelland et al., 2007; Ponitz, et al., Morrison, 2009).

Students' social emotional skills in pre-k were less predictive of behavioral outcomes later in school; effect sizes predicting school attendance were positive but much smaller. While research has identified factors related to school absenteeism, such as engagement in school (Gottfried, 2017), it is likely that attendance is related to many factors outside of a student's control (such as health status and parent decisions), particularly for younger students. This could explain the weaker relationship between social emotional skills and school attendance.

The other behavioral outcome examined was disciplinary incidents, which had mixed results. Students who had fewer behavior problems in pre-k had fewer disciplinary incidents throughout school, which was expected. However, students who scored more highly in Initiative in pre-k had more disciplinary incidents later in school. This is an unexpected finding; some previous research has shown a relationship between pre-k and greater aggressive or externalizing behaviors in elementary school (Magnuson et al., 2007), but it is unclear why Initiative would predict this relationship, and further investigation of this relationship could yield more

information. The Initiative items measure a child's ability to take actions to meet their needs, so it is possible that students high in Initiative may also be more aggressive or less prone to "rule following". Also of note is that Initiative was not correlated with disciplinary incidents in the preliminary analyses, suggesting that this relationship is caused by extraneous variables.

Another unexpected finding in this study was that higher Attachment and Relationships scores in pre-k were related to poorer outcomes on almost every academic and behavioral measure later in school; Self-Regulation showed a similar pattern but showed a significant relationship with fewer outcome measures. A possible explanation for this relationship is the multilevel nature of the data such that students are nested within schools, and it is likely that some variability in student outcomes is a result of school-level factors. This could be especially true of scores on Attachment and Relationships, which measures a student's relationship with their teacher and other adults at their school. While this study was able to account for some variability in the outcomes by including school-level control variables in all analyses, it is of note that the school-level variables tended to have strong relationships with and explain a high degree of variability in the outcomes. Additionally, this study did not have access to information about the students' individual classrooms or teachers within school, and therefore did not include any classroom-level controls in analyses. It is possible that variability in outcomes due to classroom membership could also explain the unexpected relationship between Attachment and Relationships and outcome measures. An examination of these data using a multi-level approach could illuminate some of these questions.

A notable finding of this study was the duration of the relationships between social emotional scores in pre-k and outcomes in later school years. Previous research examining

relationships between pre-k and outcomes over time tend to show strongest effects in kindergarten and a pattern of decreasing effects in subsequent years. However, the results of this study do not reflect that pattern. For social emotional scores that had a significant relationship with individual outcomes, those relationships tended to remain significant over time, and effect sizes did not show a pattern of decreasing, even sometimes increasing in fifth grade. One potential explanation for this is that many studies on the subject examine outcomes as a function of group differences (i.e., attended pre-k vs. did not attend pre-k, e.g., Magnuson et al., 2007) rather than using social emotional measures as predictors. However, some studies that have examined social emotional skills as predictors have found similar results; for example, Claessens and colleagues (2009) found only attention skills at school-entry predicted academic achievement in fifth grade, and no significant effects for other socioemotional skills. The results of the present study could also be explained by factors specific to the school district, such as the way the pre-k curriculum was implemented, which were not measured in this study. Additionally, results could vary across schools within the district, for example, due to school climate (Shukla et al., 2016), an element that was not controlled for in these analyses. With these considerations in mind, the results of this study could be promising in pointing to the long-term impacts of social emotional skills on student academic and behavioral outcomes, indicating that there is some longevity of impacts of these competencies on later outcomes for some social emotional skills, such as initiative, and that focusing on developing those skills at an early age could have long-term benefits.

The second research question examined in this study was how students' social emotional scores in pre-k related to students' ratings on social emotional measures in sixth grade. The results of this examination were mostly not significant, showing no pattern of social emotional

skills in pre-k predicting later social emotional functioning. This could be due to the amount of time that had elapsed between the administration of the measures, indicating that skills detected in pre-k have faded by sixth grade. Additionally, pre-k measures were teacher-completed while the sixth grade measure was self-reported by students, so a lack of congruence among the scores could reflect the differing perspectives. Discrepancies among self-reported measures and reports by others are well-documented in the literature (Achenbach, 2006).

The third research question examined in this study was how associations with academic and behavioral outcomes in fifth grade differed across the social emotional learning (SEL) programs students in this school district received (i.e., RULER, Caring School Community, and pre-k), and whether receiving a combination of programs impacted these relationships. Students who received only the Caring School Community (CSC) program showed the best outcomes on academic and behavioral measures compared to other combinations of programs, and students who received only the RULER program showed the worst outcomes on all measures. An important consideration is that when the data for this study were collected, RULER had only been implemented with teachers in the school district for two years (with student programming to begin in year three of implementation). As a result, the present effort was examining student outcomes as a function of the intervention with teachers rather than direct programming with students, and it is possible that RULER's intervention with students directly would show more positive results. It is also possible that, if RULER's intervention with teachers can have an impact on students' outcomes, there was not sufficient time for implementation to show a difference at the time of this study.

Results did not indicate that receiving more social emotional programs was associated with better outcomes overall. Of note when interpreting these results is the variability in the number of students across groups, as the number of students who received different combinations of programs varied widely. For example, the group with the highest number of students was the CSC-only group, for which we saw the most positive results; the groups which included the smallest number of students are those for which we saw the fewest significant results (e.g., the group of students who received all three programs). The lack of equivalence of the groups could have skewed the results.

Another factor that may be contributing to the inequivalence among groups is a lack of data related to other pre-k programs attended by students. This study examined outcomes associated with attending one particular public pre-k program, but students have access to other pre-k options that are not captured in this study and could be impacting results. In illustration of this point, receiving none of the programs examined here was associated with positive outcomes on academic measures and fewer disciplinary incidents; this could indicate that students who fell into the "no program" group may have received other programs not assessed in this study.

Another consideration when comparing these groups of students is the possibility of selection issues. The pre-k program examined in this study serves children who, on the basis of a multi-step screening process, are found to be developing behind their same-age peers (e.g., on language, cognitive development, social emotional maturity) and are at risk of not being ready for kindergarten. As a result, when examining group differences for students who attended the pre-k program in this study vs. students who did not attend this specific pre-k program, it is not necessarily unexpected that these students would perform more poorly than their peers on

academic measures later in school. In fact, since results of this study showed mostly no differences between students who attended pre-k and other groups of students, this could indicate that these students who were at-risk for falling behind in school were better prepared and able to match their same-age peers in performance because they attended this pre-k program. The issue of selection for pre-k programs has implications as well for students in this study who are labeled as receiving "no program"; some of these students were not selected for enrollment in this pre-k program and were therefore considered "school ready", potentially contributing to the higher outcomes we see for this group of students in later years.

Also related to selection issues is the fact that receiving no program and receiving CSC only were both significantly positively correlated with school SES; that is, students in these groups also attended schools that tended to have higher average family income levels. This has implications for interpreting the more positive academic and behavioral outcomes associated with these groups, as higher SES schools also tend to have more resources and be higher performing overall. Especially in the case of the CSC only group, the more positive results associated with this program could be attributed to factors related to school SES rather than program implementation.

Another factor to consider when examining the outcomes associated with social emotional programming is that this study did not have information regarding the implementation of the CSC and RULER curriculums in classrooms. There may have been variability in the implementation of these programs across schools and across classrooms that could impact the results, and it is not possible to differentiate between low-fidelity and high-fidelity implementation when examining associations with outcomes in this study. Using a multi-level

approach to the data analysis which controls for school-level factors in the outcomes could account for some of the variability in the outcomes due to differences in implementation and buy-in across schools, but an objective measure of implementation in each classroom would provide the most accurate results.

The final research question of this study was whether associations with academic and behavioral outcomes differed for students who received the SEL programming over a more extended period (i.e., over a greater number of years). However, due to a lack of variability in the number of years students received each program, this question was not investigated. This study was limited by the fact that CSC and RULER had only been implemented in the school district for two years at the time of the data collection. Future studies with the school district may be able to examine this question.

5.1 Implications

The results of this study provide preliminary support for the notion that social emotional skills in pre-k could have associations with student outcomes well into elementary school. In particular, measures of students' Initiative and Behavior Concerns in pre-k showed strong associations with academic and behavioral outcomes through fifth grade, indicating that providing support for these skills in pre-k could have long-term benefits. Future studies examining the relationship between Initiative scores in pre-k and disciplinary incidents in elementary school could lead to targeted interventions to improve student outcomes in this area. This could also illuminate the literature related to mechanisms through which students who attend pre-k have been shown to have more aggressive behaviors in elementary school (Magnuson et al., 2007).

The results of this study also show preliminary support for associations between the use of the Caring School Community program and better academic and behavioral outcomes for students. Given the limitations of this study and the fact that the CSC program had only been implemented in the school district for two years at the time of data collection, this school district could benefit from future studies examining the impact of the CSC program on student outcomes. Additionally, these results raise questions about the equity of the implementation of this intervention given that CSC tended to be implemented in higher SES schools and demonstrated more positive outcomes. This could mean that the intervention associated with the most positive outcomes is being delivered mostly to higher SES schools; alternatively, it could mean that this intervention, when delivered to lower SES schools, produces less positive results compared to higher SES schools. The school district would benefit from examining implementation of this program in a greater variety of schools to determine whether impacts are equitable across different demographics and income levels.

5.2 Limitations

There are several limitations to this study. Many of these limitations have already been discussed, including the multilevel nature of the data, a lack of measures of the implementation fidelity of social emotional programs in this school district, and the possibility that students have received other programming not captured by these data. All of these factors limit the conclusions that can be drawn from this study and the generalizability of the results.

Another limitation of this study is the missing and potentially skewed data for students in fifth grade in the 2019-20 academic year due to the COVID-19 pandemic. School closures due to the pandemic resulted in missing data points for that year as the Spring MAP and EOG

administrations were canceled, which also resulted in missing overall school performance grades for that year without standardized assessments to calculate the rating (of note is that results were not significantly different when examining Winter MAP scores as predictors across school years compared to Spring scores). Data that were received from the school district for this year may still be skewed due to the pandemic, as online instruction likely made collecting attendance and recording disciplinary incidents more difficult. Additionally, any implementation of CSC and RULER programming was likely interrupted in the Spring of that year, though there are no measures of implementation to confirm this possibility. Given the already short timeline of implementation of these programs in the school district, this could have affected the degree of the relationships these programs had with fifth grade outcomes examined in research question 3.

A further limitation of this study is that the method which the school district used to fulfill the data request resulted in students who have repeated a year being dropped from the dataset. By using the fifth grade roster as the reference list and pulling students from each previous year based on whether they were in fifth grade in 2019-20, students who were held back a year between pre-k and fifth grade were not included. The result is that this study does not include potentially the lowest performing students in the school district, which may skew the results towards students who are average or higher performing, inflating effect sizes, and reducing the generalizability of the results. While the number of students who were held back is likely very small and might not affect the overall effect sizes, the lowest performing students in the district are a group of interest when examining whether different social emotional programs are related to better outcomes; it would be important to know whether these programs can help the students who need it most.

An additional limitation of this study is that, due to restrictions on the data that could be requested from the school district without active parental consent, it was not possible to disaggregate results to examine differential impacts on students of different races and ethnicities, or students from families of different income levels. Using average scores across an entire sample does not provide information about whether outcomes are equitable across demographic groups, information that can be used to inform programmatic decisions about implementation and monitoring (Sharpe, 2019; National Center for Mental Health Promotion and Youth Violence Prevention, 2012). While we know that students selected for the pre-k program of focus here were disproportionately low income and were disproportionately Black and Hispanic, the ability to disaggregate results would be important when examining impacts of different social emotional programs such as CSC and RULER.

5.3 Future Directions

The results of this study suggest a number of future directions for examining associations between social emotional skills and academic and behavioral outcomes, some of which have already been discussed. As previously mentioned, future studies examining outcomes of social emotional programming in this school district should disaggregate results based on different sociodemographic groups (race/ethnicity, household income, gender) to examine whether impacts are equitable. It is critical to determine the effectiveness and equity of a program for different groups of children to ensure desired outcomes are achieved for everyone.

Another future direction for this research, also noted previously, is the need to include measures of program implementation when examining outcomes associated with social emotional programs. Given the variability in program implementation, it is important to know

which outcomes are occurring when programs are implemented with fidelity and where there are areas for growth in the implementation that could improve outcomes for students (Durlak & DuPre, 2008). These data could help inform programmatic decisions about whether and how to roll out a new program in schools.

This school district could benefit from another study of outcomes associated with various social emotional programs in the future, especially related to CSC and RULER. Both of these programs had only been implemented for a short time at the time of this study, and with the additional factor of interruptions due to COVID-19 in 2020, it is possible that we could see greater effect sizes in a few years. Additionally, due to the school district's planned rollout of RULER, this study examined student outcomes associated with this program as a function of intervention with teachers rather than direct programming with students. It is possible that effect sizes associated with RULER could change when the school district does a full rollout of the program with students.

An additional benefit of examining outcomes associated with social emotional programs again in the future would be the opportunity to follow this particular cohort of students even further into their middle school years. Since the results of this study showed significant effects associated with social emotional skills in pre-k on some measures through fifth grade, it would be interesting to see whether these relationships continue to manifest in later years. This would add significantly to the literature related to the duration of pre-k's effects on academic and behavioral outcomes throughout a student's schooling.

Table 1

Descriptive statistics for study variables in each school year

	K			Grade 1			Grade 2			Grade 3			Grade 4			Grade 5		
	N	*M*	*S.D.*	*N*	*M*	*S.D.*	*N*	*M*	*S.D.*	*N*	*M*	*S.D.*	*N*	*M*	*S.D.*	*N*	*M*	*S.D.*
School-wide Controls																		
School Performance	8228	58.9	19.2	8914	62.2	17.4	9552	62.4	17.5	10200	65.7	13.4	11029	65.2	13.5	-	-	-
School SES Status	8215	1.8	.8	8867	1.9	.8	9496	1.9	.8	10139	1.9	.8	10975	1.9	.8	11844	1.9	.8
Student Behavioral Outcomes																		
Days Absent from School	8143	8.5	7.6	8846	7.4	6.6	9484	7.7	6.7	10149	6.9	6.7	11016	7.7	7.6	11936	5.4	5.8
Total Disciplinary Incidents	8267	.2	1.6	8926	.2	1.4	9566	.2	1.4	10217	.3	1.6	11048	.3	1.6	11936	.3	1.5
Student Academic Outcomes																		
EOG Math	-	-	-	-	-	-	-	-	-	10002	452.7	10.0	10846	549.7	10.2	-	-	-
EOG Reading	-	-	-	-	-	-	-	-	-	10007	439.2	10.8	10849	444.4	11.1	-	-	-
MAP Math	-	-	-	5599	180.2	15.4	8740	190.3	12.8	9736	203.2	13.8	10575	213.5	15.5	11493	218.4	16.9
MAP Reading	-	-	-	5099	177.9	15.4	8630	189.6	16.7	9834	199.8	16.4	10534	206.8	16.9	11424	211.1	17.1
DIBELS Fluency	-	-	-	8336	72.2	37.2	9069	100.3	41.6	9600	111.1	42.1	-	-	-	-	-	-
DIBELS Composite	7189	156.7	45.9	8336	204.7	86.8	9069	288.0	108.8	9600	374.3	137.2	-	-	-	-	-	-
Math Final Grade	-	-	-	-	-	-	-	-	-	9905	82.4	10.5	10805	81.7	10.7	11765	81.0	12.5
Science Final Grade	-	-	-	-	-	-	-	-	-	9888	90.1	7.9	10774	89.8	8.5	11756	83.7	11.0

Note. K=Kindergarten. S.D.=Standard Deviation. SES=Socioeconomic Status. EOG=End of Grade. MAP=Measure of Academic Progress. DIBELS=Dynamic Indicators of Basic Early Literacy Skills. Total *N* varies when students do not have a score for every item in a scale or for every variable. MAP scores for 2019-20 (Grade 5) are Winter scores as the test was not administered in the Spring. Final grades in math and science for 2019-20 (Grade 5) are Q3 grades as final grades were not recorded that year. Results are for the same cohort of students across each grade.

Table 2

Descriptive statistics for social emotional scores on DECA and Panorama

	N	Min	Max	*M*	*S.D.*
End-of-year DECA Scores					
Initiative	2218	28	72	54.40	11.08
Self-Regulation	2240	28	70	55.98	10.36
Attachment/Relationships	2244	28	71	51.86	10.03
Behavior Concerns	2227	28	72	44.10	10.30
Panorama Scores					
Challenging Feelings	7846	1	5	3.40	0.82
Emotion Regulation	7824	1	5	3.21	0.80
Growth Mindset	7837	1	5	3.54	0.85
Positive Feelings	7845	1	5	3.80	0.81
Social Awareness	7861	1	5	3.69	0.63
Self-Efficacy	7859	1	5	3.41	0.77
Supportive Relationships	7801	1	2	1.78	0.24
Cultural Awareness and Action	7227	1	5	3.21	0.77
Sense of Belonging	7260	1	5	3.43	0.83
Teacher-Student Relationships	7261	1	5	3.99	0.85

Note. S.D.=Standard Deviation. DECA=Devereux Early Childhood Assessment. Total *N* varies when students do not have a score for every item in a scale. Scores are for the same cohort of students in pre-k (DECA) and 6th grade (Panorama).

Table 3

Correlations among end-of-year DECA scores and outcome variables in kindergarten

	Initiative	Self-Regulation	Attach/ Relation	Behavior Concerns	School Perform	School SES	Days Absent	Disciplinary Incidents	DIBELS Composite
Initiative	1								
Self-Regulation	.61**	1							
Attach/Relation	.66**	.54**	1						
Behavior Concerns	-.53**	-.77**	-.42**	1					
School Perform	.02	.03	.00	-.06**	1				
School SES	-.02	.01	-.02	-.01	.69**	1			
Days Absent	-.11**	-.08**	-.06**	.09**	-.19**	-.16**	1		
Discipline Incidents	-.02	-.15**	-.05*	.17**	-.02	-.02	.06**	1	
DIBELS Composite	.26**	.15**	.20**	-.17**	.27**	.27**	-.16**	-.05**	1

Note. *p<.05. **p<.01. SES=Socioeconomic Status. DIBELS=Dynamic Indicators of Basic Early Literacy Skills. N for correlations with DECA scores = 1953-2244; N for other correlations = 7146-8267. Total *N* varies when students do not have a score for every item in a scale or for every variable. Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors on most measures (when relating Behavior Concerns with Days Absent and Disciplinary Incidents, which are also reverse scored, positive effect sizes reflect a reduction in problem behaviors).

Table 4

Correlations among end-of-year DECA scores and outcome variables in first grade

	Initiative	Self-Regulation	Attach/ Relation	Behavior Concerns	School Perform	School SES	Days Absent	Disciplinar Incidents	MAP Math	MAP Reading	DIBELS Fluency	DIBELS Composite
Initiative	1											
Self-Regulation	.61**	1										
Attach/Relation	.67**	.55**	1									
Behavior Concerns	-.54**	-.77**	-.42**	1								
School Perform	.03	.03	.00	-.06**	1							
School SES	-.01	.02	-.02	-.01	.69**	1						
Days Absent	-.05*	-.05*	-.03	.08**	-.16**	-.13**	1					
Disciplin Incid	-.02	-.16**	-.06**	.16**	-.07**	-.08**	.12**	1				
MAP Math	.34**	.21**	.13**	-.27**	.36**	.34**	-.12**	-.06**	1			
MAP Reading	.36**	.21**	.15**	-.26**	.39**	.37**	-.12**	-.07**	.83**	1		
DIBELS Fluency	.27**	.14**	.09**	-.19**	.38**	.37**	-.15**	-.07**	.63**	.75**	1	
DIBELS Composite	.26**	.14**	.10**	-.20**	.35**	.34**	-.14**	-.07**	.63**	.74**	.94**	1

Note. *p<.05. **p<.01. SES=Socioeconomic Status. MAP=Measure of Academic Progress. DIBELS=Dynamic Indicators of Basic Early Literacy Skills. N for correlations with DECA scores = 1291-2214; N for other correlations = 4975-8926. Total *N* varies when students do not have a score for every item in a scale or for every variable. Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors on most measures (when relating Behavior Concerns with Days Absent and Disciplinary Incidents, which are also reverse scored, positive effect sizes reflect a reduction in problem behaviors).

Table 5

Correlations among end-of-year DECA scores and outcome variables in second grade

	Initiative	Self-Regulation	Attach/ Relation	Behavior Concerns	School Perform	School SES	Days Absent	Disciplinar Incidents	MAP Math	MAP Reading	DIBELS Fluency	DIBELS Composite
Initiative	1											
Self-Regulation	.61**	1										
Attach/Relation	.66**	.55**	1									
Behavior Concerns	-.54**	-.77**	-.42**	1								
School Perform	.03	.01	.00	-.06**	1							
School SES	-.01	.02	-.02	-.02	.68**	1						
Days Absent	-.07**	-.05*	-.05*	.07**	-.15**	-.13**	1					
Disciplin Incid	-.02	-.14**	-.06**	.17**	-.07**	-.09**	.12**	1				
MAP Math	.30**	.19**	.11**	-.24**	.41**	.38**	-.16**	-.09**	1			
MAP Reading	.31**	.21**	.14**	-.26**	.39**	.38**	-.14**	-.10**	.80**	1		
DIBELS Fluency	.25**	.12**	.10**	-.17**	.42**	.40**	-.15**	-.08**	.68**	.82**	1	
DIBELS Composite	.28**	.13**	.13**	-.18**	.41**	.38**	-.15**	-.09**	.67**	.80**	.90**	1

Note. *p<.05. **p<.01. SES=Socioeconomic Status. MAP=Measure of Academic Progress. DIBELS=Dynamic Indicators of Basic Early Literacy Skills. N for correlations with DECA scores = 1973-2202; N for other correlations = 8523-9566. Total *N* varies when students do not have a score for every item in a scale or for every variable. Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors on most measures (when relating Behavior Concerns with Days Absent and Disciplinary Incidents, which are also reverse scored, positive effect sizes reflect a reduction in problem behaviors).

Table 6

Correlations among end-of-year DECA scores and outcome variables in third grade

	Initiativ	Self-Regulation	Attach/ Relation	Behavior Concerns	School Perform	School SES	Days Absent	Disciplinar Incidents	EOG Math	EOG Reading	MAP Math	MAP Reading	DIBELS Fluency	DIBELS Composite	Math Grade	Science Grade
Initiative	1															
Self-Regulation	.61**	1														
Attach/Relation	.67**	.55**	1													
Behavior Concerns	-.53**	-.77**	-.42**	1												
School Perform	.04	.01	-.02	-.04*	1											
School SES	.01	.04	.00	-.03	.63**	1										
Days Absent	-.07**	-.05*	-.05*	.08**	-.17**	-.13**	1									
Disciplin Incid	-.04	-.15**	-.08**	.17**	-.15**	-.11**	.18**	1								
EOG Math	.28**	.20**	.11**	-.24**	.39**	.34**	-.21**	-.17**	1							
EOG Reading	.30**	.19**	.11**	-.24**	.42**	.39**	-.13**	-.15**	.74**	1						
MAP Math	.32**	.21**	.12**	-.26**	.40**	.36**	-.19**	-.15**	.86**	.75**	1					
MAP Reading	.32**	.20**	.14**	-.24**	.40**	.39**	-.14**	-.17**	.74**	.87**	.80**	1				
DIBELS Fluency	.26**	.14**	.10**	-.20**	.42**	.40**	-.14**	-.12**	.63**	.79**	.67**	.81**	1			
DIBELS Composite	.29**	.15**	.12**	-.21**	.44**	.43**	-.14**	-.13**	.65**	.81**	.70**	.84**	.93**	1		
Math Grade	.21**	.15**	.06**	-.20**	.47**	.42**	-.22**	-.22**	.79**	.68**	.75**	.67**	.60**	.63**	1	
Science Grade	.19**	.16**	.09**	-.19**	.32**	.29**	-.19**	-.16**	.52**	.50**	.50**	.50**	.46**	.47**	.61**	1

Note. *p<.05. **p<.01. SES=Socioeconomic Status. EOG=End of Grade. MAP=Measure of Academic Progress. DIBELS=Dynamic Indicators of Basic Early Literacy Skills. N for correlations with DECA scores = 2052-2206; N for other correlations = 9406-10217. Total *N* varies when students do not have a score for every item in a scale or for every variable. Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors on most measures (when relating Behavior Concerns with Days Absent and Disciplinary Incidents, which are also reverse scored, positive effect sizes reflect a reduction in problem behaviors).

Table 7

Correlations among end-of-year DECA scores and outcome variables in fourth grade

	Initiative	Self-Regulation	Attach/ Relation	Behavior Concerns	School Perform	School SES	Days Absent	Disciplinar Incidents	EOG Math	EOG Reading	MAP Math	MAP Reading	Math Grade	Science Grade
Initiative	1													
Self-Regulation	.60**	1												
Attach/Relation	.66**	.54**	1											
Behavior Concerns	-.53**	-.77**	-.42**	1										
School Perform	.03	.02	.00	-.05*	1									
School SES	.00	.04*	.01	-.04	.63**	1								
Days Absent	-.06**	-.06**	-.01	.09**	-.15**	-.13**	1							
Disciplin Incid	-.05*	-.14**	-.05*	.16**	-.12**	-.10**	.20**	1						
EOG Math	.25**	.17**	.09**	-.21**	.43**	.38**	-.21**	-.16**	1					
EOG Reading	.27**	.17**	.12**	-.21**	.43**	.41**	-.16**	-.14**	.75**	1				
MAP Math	.30**	.20**	.11**	-.26**	.39**	.35**	-.21**	-.15**	.86**	.77**	1			
MAP Reading	.27**	.20**	.11**	-.25**	.41**	.38**	-.16**	-.15**	.73**	.87**	.79**	1		
Math Grade	.19**	.14**	.06**	-.19**	.42**	.40**	-.22**	-.20**	.79**	.67**	.74**	.65**	1	
Science Grade	.15**	.13**	.07**	-.17**	.25**	.24**	-.16**	-.17**	.50**	.47**	.47**	.47**	.63**	1

Note. *p<.05. **p<.01. SES=Socioeconomic Status. EOG=End of Grade. MAP=Measure of Academic Progress. N for correlations with DECA scores = 2097-2224; N for other correlations = 10373-11048. Total *N* varies when students do not have a score for every item in a scale or for every variable. Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors on most measures (when relating Behavior Concerns with Days Absent and Disciplinary Incidents, which are also reverse scored, positive effect sizes reflect a reduction in problem behaviors).

Table 8

Correlations among end-of-year DECA scores and outcome variables in fifth grade

	Initiative	Self-Regulation	Attach/ Relation	Behavior Concerns	School SES	Days Absent	Disciplinary Incidents	MAP Math	MAP Reading	Math Grade	Science Grade
Initiative	1										
Self-Regulation	.61**	1									
Attach/Relation	.66**	.54**	1								
Behavior Concerns	-.53**	-.77**	-.42**	1							
School SES	.00	.04	.01	-.02	1						
Days Absent	-.05*	-.05*	-.05*	.06**	-.12**	1					
Disciplinary Incidents	-.01	-.12**	-.06**	.12**	-.09**	.17**	1				
MAP Math	.29**	.20**	.11**	-.24**	.38**	-.20**	-.15**	1			
MAP Reading	.29**	.18**	.13**	-.22**	.38**	-.14**	-.13**	.81**	1		
Math Grade	.14**	.14**	.07**	-.15**	.38**	-.22**	-.19**	.67**	.57**	1	
Science Grade	.15**	.13**	.06**	-.15**	.34**	-.18**	-.17**	.62**	.61**	.70**	1

Note. *p<.05. **p<.01. SES=Socioeconomic Status. EOG=End of Grade. MAP=Measure of Academic Progress. N for correlations with DECA scores = 2126-2244; N for other correlations = 11286-11936. Total *N* varies when students do not have a score for every item in a scale or for every variable. Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors on most measures (when relating Behavior Concerns with Days Absent and Disciplinary Incidents, which are also reverse scored, positive effect sizes reflect a reduction in problem behaviors). MAP scores for 2019-20 (Grade 5) are Winter scores as the test was not administered in the Spring. Grades in math and science for 2019-20 (Grade 5) are Q3 grades as final grades were not recorded that year.

Table 9

Linear regression results for social emotional ratings predicting number of days absent during the school year

	K			Grade 1			Grade 2			Grade 3			Grade 4			Grade 5		
	β	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2
Model: EOY DECA			.02**			.01*			.01**			.02**			.02**			.01
School Performance	-.06*	.01		-.04	.01		-.08**	.01		-.09**	.01		-.07**	.01		-	-	
School SES	.00	.01		-.03	.00		-.02	.00		.01	.00		-.02	.00		.02	.00	
Initiative	-.11**	.02		-.03	.02		-.05	.02		-.04	.02		-.07*	.02		-.02	.02	
Self-Regulation	.01	.03		.04	.02		.03	.02		.06	.02		.01	.03		.02	.02	
Attachment/Relationships	.03	.02		.01	.02		-.01	.02		-.02	.02		.07*	.02		-.02	.02	
Behavior Concerns	.04	.02		.08*	.02		.05	.02		.09*	.02		.09*	.02		.06	.02	
Model: DECA Change			.01			.00			.01**			.02**			.01*			.00
School Performance	-.05*	.01		-.03	.01		-.08**	.01		-.11**	.02		-.08**	.02		-	-	
School SES	.00	.01		-.03	.00		-.03	.00		.02	.00		-.01	.00		.02	.00	
Initiative	-.07	.04		.00	.04		.01	.04		.00	.04		-.04	.04		.00	.03	
Self-Regulation	.04	.05		.05	.04		.01	.04		.01	.04		.03	.05		.03	.04	
Attachment/Relationships	-.02	.05		-.04	.04		-.06	.04		-.07*	.04		-.01	.04		-.04	.04	
Behavior Concerns	-.01	.04		.00	.04		-.03	.04		-.03	.04		-.01	.04		.01	.03	

Note. *p<.05. **p<.01. K=Kindergarten. *β*=Standardized Beta. S.E.=Standard Error. EOY DECA=End-of-year Devereux Early Childhood Assessment scores. SES=Socioeconomic Status. School Performance Grades unavailable for 2019-20 (Grade 5). When relating Behavior Concerns and Days Absent, which are reverse scored, positive effect sizes reflect a reduction in problem behaviors. Results are for the same cohort of students across each grade.

Table 10

Linear regression results for social emotional ratings predicting total number of disciplinary incidents during the school year

	K			Grade 1			Grade 2			Grade 3			Grade 4			Grade 5		
	β	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2
Model: EOY DECA			.04**			.04**			.05**			.04**			.03**			.03**
School Performance	.03	.00		.01	.00		.01	.00		-.08**	.00		-.05	.00		-	-	
School SES	.02	.07		-.04	.07		-.02	.05		-.01	.06		.00	.06		-.03	.04	
Initiative	.07*	.01		.07*	.01		.12**	.00		.14**	.01		.10**	.01		.12**	.00	
Self-Regulation	-.06	.01		-.10**	.01		-.05	.00		-.04	.01		.01	.01		-.08*	.00	
Attachment/Relationships	.04	.01		.02	.01		.02	.00		-.02	.01		.01	.01		-.05	.00	
Behavior Concerns	.19**	.01		.16**	.01		.22**	.00		.17**	.01		.18**	.01		.11**	.00	
Model: DECA Change			.01*			.02**			.01			.01*			.01			.01
School Performance	.01	.00		-.01	.00		.00	.00		-.08**	.00		-.05*	.00		-	-	
School SES	.04	.07		-.03	.08		-.01	.05		-.01	.06		.01	.06		-.06*	.05	
Initiative	.06	.01		.07*	.01		.01	.01		.01	.01		-.02	.01		.04	.01	
Self-Regulation	-.03	.01		-.04	.01		.01	.01		-.05	.01		-.06	.01		-.02	.01	
Attachment/Relationships	-.06	.01		-.07*	.01		-.07*	.01		-.04	.01		.01	.01		-.05	.01	
Behavior Concerns	-.09**	.01		-.11**	.01		-.07*	.01		-.05	.01		-.05	.01		-.03	.01	

Note. *p<.05. **p<.01. K=Kindergarten. *β*=Standardized Beta. S.E.=Standard Error. EOY DECA=End-of-year Devereux Early Childhood Assessment scores. SES=Socioeconomic Status. School Performance Grades unavailable for 2019-20 (Grade 5). When relating Behavior Concerns and Disciplinary Incidents, which are reverse scored, positive effect sizes reflect a reduction in problem behaviors. Results are for the same cohort of students across each grade.

Table 11

Linear regression results for social emotional ratings predicting math and reading EOG scale scores

	Math						Reading					
	Grade 3			Grade 4			Grade 3			Grade 4		
	β	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2
Model: EOY DECA			.13**			.12**			.14**			.12**
School Performance	.16**	.02		.18**	.02		.15**	.02		.16**	.02	
School SES	-.02	.00		-.03	.00		.00	.00		-.02	.00	
Initiative	.31**	.03		.29**	.03		.34**	.03		.31**	.03	
Self-Regulation	-.03	.03		-.03	.03		-.07*	.03		-.08*	.03	
Attachment/Relationships	-.15**	.03		-.15**	.03		-.15**	.03		-.10**	.03	
Behavior Concerns	-.15**	.03		-.14**	.03		-.17**	.03		-.14**	.03	
Model: DECA Change			.03**			.04**			.04**			.04**
School Performance	.17**	.02		.20**	.02		.18**	.02		.19**	.02	
School SES	-.03	.00		-.03	.00		-.01	.00		-.01	.00	
Initiative	.01	.06		.03	.05		.04	.06		.06	.06	
Self-Regulation	-.02	.06		-.01	.06		-.01	.06		-.03	.06	
Attachment/Relationships	.04	.06		.03	.06		.00	.06		.03	.06	
Behavior Concerns	.01	.06		.00	.06		.00	.06		-.01	.06	

Note. *p<.05. **p<.01. EOG=End of Grade. *β*=Standardized Beta. S.E.=Standard Error. EOY DECA=End-of-year Devereux Early Childhood Assessment scores. SES=Socioeconomic Status. Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors. Results are for the same cohort of students across each grade.

Table 12

Linear regression results for social emotional ratings predicting math MAP scores

	Grade 1			Grade 2			Grade 3			Grade 4			Grade 5		
	β	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2
Model: EOY DECA			.16**			.14**			.16**			.15**			.12**
School Performance	.08**	.03		.11**	.02		.16**	.03		.14**	.03		-	-	
School SES	.00	.61		.05	.42		.01	.44		.03	.48		.10**	.47	
Initiative	.40**	.05		.35**	.03		.36**	.03		.34**	.04		.34**	.04	
Self-Regulation	-.10*	.06		-.07	.04		-.06	.04		-.07*	.05		-.05	.05	
Attachment/Relationships	-.16**	.05		-.16**	.03		-.16**	.04		-.16**	.04		-.17**	.04	
Behavior Concerns	-.21**	.05		-.17**	.04		-.18**	.04		-.20**	.04		-.17**	.05	
Model: DECA Change			.01			.03**			.03**			.03**			.01**
School Performance	.10**	.04		.16**	.02		.18**	.03		.17**	.03		-	-	
School SES	-.04	.73		.02	.49		-.02	.53		.01	.58		.09**	.56	
Initiative	.04	.10		.04	.07		.01	.08		.06	.08		.04	.08	
Self-Regulation	.01	.11		.00	.08		-.01	.08		-.04	.09		-.04	.09	
Attachment/Relationships	-.05	.11		.01	.08		.04	.08		.02	.09		.03	.09	
Behavior Concerns	-.01	.10		.02	.07		-.01	.08		.00	.09		.00	.09	

Note. *p<.05. **p<.01. MAP=Measure of Academic Progress. *β*=Standardized Beta. S.E.=Standard Error. EOY DECA=End-of-year Devereux Early Childhood Assessment scores. SES=Socioeconomic Status. MAP scores are Spring scores for grade 1 through grade 4, and Winter scores for grade 5 as the test was not administered in the Spring. School Performance Grades unavailable for 2019-20 (Grade 5). Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors. Results are for the same cohort of students across each grade.

Table 13

Linear regression results for social emotional ratings predicting reading MAP scores

	Grade 1			Grade 2			Grade 3			Grade 4			Grade 5		
	β	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2
Model: EOY DECA			.18**			.13**			.15**			.13**			.14**
School Performance	.10**	.03		.07**	.03		.14**	.03		.13**	.03		-	-	
School SES	.04	.60		.06*	.54		.05*	.52		.07**	.52		.09**	.49	
Initiative	.42**	.04		.34**	.04		.36**	.04		.30**	.04		.36**	.04	
Self-Regulation	-.09*	.05		-.06	.05		-.06	.05		-.06	.05		-.08*	.05	
Attachment/Relationships	-.14**	.05		-.12**	.04		-.13**	.04		-.14**	.04		-.13**	.04	
Behavior Concerns	-.18**	.05		-.17**	.05		-.15**	.05		-.19**	.05		-.18**	.05	
Model: DECA Change			.02**			.02**			.03**			.04**			.01**
School Performance	.11**	.04		.12**	.03		.17**	.04		.17**	.04		-	-	
School SES	.01	.73		.03	.65		.03	.62		.05*	.61		.09**	.59	
Initiative	.07	.10		.03	.09		.04	.09		.05	.09		.04	.09	
Self-Regulation	-.05	.11		.03	.10		.01	.10		-.01	.10		-.01	.10	
Attachment/Relationships	-.02	.11		.03	.10		.01	.10		.01	.10		.02	.10	
Behavior Concerns	-.01	.10		.05	.09		-.01	.09		-.01	.09		-.01	.09	

Note. *p<.05. **p<.01. MAP=Measure of Academic Progress. *β*=Standardized Beta. S.E.=Standard Error. EOY DECA=End-of-year Devereux Early Childhood Assessment scores. SES=Socioeconomic Status. MAP scores are Spring scores for grade 1 through grade 4, and Winter scores for grade 5 as the test was not administered in the Spring. School Performance Grades unavailable for 2019-20 (Grade 5). Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors. Results are for the same cohort of students across each grade.

Table 14

Linear regression results for social emotional ratings predicting DIBELS reading fluency score

	Grade 1			Grade 2			Grade 3		
	β	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2
Model: EOY DECA			.11**			.11**			.12**
School Performance	.09**	.05		.13**	.06		.14**	.08	
School SES	.08**	1.19		.07**	1.32		.06**	1.30	
Initiative	.34**	.09		.31**	.10		.30**	.10	
Self-Regulation	-.10**	.11		-.12**	.12		-.10**	.13	
Attachment/Relationships	-.13**	.09		-.09**	.10		-.10**	.10	
Behavior Concerns	-.14**	.10		-.13**	.11		-.15**	.12	
Model: DECA Change			.03**			.04**			.04**
School Performance	.11**	.06		.16**	.07		.16**	.09	
School SES	.06*	1.39		.05	1.52		.05	1.50	
Initiative	.07	.18		.07*	.20		.06	.21	
Self-Regulation	.02	.21		-.03	.23		-.03	.24	
Attachment/Relationships	-.04	.20		-.01	.22		.01	.23	
Behavior Concerns	.01	.19		.00	.21		-.01	.22	

Note. *p<.05. **p<.01. DIBELS= Dynamic Indicators of Basic Early Literacy Skills. *β*=Standardized Beta. S.E.=Standard Error. EOY DECA=End-of-year Devereux Early Childhood Assessment scores. SES=Socioeconomic Status. Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors. Results are for the same cohort of students across each grade.

Table 15

Linear regression results for social emotional ratings predicting DIBELS reading composite score

	K			Grade 1			Grade 2			Grade 3		
	β	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2
Model: EOY DECA			.09**			.11**			.13**			.15**
School Performance	.03	.07		.08**	.14		.16**	.18		.18**	.26	
School SES	.05*	1.69		.07**	3.14		.06**	3.79		.09**	4.34	
Initiative	.34**	.12		.32**	.23		.33**	.28		.33**	.34	
Self-Regulation	-.05	.15		-.11**	.29		-.13**	.35		-.11**	.42	
Attachment/Relationships	-.13**	.13		-.13**	.24		-.07*	.29		-.10**	.35	
Behavior Concerns	-.09**	.14		-.17**	.27		-.12**	.33		-.15**	.39	
Model: DECA Change			.00			.02**			.05**			.06**
School Performance	.03	.08		.10**	.16		.20**	.20		.21**	.30	
School SES	.02	1.94		.05	3.64		.05	4.38		.07**	5.01	
Initiative	.02	.26		.06	.48		.06	.58		.06	.70	
Self-Regulation	.03	.29		.01	.55		-.03	.67		.00	.80	
Attachment/Relationships	-.02	.28		-.02	.53		.01	.64		.01	.77	
Behavior Concerns	.04	.27		.00	.50		.02	.60		.00	.72	

Note. *p<.05. **p<.01. DIBELS= Dynamic Indicators of Basic Early Literacy Skills. K=Kindergarten. *β*=Standardized Beta. S.E.=Standard Error. EOY DECA= End-of-year Devereux Early Childhood Assessment scores. SES=Socioeconomic Status. Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors. Results are for the same cohort of students across each grade.

Table 16

Linear regression results for social emotional ratings predicting final grades in math and science

	Math									Science								
	Grade 3			Grade 4			Grade 5			Grade 3			Grade 4			Grade 5		
	β	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2
Model: EOY DECA			.13**			.10**			.05**			.07**			.04**			.04**
School Performance	.22**	.02		.14**	.02		-	-		.12**	.02		.03	.02		-	-	
School SES	.08**	.35		.07**	.35		.13**	.40		.04	.29		.01	.31		.11**	.35	
Initiative	.23**	.03		.21**	.03		.13**	.03		.19**	.02		.13**	.02		.15**	.03	
Self-Regulation	-.03	.03		-.06	.04		.00	.04		.00	.03		-.03	.03		.00	.04	
Attachment/Relationships	-.13**	.03		-.12**	.03		-.07*	.04		-.08**	.02		-.06	.03		-.08**	.03	
Behavior Concerns	-.14**	.03		-.18**	.03		-.11**	.04		-.11**	.03		-.15**	.03		-.10**	.03	
Model: DECA Change			.07**			.04**			.02**			.02**			.00			.01*
School Performance	.23**	.02		.18**	.02		-	-		.14**	.02		.05	.02		-	-	
School SES	.06*	.40		.06*	.40		.12**	.45		.04	.33		.00	.35		.10**	.40	
Initiative	-.01	.06		.03	.06		-.05	.07		.03	.05		-.01	.05		-.01	.06	
Self-Regulation	.03	.06		-.01	.07		-.01	.08		-.02	.05		.03	.06		.00	.07	
Attachment/Relationships	.04	.06		.02	.06		.04	.08		.00	.05		.01	.06		.02	.07	
Behavior Concerns	.01	.06		-.01	.06		-.01	.07		.01	.05		.02	.05		.00	.06	

Note. *p<.05. **p<.01. *β*=Standardized Beta. S.E.=Standard Error. EOY DECA=End-of-year Devereux Early Childhood Assessment scores. SES=Socioeconomic Status. School Performance Grades unavailable for 2019-20 (Grade 5). Grades in math and science for 2019-20 (Grade 5) are Q3 grades as final grades were not recorded that year. Behavior Concerns is reverse scored, positive effect sizes reflect a greater reduction in problem behaviors. Results are for the same cohort of students across each grade.

Table 17

Correlations among DECA (end-of-year and change) scores in pre-k and average Panorama scores in sixth grade

	End-of-Year DECA Scores				DECA Change Scores			
Panorama Scores	Initiative	Self-Regulation	Attachment & Relationships	Behavior Concerns	Initiative	Self-Regulation	Attachment & Relationships	Behavior Concerns
Challenging Feelings	.01	.01	-.05	.01	.00	-.02	-.06*	.06*
Emotion Regulation	.00	.05	-.04	-.04	-.01	-.01	-.01	.02
Growth Mindset	.03	.02	.03	.00	-.02	.00	.03	.02
Positive Feelings	-.01	.00	-.01	.00	-.06*	-.02	-.03	.02
Social Awareness	.05	.07**	.06*	-.07**	-.02	.03	.03	-.02
Self-Efficacy	.04	.03	.02	-.03	-.02	-.02	-.04	.00
Supportive Relationships	-.02	.03	-.01	-.03	-.08**	-.04	-.01	.05
Cultural Awareness and Action	-.03	.00	-.01	-.01	-.03	-.01	.02	-.02
Sense of Belonging	-.02	.05	.01	-.04	-.02	.02	.02	-.02
Teacher-Student Relationships	.01	.04	.02	-.04	-.04	-.02	.01	-.02

Note. *p<.05. **p<.01. N=1136-1458. EOY DECA=End-of-year Devereux Early Childhood Assessment scores. Behavior Concerns is reverse scored, negative effect sizes reflect a greater reduction in problem behaviors. Results are for the same cohort of students in pre-k and in sixth grade.

Table 18

Total number of students receiving each combination of social emotional programs through fifth grade

	Total Number of Students	Percent of Students
No program	2168	18.2
RULER only	2177	18.2
CSC only	3908	32.7
Prek only	470	3.9
RULER + CSC	1355	11.4
RULER + Prek	634	5.3
CSC + Prek	830	7.0
RULER + CSC + Prek	394	3.3

Note. N=11936. CSC=Caring School Curriculum.

Table 19

Correlations among each combination of social emotional programs received and outcome variables in fifth grade

	School SES	Days Absent	Disciplinary Incidents	MAP Math	MAP Reading	Math Grade	Science Grade
No program	.13**	-.01	.02*	.09**	.10**	.06**	.07**
RULER only	-.10**	.04**	.03**	-.07**	-.07**	-.10**	-.07**
CSC only	.23**	-.04**	-.05**	.11**	.10**	.16**	.13**
Prek only	-.04**	-.01	.02*	-.02*	-.02*	-.03**	-.02*
RULER + CSC	-.10**	.06**	.02	-.07**	-.06**	-.06**	-.06**
RULER + Prek	-.15**	.00	.00	-.06**	-.06**	-.07**	-.07**
CSC + Prek	-.08**	-.03**	.00	-.04**	-.04**	-.03**	-.03**
RULER + CSC + Prek	-.12**	-.01	-.01	-.06**	-.05**	-.05**	-.06**

Note. *p<.05. **p<.01. N= 11286-11936. SES=Socioeconomic Status. MAP=Measure of Academic Progress. CSC=Caring School Community. Total *N* varies when students do not have a score for every item in a scale or for every variable. MAP scores for 2019-20 (Grade 5) are Winter scores as the test was not administered in the Spring. Grades in math and science for 2019-20 (Grade 5) are Q3 grades as final grades were not recorded that year.

Table 20

Linear regression results for combination of social emotional programs predicting student academic and behavioral outcomes in fifth grade

	N Days Absent			N Disciplinary Incidents			MAP Math Score			MAP Reading Score			Math Grade			Science Grade		
	β	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2	*β*	S.E.	R^2
Model 1			.01**			.01**			.15**			.15**			.14**			.12**
School SES	-.12**	.07		-.10**	.02		.38**	.18		.37**	.19		.37**	.13		.34**	.12	
No program	.00	.14		.03**	.04		.04**	.40		.05**	.40		.02	.30		.03**	.26	
Model 2			.01**			.01**			.14**			.14**			.14**			.12**
School SES	-.11**	.07		-.09**	.02		.38**	.18		.38**	.19		.37**	.13		.34**	.12	
RULER only	.02*	.14		.02*	.04		-.03**	.38		-.03**	.38		-.06**	.28		-.04**	.24	
Model 3			.01**			.01**			.14**			.14**			.15**			.12**
School SES	-.11**	.07		-.09**	.02		.37**	.19		.38**	.19		.36**	.14		.33**	.12	
CSC only	-.01	.12		-.04**	.03		.03**	.32		.01	.32		.07**	.23		.05**	.21	
Model 4			.01**			.01**			.14**			.14**			.14**			.12**
School SES	-.12**	.07		-.09**	.02		.38**	.18		.38**	.19		.37**	.13		.34**	.12	
Prek only	-.02*	.29		.02	.08		.00	.80		-.01	.80		-.01	.58		-.01	.51	
Model 5			.02**			.01**			.14**			.14**			.14**			.12**
School SES	-.11**	.07		-.09**	.02		.38**	.18		.38**	.19		.37**	.13		.34**	.12	
RULER + CSC	.05**	.17		.01	.04		-.04**	.46		-.03**	.47		-.03**	.34		-.03**	.30	
Model 6			.01**			.01**			.14**			.14**			.14**			.12**
School SES	-.12**	.07		-.09**	.02		.38**	.18		.38**	.19		.37**	.14**		.34**	.12	
RULER + Prek	-.01	.24		-.01	.06		.00	.65		.00	.66		-.01	.47		-.02	.42	
Model 7			.01**			.01**			.14**			.14**			.14**			.12**
School SES	-.12**	.07		-.09**	.02		.38**	.18		.38**	.19		.38**	.13		.34**	.12	
CSC + Prek	-.04**	.21		-.01	.06		-.01	.58		-.01	.58		.00	.42		-.01	.37	
Model 8			.01**			.01**			.14**			.14**			.14**			.12**
School SES	-.12**	.07		-.10**	.02		.38**	.18		.38**	.19		.38**	.13		.34**	.12	
RULER + CSC + Prek	-.02*	.30		-.02*	.08		-.01	.83		.00	.84		.00	.60		-.02*	.54	

Note. *p<.05. **p<.01. SES=Socioeconomic Status. MAP=Measure of Academic Progress. CSC=Caring School Community. *β*=Standardized Beta. S.E.=Standard Error. MAP scores are Winter scores for as the test was not administered in the Spring. Grades in math and science are Q3 grades as final grades were not recorded that year.

Table 21

Count of the number of years students received RULER and Caring School Curriculum through fifth grade

	RULER		Caring School Curriculum	
Number of Years	Total Number of Students	Percent of Students	Total Number of Students	Percent of Students
0	7286	61.0	5286	44.3
1	737	6.2	423	3.5
2	3913	32.8	6227	52.2

Note. N=11936.

REFERENCES

Achenbach, T. M. (2006). As others see us: Clinical and research implications of cross-informant correlations for psychopathology. *Current Directions in Psychological Science*, *15*(2), 94–98. https://doi.org/10.1111/j.0963-7214.2006.00414.x

Bailey, C. S., Rivers, S. E., Tominey, S. L., O'Bryon, E. C., Olsen, S. G., Sneeden, C. K., Peisch, V. D., Gal, D. E., & Brackett, M. A. (2019). *Promoting early childhood social and emotional learning with Preschool RULER.* Manuscript under revision.

Barnett, W. (1993). Benefit-cost analysis of preschool education: Findings from a 25-year follow-up. *American Journal of Orthopsychiatry*, *63*(4), 500–508. Retrieved from http://search.proquest.com/docview/57381355/

Battistich, V. (2003). Effects of a school-based program to enhance prosocial development on children's peer relations and social adjustment. *Journal of Research in Character Education, 1*(1), 1–17.

Battistich, V., Schaps, E., Watson, M., Solomon, D., & Lewis, C. (2000). Effects of the Child Development Project on students' drug use and other problem behaviors. *The Journal of Primary Prevention*, *21*(1), 75–99. https://doi.org/10.1023/A:1007057414994

Battistich, V., Schaps, E., & Wilson, N. (2003). Effects of an elementary school intervention on students' "connectedness" to school and social adjustment during middle school. *The Journal of Primary Prevention*, *24*(3), 243–262. https://doi.org/10.1023/b:jopp.0000018048.38517.cd

Benson, P. L. (2006). *All kids are our kids: What communities must do to raise caring and responsible children and adolescents* (2nd ed). San Francisco: Jossey-Bass.

Bierman, K.L., Coie, J.D., Dodge, K.A., Greenberg, M.T., Lochman, J.E., McMahon, R.J., & Pinderhughes, E. (2010). The effects of a multiyear universal social–emotional learning program: The role of student and school characteristics. *Journal of Consulting and Clinical Psychology*, *78*(2), 156-168. doi:10.1037/a0018607.

Blair, C., & Razza, R. (2007). Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development*, *78*(2), 647–663. https://doi.org/10.1111/j.1467-8624.2007.01019.x

Blanden, D. (2016). Universal pre-school education: The case of public funding with private provision. *The Economic Journal*, *126*(592), 682–723. https://doi.org/10.1111/ecoj.12374

Brackett, M. A., Patti, J., Stern, R., Rivers, S. E., Elbertson, N. A., Chisholm, C., & Salovey, P. (2009). A sustainable, skill-based approach to building emotionally literate schools. In M. Hughes, H. L. Thompson, & J. B. Terrell (Eds.), *Handbook for developing emotional and social intelligence: Best practices, case studies, and strategies* (pp. 329−358). San Francisco, CA: Pfeiffer

Brackett, M. A., Rivers, S. E., Choe, J., & Adams, D. (2009). *Evaluation of the emotional literacy in the middle school programme at New Line Learning Federation: Teacher self-reports of use & perceptions of impact*. (Report submitted to New Line Learning Federation, Senior Management Team). Maidstone, Kent, England: Authors.

Brackett, M., Rivers, S., Reyes, M., & Salovey, P. (2012). Enhancing academic performance and social and emotional competence with the RULER feeling words curriculum. *Learning and Individual Differences*, *22*(2), 218–224. https://doi.org/10.1016/j.lindif.2010.10.002

Bulotsky-Shearer, R., Fernandez, V., & Rainelli, S. (2013). The validity of the Devereux Early Childhood Assessment for culturally and linguistically diverse Head Start children. *Early Childhood Research Quarterly*, *28*(4), 794–807. https://doi.org/10.1016/j.ecresq.2013.07.009

Campbell, F., Ramey, C., Pungello, E., Sparling, J., & Miller-Johnson, S. (2002). Early childhood education: Young adult outcomes from the Abecedarian Project. *Applied Developmental Science*, *6*(1), 42–57. https://doi.org/10.1207/S1532480XADS0601_05

Center for the Collaborative Classroom (2018). *Caring School Community, Second Edition*. Retrieved from https://www.collaborativeclassroom.org/wp-content/uploads/2017/10/MKT2494-CSC2-Program-Preview_web.pdf

Chu, E., & Ready, D. (2018). Exclusion and urban public high schools: Short- and long-term consequences of school suspensions. *American Journal of Education*, *124*(4), 479–509. https://doi.org/10.1086/698454

Claessens, A., Duncan, G., & Engel, M. (2009). Kindergarten skills and fifth-grade achievement: Evidence from the ECLS-K. *Economics of Education Review*, *28*(4), 415–427. https://doi.org/10.1016/j.econedurev.2008.09.003

Collaborative for Academic, Social, and Emotional Learning. (n.d.). *Caring School Community*. Retrieved from https://casel.org/guideprogramscaring-school-community/

Collaborative for Academic, Social, and Emotional Learning. (2013). *2013 CASEL guide: Effective social and emotional learning programs - preschool and elementary school edition*. Retrieved from http://casel.org/wp-content/uploads/2016/01/2013-casel-guide-1.pdf

Crane, J., Mincic, M., & Winsler, A. (2011). Parent-teacher agreement and reliability on the Devereux Early Childhood Assessment (DECA) in English and Spanish for ethnically diverse children living in poverty. *Early Education and Development*, *22*(3), 520–547. Retrieved from http://search.proquest.com/docview/881469023/

Drachman, D. (2012). Adjusting for multiple comparisons. *Journal of Clinical Research Best Practices, 8*(7), 1-3.

Duncan, G. & Magnuson, K. (2011). The nature and impact of early achievement skills, attention skills, and behavior problems. In G. J. Duncan & R. J. Murnane (Eds.), *Whither Opportunity?: Rising Inequality, Schools, and Children's Life Chances* (47–69). New York: Russell Sage Foundation and Spencer Foundation.

Durlak, J.A. & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology, 41*(3-4), 327–350. https://doi.org/10.1007/s10464-008-9165-0

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

Dynamic Measurement Group, Inc. (2016). *DIBELS® Next Benchmark Goals and Composite Score*. Retrieved from https://www.caldwellschools.com/cms/lib/NC01811136/Centricity/Domain/3349/DIBELSNextBenchmarkGoals.pdf

Elliott, S. N., Huai, N., & Roach, A. T. (2007). Universal and early screening for educational difficulties: Current and future approaches. *Journal of School Psychology*, *45*(2), 137–161. https://doi.org/10.1016/j.jsp.2006.11.002

Feise, R. J. (2002). Do multiple outcome measures require *p* value adjustment? *BMC Medical Research Methodology*, *2*(1), 8–8. https://doi.org/10.1186/1471-2288-2-8

Fien, H., Park, Y., Baker, S. K., Mercier Smith, J. L., Stoolmiller, M., & Kame'enui, E. J. (2010). An examination of the relation of nonsense word fluency initial status and gains to reading outcomes for beginning readers. *School Psychology Review*, *39*(4), 631–653. https://doi.org/10.1080/02796015.2010.12087747

Gawrilow, C., Fäsche, A., Guderjahn, L., Gunzenhauser, C., Merkt, J., & Suchodoletz, A. (2014). The impact of self-regulation on preschool mathematical achievement. *Child Indicators Research*, *7*(4), 805–820. https://doi.org/10.1007/s12187-013-9201-y

Goffreda, C. T., & DiPerna, C. J. (2010). An empirical review of psychometric evidence for the Dynamic Indicators of Basic Early Literacy Skills. *School Psychology Review*, *39*(3), 463–483. https://doi.org/10.1080/02796015.2010.12087766

Good, R. H. & Kaminski, R. A. (Eds.). (2002). *Dynamic Indicators of Basic Early Literacy Skills* (6th ed.). Eugene, OR: Institute for the Development of Educational Achievement.

Gormley, W., & Gayer, T. (2005). Promoting school readiness in Oklahoma: An evaluation of Tulsa's pre-K program. *Journal of Human Resources, 40,* 533–558. Retrieved from http://www.jstor.org.librarylink.uncc.edu/stable/4129551

Gormley Jr., W., Phillips, D., Newmark, K., Welti, K., & Adelstein, S. (2011). Social-emotional effects of early childhood education programs in Tulsa. *Child Development, 82*(6), 2095–2109. https://doi.org/10.1111/j.1467-8624.2011.01648.x

Gottfried, M. A. (2010). Evaluating the relationship between student attendance and achievement in urban elementary and middle schools: An instrumental variables approach. *American Educational Research Journal, 47*(2), 434–465. https://doi.org/10.3102/0002831209350494

Gottfried, M. A. (2017). Does truancy beget truancy? Evidence from elementary school. *The Elementary School Journal, 118*(1), 128–148. https://doi.org/10.1086/692938.

Hagelskamp, C., Brackett, M., Rivers, S., & Salovey, P. (2013). Improving classroom quality with the RULER approach to social and emotional learning: Proximal and distal outcomes. *American Journal of Community Psychology, 51*(3), 530–543. https://doi.org/10.1007/s10464-013-9570-x

Hawkins, J. D., Kosterman, R., Catalano, R. F., Hill, K. G., & Abbott, R. D. (2008). Effects of social development intervention in childhood 15 years later. *Archives of Pediatrics and Adolescent Medicine, 162*(12), 1133– 1141. https://doi.org/10.1001/archpedi.162.12.1133

Heckman, J. J., Pinto, R., & Savelyev, P. (2013). Understanding the mechanisms through which an influential early childhood program boosted adult outcomes. *American Economic Review, 103*(6), 2052–86. https://doi.org/10.1257/aer.103.6.2052

Hoffmann, J., Brackett, M., Bailey, C., & Willner, C. (2020). Teaching emotion regulation in schools: Translating research into practice with the RULER approach to social and emotional learning. *Emotion*, *20*(1), 105–109. https://doi.org/10.1037/emo0000649

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. https://doi.org/10.2105/AJPH.2015.302630

LeBuffe, P.A. & Naglieri, J.A. (2012). *Devereux early childhood assessment for preschoolers* (2nd ed.). Lewisville, NC: Kaplan Early Learning Company.

Li-Grining, C., Votruba-Drzal, E., Maldonado-Carreno, C., & Haas, K. (2010). Children's early approaches to learning and academic trajectories through fifth grade. *Developmental Psychology*, *46*(5), 1062–1077. https://doi.org/10.1037/a0020066

Magnuson, K., Meyers, M., Ruhm, C., & Waldfogel, J. (2004). Inequality in preschool education and school readiness. *American Educational Research Journal*, *41*, 115–157. https://doi.org/10.3102/00028312041001115

Magnuson, K., Ruhm, C., & Waldfogel, J. (2007). Does prekindergarten improve school preparation and performance? *Economics of Education Review*, *26*(1), 33–51. https://doi.org/10.1016/j.econedurev.2005.09.008

Marshall, J. C. & Caldwell, S. D. (2007). *Caring School Community Implementation Study: Four year evaluation report*. St. Louis, MO: Marshall Consulting.

Maurer, M., & Brackett, M. A. (2004). *Emotional literacy in the middle school: A 6-step program to promote social, emotional, & academic learning*. Port Chester, NY: National Professional Resources.

McClelland, M., Cameron, C., Connor, C., Farris, C., Jewkes, A., & Morrison, F. (2007). Links between behavioral regulation and preschoolers' literacy, vocabulary, and math skills. *Developmental Psychology, 43*(4), 947–959. https://doi.org/10.1037/0012-1649.43.4.947

National Center for Mental Health Promotion and Youth Violence Prevention. (2012). The importance of disaggregating student data. *Safe Schools Healthy Students National Center Brief.* http://www.educationnewyork.com/files/The%20importance%20of%20disaggregating_0.pdf

North Carolina Department of Public Instruction. (n.d.). *Accountability data sets and reports.* Retrieved from https://www.dpi.nc.gov/districts-schools/testing-and-school-accountability/school-accountability-and-reporting/accountability-data-sets-and-reports

Northwest Evaluation Association. (2011). *Technical manual: For Measures of Academic Progress (MAP) and Measures of Academic Progress for Primary Grades (MPG)*.

Panorama Education. (n.d.). *Panorama Social emotional Learning Survey*. Retrieved from https://www.panoramaed.com/social emotional-learning-sel

Panorama Education. (2020). *Reliability and validity of Panorama's survey topics for students: 2020 update*. Retrieved from https://go.panoramaed.com/hubfs/Validity-Report-Student-Topics-2020.pdf

Ponitz, C., McClelland, M., Matthews, J., & Morrison, F. (2009). A structured observation of behavioral self-regulation and its contribution to kindergarten outcomes. *Developmental Psychology, 45*(3), 605–619. https://doi.org/10.1037/a0015365

Ranganathan, P., Pramesh, C., & Buyse, M. (2016). Common pitfalls in statistical analysis: The perils of multiple testing. *Perspectives in Clinical Research, 7*(2), 106–107. https://doi.org/10.4103/2229-3485.179436

Reyes, M., Brackett, M., Rivers, S., Elbertson, N., & Salovey, P. (2012). The interaction effects of program training, dosage, and implementation quality on targeted student outcomes for the RULER approach to social and emotional learning. *School Psychology Review, 41*(1), 82–99. https://doi.org/10.1080/02796015.2012.12087377

Rivers, S., & Brackett, M. (2010). Achieving standards in the English language arts (and more) using the RULER approach to social and emotional learning. *Reading & Writing Quarterly, 27*(1), 75–100. https://doi.org/10.1080/10573569.2011.532715

Roberson, I. (2006). *Evaluation Report: Caring School Communities 2003–2004*. San Francisco, CA: San Francisco Unified School District, Program Evaluation & Research Department, 2006.

Sharpe, R. V. (2019). Disaggregating data by race allows for more accurate research. *Nature Human Behaviour, 3*(12), 1240–1240. https://doi.org/10.1038/s41562-019-0696-1

Shukla, K., Konold, T., & Cornell, D. (2016). Profiles of student perceptions of school climate: Relations with risk behaviors and academic outcomes. *American Journal of Community Psychology, 57*(3-4), 291–307. https://doi.org/10.1002/ajcp.12044

Taylor, R., Oberle, E., Durlak, J., & Weissberg, R. (2017). Promoting positive youth development through school-based social and emotional learning interventions: A meta-analysis of follow-up effects. *Child Development*, *88*(4), 1156–1171. https://doi.org/10.1111/cdev.12864

The Charlotte-Mecklenburg Opportunity Task Force. (2017). *The Charlotte-Mecklenburg Opportunity Task Force Report*. Retrieved from https://s3.amazonaws.com/static.leadingonopportunity.org/downloads/LeadingOnOpportunity_Report-Compressed.pdf

von Suchodoletz, A., Trommsdorff, G., Heikamp, T., Wieber, F., & Gollwitzer, P. (2009). Transition to school: The role of kindergarten children's behavior regulation. *Learning and Individual Differences*, *19*(4), 561–566. https://doi.org/10.1016/j.lindif.2009.07.006

Weiland, C., & Yoshikawa, H. (2013). Impacts of a prekindergarten program on children's mathematics, language, literacy, executive function, and emotional skills. *Child Development*, *84*(6), 2112–2130. https://doi.org/10.1111/cdev.12099

Yates, T., Ostrosky, M.M, Cheatham, G.A., Fettig, A., Shaffer, L., & Milagros Santos, R. (2008) *Research synthesis on screening and assessing social emotional competence.* The Center on the Social and Emotional Foundations for Early Learning. Retrieved from http://csefel.vanderbilt.edu/documents/rs_screening_assessment.pdf

Xiang, Z., & Schweinhart, L. (2002, January). *Effects five years later: The Michigan School Readiness Program evaluation through age 10.* Paper prepared for the Michigan State Board of Education. Ypsilanti, MI: High/Scope Educational Research Foundation.

Yoshikawa, H., Weiland, C., Brooks-Gunn, J., Burchinal, M., Espinosa, L., Gormley, W., Ludwig, J.O., Magnuson, K.A., Phillips, D.A., & Zaslow, M.J. (2013). *Investing in our future: The evidence base on preschool education.* New York: Foundation for Child Development and Ann Arbor, MI: Society for Research in Child Development.