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Teacher Effectiveness in Improving Both Academic Achievement and Social-Emotional Skills

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Author
Lin, Yuting

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Teacher Effectiveness in Improving Both Academic Achievement and
Social-Emotional Skills

A Thesis submitted in partial satisfaction
of the requirements for the degree of

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in

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by

Yuting Lin

June 2016

Thesis Committee:
        Dr. Gregory J. Palardy, Chairperson
        Dr. Lee Swanson
        Dr. Cassandra Marie Guarino

The Thesis of Yuting Lin is approved:

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                                          Committee Chairperson

University of California, Riverside

ABSTRACT OF THE THESIS

Teacher Effectiveness in Improving Both Academic Achievement and
Social-Emotional Skills

by

Yuting Lin

Master of Arts, Graduate Program in Education
University of California, Riverside, June 2016
Dr. Gregory J. Palardy, Chairperson

This study examines associations between teacher effectiveness in improving both students' academic achievement and social-emotional skills. Using hierarchical linear modeling, a specific set of teacher practices were used to examine teacher effectiveness in both domains. Our results show that the average academic achievement residuals do not correlate with the average social-emotional residuals. However, some teaching characteristics—including teacher expectation, teacher-student relationship, and classroom discipline—significantly related to both academic achievement gains and social-emotional skill development, while some other practices significantly associated with only one domain. These findings suggest that even though there is no necessary association between teacher effectiveness in improving academic achievement along with social-emotional skills in general, teachers' instructional and social-emotional practices can make differences in students' academic and social-emotional development.

Keyword: social-emotional skills, academic achievement, effectiveness

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Introduction

Educational success is critical in a modern industrial economy. Cognitive skills, such as degree attainment and academic test scores, are often assessed as indicators of educational success because they are widely known to predict intelligence, capacity, and adult status. However, non-cognitive skills—such as social and emotional competence—are vital not only to students' individual development (Peterson & Seligman, 2004; Zins, Weissberg, Wang, & Walberg, 2004), but also to educational attainment and effectiveness (Heckman & Kautz, 2013). In recent decades, there is a growing body of research highlights the importance of non-cognitive skills—such as social-emotional skills—as determinants of students' development and teaching effectiveness (Carneiro, Crawford, & Goodman, 2007).

The number of studies documenting the importance of social-emotional skills for a range of students' outcomes at early ages has grown substantially in recent years (Zins, Weissberg, Wang, & Walberg, 2004). At the early ages, students typically do not learn alone but rather spend most of their school time in the same classroom and with the same teachers. Even preschoolers learn knowledge in collaboration with teachers and peers, as well as utilize their emotions to facilitate their learning process (Denham et al., 2012). Therefore, learning how to interact with teachers and peers properly, and learning how to regulate their emotion and motivation affect students' school lives in important ways.

Given these concerns, it is important to provide students with the social-emotional skills to effectively participate in their education and actively promote motivation to academic engagements (Blum & Libbey, 2004). A vast array of studies suggests that

emotions can either facilitate or impede students' academic engagement, motivation, and achievement (Mega, Ronconi, & De Beni, 2014; Brackett, Rivers, Reyes, & Salovey, 2012; Valiente, Swanson, & Eisenberg, 2012). On the one hand, skilled social-emotional behavior and positive interactions with peers and teachers are critical to achieving academic success during early childhood (e.g., Catalano et al., 2003). Mega, Ronconi, and De Beni (2014) demonstrate that students' emotions influence their self-regulated learning and their motivation, and these, in turn, affect academic achievement. According to Denham et al. (2012) the key social-emotional skills, including proper expression and regulation of emotions, involvement in the social milieu, and prosocial interactions with peers, are important to students' academic achievement. Students who are able to maintain a positive emotional tone are also positively engaged with classroom tasks.

On the other hand, a lack of social-emotional skills impedes students' academic achievement in a different way. Since the late 1960s, researchers have found that students who misbehave in the classroom—such as anxiety, anger, and inattention—demonstrated lower academic achievement after controlling for intelligence (e.g., Swift & Spivack, 1969). This finding has been supported by numerous recent similar studies. For instance, Denham et al. (2012) report that the students who have difficulties controlling negative emotions are not able to focus on learning and experience negative impacts in their academic success. These empirical studies imply that children must be taught in ways that motivate, engage, and involve them in their learning so that they enjoy learning and develop a stake in achievement. Accomplishing this practice requires teachers to focus on both social and emotional competence and cognitive competence.

In that sense, the association between students' social-emotional skills and their academic success is mediated by teachers' practices. In the literature, there is a growing recognition that teachers make a crucial contribution to the social and emotional development of their students that has a lasting influence on their long-term academic achievement (Murray & Greenberg, 2000; Pianta, Hamre, & Stuhlman, 2003). Teachers influence their students not only by how and what they teach, but also in how they cooperate social-emotional constructs with teaching. A meta-analysis of Durlak et al. (2011) evaluated 213 school-based, universal social and emotional learning (SEL) programs spanning kindergarten through high school. Among four formats of SEL intervention, the classroom-based intervention administered by regular classroom teachers yields more significant effect on improving students' prosocial behavior and academic performance than other similar interventions administered by non-school personnel. Consistent study results suggest that teachers play an important role in improving students' social and emotional skills, attitudes, prosocial behaviors, and academic performance (Durlak et al 2011). These studies support that teachers should effectively raise healthy children by fostering not only their cognitive development, but also their social-emotional development.

However, currently, teachers and schools are typically evaluated only in terms of their students' achievement rather than social and emotional skills. A vast body of studies indicates that schools have faced mounting pressure to pay more attention to academic success so that less attention has been focused on social and emotional competence and how the content is taught (Blum & Libbey, 2004). During the last three decades, teaching

quality, in terms of improving students' academic success particularly for early education, has received considerable attention from educational researchers, policymakers, and the public. From the late 1970s, researchers have been pursuing a teacher effectiveness paradigm that can consistently identify teachers who produce more achievement gains than other teachers (Stallings & Kaskowitz, 1974). Researchers tend to focus on evaluating teachers' attitudes, classroom management, and instruction behaviors to investigate their impacts on students' achievement gains. For example, in Good's (1979) meta-analysis, teachers' classroom managerial abilities and direct instruction to different levels of students have been found to relate positively to students' achievement. Teachers who outperformed other teachers in terms of classroom managerial abilities and direct instruction tended to produce more achievements gains (Good's, 1979).

While curricula content of the education mainstream has been narrowed to accentuate academic success, a broader understanding of what constitutes teacher quality or school success is needed. The overemphasis on student achievement leads to ignoring students' social-emotional competence, which may have long-term effects in a number of areas on students' adult lives. For instance, a meta-analysis of social and emotional competence and work performance (Joseph & Newman, 2010) reported a positive association between higher social and emotional skills and better performance in work across 19 samples. Another recent study investigated bullying problems in childhood (Wolke, Copeland, Angold, & Costello, 2013): A large cohort of children was assessed for bullying involvement in childhood and then followed up in young adulthood to assess health, wealth, social relationships, and anti-social behavior. Victims of childhood

bullying were at increased risk of poor health, wealth, and social relationship outcomes in adulthood. Although currently teachers and schools are typically evaluated only in terms of their students' achievement, these recent studies demonstrate that social and emotional skills are as or more predictive of an array of life outcomes including high school graduation, college enrollment, career, and health.

In order to address the gap between students' academic achievement and social and emotional skills, the current study uses hierarchical linear modeling to examine teaching effectiveness in terms of improving students' academic achievements and social-emotional skills in second grade. Teachers' instructional practices are also examined to identify the most prominent predictors of both students' academic gains and social and emotional competencies.

Literature Review

Similar to cognitive skills, non-cognitive skills—such as self-confidence, self-control, and interpersonal skills—of young children are unstable and easily shaped by teachers' behaviors (Eisenberg, Spinrad, & Eggum, 2010; Johnson, 2012). Based on a sample of students of grade 3-5, Skinner and Belmont (1993) found effects of teachers' behaviors and attitudes on students' non-cognitive behaviors. Their results indicate that students who behaved negatively received negative teacher responses, which further undermined students' motivation, self-esteem, and self-regulation skills. This finding implies that rather than reprimanding students' misbehaviors, a well-informed teacher needs to find solutions to help the students regulate their emotions and behaviors.

To fulfill this need, teachers should be trained to understand how emotion control develops and how to support its development. Jennings and Greenberg (2009) argue that socially and emotionally competent teachers are reported to have high social awareness and to understand how to manage their emotions, behavior, and relationships with students. Their results also suggest that teachers with higher social-emotional competence have healthier teacher-student relationships and implement social and emotional curriculum more effectively, both of which help create a healthy classroom climate and improve students' social-emotional and academic outcomes.

In addition to studies documenting the need for these teaching skills, a variety of training programs aims at training teachers to be social-emotional competent, so that are able to encourage their students' prosocial behavior and interpersonal skills at early ages (Frey et al., 2000; Battistich et al., 1997). Programs such as PATHS (Promoting Alternative Thinking Strategies), Caring School Community (CSC), and Second Step have targeted elementary students and the promotion of prosocial behaviors to prevent behavior problems and reduce violence (Frey et al., 2000). To be more specific, the PATHS and CSC offer methods for improving classroom climate and students' social-emotional skills. They both involve extensive process-based activities that teachers apply to everyday situations to increase student self-control and on-task behaviors while reducing aggression and increasing prosocial behaviors among first graders (CPPRG, 1999). For example, Battistich et al. (1997) examined the effects of the CSC program in a longitudinal study of 24 elementary schools in six school districts. Two schools from each district were assigned to experimental groups, while the other two were assigned to

control groups. Their results showed that teachers who received CSC training were more supportive, had more emphasis on prosocial values, and encouraged more expression of emotions and ideas compared with those of the control group teachers. Among CSC classrooms, an increase in these practices resulted in improvements in students' self-reported academic engagement, positive interpersonal behavior, conflict resolution skills, and sense of efficacy and altruistic behavior (Battistich et al., 1997).

Second Step is another curriculum-based intervention created with the dual goals of reducing the occurrence of social, emotional, and behavioral problems and enhancing positive interactions (Frey et al., 2000). At the beginning of the intervention, teachers participated in a workshop that trains teachers with effective instructional strategies, including group discussion and role plays, to facilitate student learning in classroom activities. During the intervention, teachers provided students social-emotional tasks that focused on empathy, problem solving, and emotion management. As a result, students in Second Step classrooms significantly decreased their physically aggressive behaviors while increasing their prosocial and neutral interactions for the six-month period of intervention; control students showed an increase in physically aggressive behaviors and no change in prosocial behavior during the same period (Grossman et al., 1997).

However, these social and emotional training programs, which are consistently effective in improving children' social and emotional skills, are rarely a requirement of teacher training in the current education system, even despite their well-documented outcomes in improving children's social and emotional skills (Jennings & Greenberg, 2009). Another more recent school effectiveness study aims to identify the practices used

by schools that successfully improved student achievement (Rutledge, Cohen-Vogel, & Roberts, 2015). Two higher performing schools in the study report having strong and deliberate practices and programs that improve both students' academic and social learning needs. These findings imply that balancing academic and social learning among students is of critical importance in the current education system, as it may be a more effective approach to improve student achievement in their later lives than emphasizing academic gains solely.

In this study, I hypothesize that teacher effectiveness in improving both academic achievement and social-emotional skills is critical in improving teacher quality. We further hypothesize that teachers need to understand the development of their students' academic and social-emotional learning, to develop effective and caring classroom management, and to better understand the relations between emotion, cognition, and behavior. To develop these competencies, specific teaching characteristics and practices are required on the daily classroom instruction. From classroom climate and teacher practices perspectives, the following paragraph will continue to argue that there is a list of teacher-related factors that contribute to students' academic achievement and social-emotional competence.

Classroom Climate

The field of child development holds that the needs of children must be addressed by creating positive environments or settings that encourage their achievement, problem-solving, and engagement (Catalano et al., 2003). Specific emotional, interpersonal, and organizational aspects of the school lives of students are associated in important ways

with the quality and character of the educational practices their teachers utilize during the early ages (Roeser, Eccles, and Sameroff, 2000). It is clear that a student's daily learning context at early ages is largely shaped by teachers who set the tone of the classroom by developing healthy relationships with their students, managing student classroom behaviors, and coaching students through conflict situations. Practicing these skills consistently will build up a healthy classroom climate that has low levels of misbehavior, appropriate expressions of emotion, strong interest and focus on academic tasks, and supportiveness of students' individual differences and needs (La Paro & Pianta, 2003).

Teacher-Student Relationships

There is widespread agreement among education researchers that relationship management is a core social-emotional skill of teachers that has important effects on students' early development across a wide range of domains, including social behaviors and academic achievement (Pianta & Howes, 2002; Maldonado-Carreño and Votruba-Drzal, 2011; Jennings & Greenberg, 2009). Teachers who are able to manage a positive relationship with their students will provide a positive emotional climate that supports student enthusiasm, enjoyment, and confidence in their school lives (Pianta, & Stuhlman (2004). The effect of this emotional support is dependent upon how responsive the teacher is to children's academic and emotional needs and the degree to which the teacher serves as a secure base for children to volunteer answers and responses (La Paro, Pianta, & Stuhlman, 2004). For instance, an early longitudinal study demonstrated that some kindergarten teachers show competencies—including sensitivity towards and quick response to student emotional and educational needs—which help, maintain healthy

teacher-student relationships. These competencies in turn significantly affect the students' social behaviors and closeness to teachers in elementary schools (Birch & Ladd, 1998).

On the other hand, Birch and Ladd (1998) conclude that children who have poor relationships or conflict with teachers may be less motivated to display prosocial behavior. Teachers who lack the skills to maintain a positive relationship with their students will also tend to create a negative emotional climate, which includes evidence of anger, hostility, or aggression that the teacher and/or children exhibit in the classroom. This negative climate will potentially undermine student social and emotional development and increase student behavioral problems (La Paro, Pianta, & Stuhlman, 2004)

In addition to influence on students' social and emotional development, teacher-student relationships can also shape students' academic achievement in important ways. Students who report having better quality relationships with their teachers also report being about three times more engaged in learning than students who report having poor relationships (Klem & Connell, 2004). A within- and between-student study by Maldonado-Carreño and Votruba-Drzal (2011) examined teacher-student relationship quality and students' academic achievement and behavioral problems from kindergarten through fifth grade. Results suggest that increases in teacher-student relationship quality are associated with higher teacher-reported academic gains and less social behavior problems consistently throughout elementary school. The findings confirm that teacher-student relationships play an important role in students' ability to acquire the social and academic skills.

Teacher Expectations

The influence of teachers' expectations on student achievement has been demonstrated by numerous studies. When teachers described their students as having potential for remarkable achievement growth, these students exhibited significantly more academic gains than controlled students (Rosenthal, Baratz, & Hall, 1974; McDonald & Elias, 1976). For instance, teachers' expectations may be influenced by students' previous performance. A low-achieving student may receive quite different treatment in a class. For example, teachers give low-achieving students direct answers rather than try to improve their responses by giving clues or repeating or rephrasing questions (Good, 1987); teachers also criticize low-achieving students more often for failure and praise them less frequently for their successes (Babad, Inbar, & Rosenthal, 1982).

These unequal treatments caused by differing teacher expectations may lead to not only different students' academic performance, but also students' different social-emotional competencies such as self-concepts, learning motivation, and interactions with teachers and peers (Prawat, 1992). Kagan (1992) demonstrated that teachers' expectations toward students' achievement affect not only their own behavior but also students' social behaviors and academic performance. Moreover, Chang (2003) found that teachers' beliefs about misbehaviors in the classroom and teachers' overall support of students have important effects on the students' future classroom behaviors, peer interactions, and self-perceived social competence.

The relationship between teachers' expectations and students' behavior is complex in part because teachers hold multiple beliefs and also because students possess

distinctive characteristics. Teachers' expectations and their impacts on students are associated with broader social forces. For example, stereotypical images often imply that African Americans are not as intelligent as whites (Perry et al., 2003). These widely circulating stereotypical images may influence teacher expectations of students based on their ethnicity. Therefore, differing teacher expectations have not been limited to perceptions of student ability but also include differences based on ethnicity and SES. Rubovits and Maehr (1973) argue that African American students received significantly less attention and praise than white students. Also, black West Indian students often face the same low expectations as African Americans, even though many black West Indian students have higher achievement levels than their African American counterparts (Perry et al. 2003). In contrast, teachers usually expect Asian American students to be high achieving, though achievement levels among Asian Americans vary depending on ethnicity and other factors (Lee, 1996).

In addition to ethnicity, a number of studies have shown that teachers have different expectations and behave differently toward high-SES and low-SES students. Auwarter and Aruguete (2008) have argued that children from higher SES backgrounds are judged more favorably than are equally performing children of lower social class backgrounds. Teachers who have high expectations for high-SES students usually believe that SES is a predetermining factor for students' achievement. As a result, they will likely feel ineffective when working with low-SES students. These feelings of ineffectiveness may lead to fewer teaching efforts and therefore, perpetuate poor student achievement

and emotional health. Warren (2002) found that 75% of teachers from low-income schools show low teaching efficacy.

Teacher Self-Efficacy

Self-efficacy, as defined by Bandura (1986), refers to "people's judgments of their capabilities to organize and execute courses of action required attaining designated types of performance" (p. 391). In these terms, teacher self-efficacy refers to teachers' beliefs in their own abilities to plan, organize, and carry out activities required to attain given educational goals (Skaalvik & Skaalvik, 2007; Zimmerman & Cleary, 2006). Teacher self-efficacy has been assumed to increase if teachers believe that students' achievement and behavior can be influenced by education (Guskey & Passaro, 1994; Rose & Medway, 1981).

A number of studies point out that teachers' self-efficacy has important influences on children's academic achievement (Caprara, Barbaranelli, Steca, & Malone, 2006; Muijs & Reynolds, 2001). Teacher self-efficacy associates with student achievement in several ways: Teachers with high self-efficacy are more likely to create positive classrooms and to use classroom management approaches and adequate teaching methods that encourage students' autonomy (Caprara, Barbaranelli, Steca, & Malone, 2006; Guskey, 1988). For example, a study of teacher self-efficacy reported that teachers' self-efficacy, which was predicted by students' previous performance, contributed significantly to student achievement and teacher job satisfaction (Caprara, Barbaranelli, Steca, & Malone, 2006).

Furthermore, teacher self-efficacy has been found to be associated with enhanced student social and emotional skills, increased self-esteem, strong self-direction, and more positive attitudes toward school (Midgley, Feldlaufer, & Eccles, 1989). Teachers who show low self-efficacy often suffered from stress (Maslach, 1982), which is reported to negatively affect their students' emotional development (Kokkinos, Panayiotou, & Davazoglou, 2005; Roeser, Arbreton, & Anderman, 1993). Low self-efficacy can make teachers ineffective and inefficient in their teaching roles, so that their students' emotional health is correspondingly undermined (Kyriacou, 1987; Kokkinos, Panayiotou, & Davazoglou, 2005). For example, Beer and Beer (1992) found that low-efficacy and stressed teachers provide significantly less information, praise, and acceptance to their students. In addition, stressed teachers are more likely to refer students for misbehavior, and teachers' perceptions of students' social and emotional health decline as stress levels increase (Cremerius, 1992).

Teacher Practices

Classroom Management

Educational research and practice place great emphasis on the role of organization and management in creating a well-functioning classroom. Teachers' managerial abilities have been consistently found to relate positively to student achievement in every study (Evertson, 1989; Bowman & Stott, 1994; Bruner, 1996). A number of studies show that, especially in the primary grades, teachers who can structure, maintain, and monitor learning activities have an obvious advantage in teaching skills over those teachers who lack these managerial skills (Pianta, & Stuhlman, 2004). In evaluating the effectiveness

of school programming, Stallings and Hentzell (1978) report that teachers' managerial competence relates in fundamental ways to students' academic gains. Classrooms that are well managed may reduce the processing demands on children and subsequently promote learning (Leinhardt & Putnam, 1987). For example, effective teachers tend to establish routines for themselves and their students so that children know the expectations for behavior and work; therefore, teachers are prepared for their lessons and spend less time in managerial tasks (e.g., Yates & Yates, 1990). Moreover, when teachers monitor children well and prevent disruptive and off-task behaviors, children are able to spend more time engaged in productive learning activities (Yates & Yates, 1990).

In addition to academic achievement, effective teacher classroom managerial skills also help improve student prosocial behaviors. Teachers frequently experience less disruptive behavior and higher motivation when they use more effective behavior management strategies, have more organized and routine management structures, and implement strategies that make students active participants in classroom activities (Bowman & Stott, 1994; Bruner, 1996). One example comes from a randomized field experiment conducted in 29 classrooms from Grades 1-6 to evaluate the effectiveness of classroom management workshops (Evertson, 1989). The results showed that teachers who participated in classroom management workshops exceeded the control group teachers in the use of key management principles taught in the workshops and had students with less inappropriate behavior during classroom tasks and peer interactions.

Teacher-student Interaction

Teaching has commonly been described as an "interactive and interpersonal process" (Klauer, 1985), suggesting that interactions between children and teachers are a primary mechanism through which classroom experiences affect student development. Classroom interactions build a positive classroom environment that facilitates students' engagement in higher-order thinking about problems, plays an active role in their academic learning, and enhances relationships with their teachers. When in classrooms that foster teacher-student and student-student interactions, children are more likely to meet their social and emotional needs that will improve their social-emotional and cognitive development (Catalano et al. 2003). Numerous studies report that students' interactions with teachers in two domains are critical to student success: one is the emotional interaction domain (Pianta, Hamre, & Allen, 2012), and the other is the instructional interaction domain (Carver & Klahr, 2001).

In the emotional domain, teachers' efforts to support students' social and emotional functioning in the classroom—through the positive facilitation of students' interactions with their teachers and peers—are key elements of positive classroom climates that promote higher student social-emotional skills (Pianta, Hamre, & Allen, 2012). A recent social-emotional program uses the RULER approach to improve the social and emotional climate in classrooms (River et al., 2013). The RULER approach includes skill-building lessons and activities that aim to improve the quality of classroom interactions so that the climate becomes more supportive and engaging. During classroom interaction, teachers provide students opportunities to analyze the emotional aspects of personal experiences, academic materials, and current events. As a consequence, students

learn to manage their feelings and improve communication skills (via classroom discussion) for solving emotionally-related problems.

Although appropriate emotional teacher-student interactions can significantly support student social and emotional functioning, this type of interaction can also boost student motivation and learning (Pianta, Hamre, & Allen, 2012). Students in emotionally supportive classrooms environments tend to choose more complex cognitive activities (Howes & Smith, 1995) and perform better academically (Rimm-Kaufman & Chiu, 2007; Wentzel, 1998). Pianta et al. (2004) argue that teachers who are responsive to student needs tend to frequently ask for students' thoughts, follow students' leads, and respond to students' interests and motivations. In these classrooms, students engaged a process that has positive associations with their academic learning and emotional communication.

In terms of instructional interaction—the second domain critical to student success— recent years have seen more emphasis placed on the connection between cognitive development and educational environment (Carver & Klahr, 2001). Teachers who conduct quality instructional interactions tend to use individualized pedagogy, collaborative learning strategies, and an emphasis on critical thinking, all of which allow students to flexibly gain usable knowledge rather than simply learn facts (Flynn, 2009; Boaler & Staples, 2008). Effective instructional interactions can enhance students' awareness and understanding of their own thinking processes, which in turn promotes their meta-cognition and academic performance (Bransford, Brown, & Cocking, 1999). Nevertheless, some studies also detect the importance of instructional interaction to student social and emotional development. For example, Girolametto and Weitzman

(2002) state that highly skilled teachers monitor students' performance and engagement in activities and provide praise or encouragement. In this way, teachers provide feedback to students through scaffolding and support, which gives children confidence for continuing engagement in activities and thus provides potential increased emotional competence (Girolametto & Weitzman, 2002).

To briefly recapitulate the main points covered in the above literature review, numerous findings support each of the following points. The tone that teachers set in their classrooms is important in different ways in improving students' academic and social-emotional development. Teacher-student relationships relate more to students' social-emotional development than academic achievement, while teachers' self-efficacy and expectations towards students' later accomplishment shows even effects on both students' academic and social-emotional development. Based on the classroom climates, some teacher practices—teachers' classroom management and emotional and instructional interactions—are fundamentally related to students' academic achievement and social-emotional development. This study will build hierarchical models for each academic or social-emotional outcome to estimate teacher effectiveness in creating supportive classroom climates and effective teacher practices, which may help estimate teachers' effectiveness in terms of raising students' social-emotional skills while improving academic achievement. Based on these previous studies, the following research questions are brought up and answered in this paper.

1. Are teachers who are effective in terms of raising students' academic achievement also effective in terms of improving social-emotional skills?

2. What specific classroom climates (teacher-student relationship, teacher expectation, and self-efficacy) promote both students' academic achievement and social-emotional skills?

3. What teacher practices (classroom management, teacher-student interaction) may enhance both students' academic achievement and social-emotional skills?

Methodology

Data Sources and Variables

The present study used the Early Childhood Longitudinal Study, Kindergarten Class of 2010–11 (ECLS-K: 2011), which is following a nationally representative sample of children from kindergarten through their elementary school years (Tourangeau et al., 2015). Several characteristics of ECLS-K make it highly suitable for addressing the research questions of this study. First, the student sample is approximately nationally representative. This is desirable because accountability practices are commonly implemented in response to federal legislation (e.g., No Child Left Behind). Having a national sample, as opposed to a local sample, broadens the generalizability of the results so that they are more applicable to federal policy. Second, The ECLS-K provides current information about today's elementary school children and data relevant to emerging policy-related domains not measured fully in the previous studies. Third, ECLS-K includes two waves of academic records covering both fall and spring semesters, many measures of student demographics, and teacher characteristics that are necessary for

examining the viability of using control covariates to address teacher effects on student social-emotional and academic gains.

The ECLS-K second grade longitudinal fall sample has 18,174 children, while the spring sample includes only 5201 children to save the cost of data collection (Tourangeau et al., 2015). To control for student mobility, students who did not have records and were not taught by the same teacher in fall and spring were omitted. Therefore, the sample for the present study included 4,764 students in 2,046 classrooms. Also due to high mobility during elementary education, there were only 409 classrooms having more than three students included in the sample. To answer the first research question, only 409 classrooms were adopted as an analysis unit to estimate teachers' effectiveness in raising academic and social-emotional gains. To answer the second and third questions, the whole sample of 4,764 students was used to estimate teacher-level variables.

Demographics and Control Variables

Student age, gender, ethnicity, and social-economic status are controlled because these variables have been found to affect both social-emotional skills and academic achievement. Emotion and behavior control are often found to increase with age during early age (Epstein Synhorst, Cress, & Allen, 2009). Typically, children do become more skilled at interacting with peers and teachers when aging (Howes, 1988). Concerning gender difference, some research shows that girls express more positive emotions than boys (Chaplin & Aldao, 2013). Girls tend to be more skilled in emotion and behavior control, while boys are found to be more aggressive and to show more externalizing emotions such as anger (Denham et al., 1990; Morrison et al., 2010; Chaplin & Aldao,

2013). In addition to gender, ethnicity also plays an important role in social-emotional and academic development. For instance, Hsin and Xie (2014) found that Asian students exerted greater academic effort and usually earned higher grades than other ethnic groups. Furthermore, SES usually play an important role in students' development. Prosocial behavior and higher academic achievement have been observed more often in children from higher SES families (Bandura et al., 1996; Sirin, 2005). A number of studies have also shown that children from low-income families are considered to be at risk for developmental delays in emotion and behavior regulation and to demonstrate fewer prosocial behaviors (Philips & Lonigan, 2010). In the present study, gender and SES were drawn from the fifth wave of samples, collected when participants were in the fall of their second year in school. Gender was coded 1 for girls and 0 for boys. SES was a continuous variable created by the providers of the ECLS-K data that ranged from -3 to 3 (a mean of z-scores of measures of parent educational level, parent occupational status, and family income).

In addition to demographics, students' initial scores, chronological age, and assessment timing are also found to affect student outcomes. The test scores recorded at the beginning of second grade are identified as the initial status that controls for students' achievement gains during their second grade. Assessment timing is another important issue to be considered when analyzing gains. Most sampled children were born throughout the second half of 2004 and the first half of 2005. Students who were tested at different chronological ages may show different gains in assessments. In addition to ages, assessment date ranged from August to December for the fall data collections, and from

March to June for the spring data collections. Children assessed later in a data collection period may be expected to have an advantage over children assessed earlier. For example, children assessed in September for the fall data collection and in June for the spring data collection have more time to learn knowledge and skills than do children assessed first in November and then again in March. These differences in interval may have an impact on analysis results (Tourangeau et al., 2015).

Outcome Variables

Social and emotional skills. The ECLS-K dataset included adaptations of four constructs from the full Social Skills Rating System (SSRS, Gresham & Elliott, 1990), which is available as composite variables. Appendix table 1A provides a list of the variables used in this study and their descriptive statistics. Four social skill scales were developed based on teachers' responses to these questionnaire items, on which teachers reported how often their children exhibited certain social skills and behaviors using a four option frequency scale ranging from "never" to "very often." The score on each scale is the mean rating on the items included in the scale. Higher scores indicate that the child exhibited the given behavior more often. Teachers completed the SSRS scales either during a phone or in-person interview.

The four teacher scales are as follows: self-control (4 items), interpersonal skills (5 items), externalizing problem behaviors (6 items), and internalizing problem behaviors (4 items). The self-control subscale measured "the child's ability to control behavior by respecting the property rights of others, controlling temper, accepting peer ideas for group activities, and responding appropriately to pressure from peers" (U.S. Department

of Education, National Center for Education Statistics, 2001, p. 2.16). The interpersonal skills subscale asked teachers to rate "the child's skills in forming and maintaining friendships, getting along with people who are different, comforting or helping other children, expressing feelings, ideas, and opinions in positive ways, and showing sensitivity to the feelings of others." The teacher-reported measure of externalizing problem behaviors consists of items that rate the frequency of students externalizing problem behaviors, including fighting, arguing, anger, impulsiveness. The items that make up the measure of internalizing behaviors ask about the apparent presence of anxiety, loneliness, low self-esteem, and depression. The internal consistency reliability (Cronbach's alpha) estimates of the self-control, interpersonal skills, externalizing problem behaviors, and internalizing problem behaviors scales are generally high, equaling .81, .86, .87, and .78, respectively (Tourangeau et al., 2015).

Academic achievement. Theta scores are provided in the ECLS-K: 2011 data file for each student who participated in the direct cognitive assessment in three cognitive domains, including science, mathematics, and reading. The theta score is an estimate of a child's ability in each particular domain based on his or her performance on the items, which were calculated using item response theory (IRT) procedures. IRT is a method for modeling assessment data that makes it possible to calculate an overall score for each domain measured for each child that can be compared to scores of other children regardless of which specific items a child is administered. To calculate the IRT-based overall scale score for each domain, a child's theta is used to predict a probability for each assessment item that the child would have gotten that item correct. Then, the

probabilities for all the items fielded as part of the domain in every round are summed to create the overall scale score. The theta scores are reported on a metric ranging from -8 to 8, with lower scores indicating lower academic ability and higher scores indicating higher academic ability (Tourangeau et al., 2015).

In addition to the test scales and procedures, the validity of the direct cognitive assessments was derived from test specifications. The reading test specifications are based on the NAEP Reading Frameworks for 2009, with the addition of basic reading skills and vocabulary categories that are suitable for early grades. The mathematics test specifications are based on the 1996 NAEP mathematics frameworks for grades 4 and above, which are then extended down to earlier grades based current curriculum standards. For science test items, the 2009 standards of six states (Arizona, California, Florida, New Mexico, Texas, and Virginia) were reviewed to find common topics that are taught in second grade. Furthermore, the internal reliabilities among three theta scores in spring of second grade are relatively high, ranging from .83 to .94. Science, the domain with the most diverse content and the smallest number of items, had lower reliability coefficients (.83) than reading (.91) and mathematics (.94).

Predictor Variables

Classroom climate. Several factors set classroom climate. The variables chosen for this study are based on teachers' characteristics and attitudes toward their teaching work and their students. As an important component of classroom climate, teacher-student relationship has important effects on students' early development across a wide range of domains including motivation, enjoyment, and confidence in their school lives

(Pianta & Howes, 2002; Maldonado-Carreño and Votruba-Drzal, 2011; Jennings & Greenberg, 2009). The measurement for teacher expectation is the questionnaire item asking whether teachers share affectionate relationships with their students. A Likert scale was used, with 1 coded as "definitely does not apply" and 5 coded as "definitely applies," which suggests that the higher the number, the healthier relationship teachers have with their students. In measuring expectations, teachers reported what level of education they expect their students to accomplish, using a four option degree scale ranging from "receive less than a high school diploma" to "earn an advanced degree."

There are three questions measuring teacher self-efficacy. As argued in the literature review, teachers who believe in their teaching capacities are more likely to use classroom management approaches and adequate teaching methods that encourage students' autonomy (Caprara, Barbaranelli, Steca, & Malone, 2006; Guskey, 1988). Teachers' positive beliefs in their social-emotional competence have also been associated with students' increased self-esteem, strong motivation, and more positive attitudes toward school (Midgley, Feldlaufer, & Eccles, 1989; Borton, 1991). Therefore, three questions chosen as predictors cover social-emotional and academic domains of teacher self-efficacy. The first question asks teachers if they believe they are able to get through to even the most difficult or unmotivated students. This question is measuring teacher self-concept in terms of their own social-emotional competence in dealing with students. The second question asks whether teachers believe they can significantly affect a student's achievement by trying different teaching methods. The third question asks if teachers agree that students will enjoy learning and become independent thinkers as a

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result of the lesson plans teachers created. These two questions are measuring teachers' confidence in improving students' academic achievement and critical thinking skills. Three questions all use five option agreement scales ranging from 1 as "strongly disagree" and 5 as "strongly agree".

Teacher practices. Classroom management is one important teacher practice that has a notable association with students' academic and social-emotional development. Two domains of classroom management are critical to student success: one is behavioral management (Emmer & Stough, 2001), and the other is classroom structural management (Kunter, Baumert, & Köller, 2007). For behavioral management, the survey question asks teachers "how much time per day would you estimate that you spend on classroom discipline?" Available responses range from 1 ("less than 15 min a day") to 6 ("2 hours or more a day"). As argued by Burden (1995), spending time on classroom discipline is a method to encourage appropriate behavior, establish a cooperative classroom, and implement instruction more effectively. In addition to behavioral management, effective teachers also tend to establish classroom structure and routines for themselves and their students to make instruction more efficient and effective (Yates & Yates, 1990).

Grouping is another important structural management strategy that can improve attitudes toward school, foster achievement, develop thinking skills, and promote interpersonal and intergroup cooperation (Blumenfeld, Marx, Soloway, & Krajcik, 1996). They found that successful groups promote student exchanges that enhance reasoning and higher-order thinking, information organizing and integrating, and perspective taking and accommodation to others' ideas. The most common form of ability grouping is the use of

reading groups, where teachers assign students to different small groups on the basis of reading ability. These groups work on different materials at rates unique to their needs and abilities (Coldiron et al., 1987). Similar methods are often used in mathematics, where there may be two or more math groups operating at different levels and rates (Slavin, 1987). The present study has three questions covering grouping strategies. The first question item concerns the frequency with which teachers divide students into small groups. The other two questions ask the number of groups teachers arranged based on students' achievement levels in both reading and math. These two questions are also used to measure the grouping strategies that teachers adopt. The five options scale ranges from 0 as "Do not use achievement groups" to 5 "Five or more."

In addition, teacher-student interaction is also divided into two domains: instructional interaction and emotional interaction. Appropriate emotional teacher-student interactions can significantly support student social and emotional development and boost student motivation (Pianta, Hamre, & Allen, 2012). As stated in the literature review, students in emotionally supportive classroom environments tend to perform better on academic tasks and exhibit more prosocial behaviors (Howes & Smith, 1995; Rimm-Kaufman & Chiu, 2007; Wentzel, 1998). The variables chosen to measure teachers' emotional interaction with students are: whether teachers share an affectionate and warm relationship with students, and whether teachers encourage their students to share feelings and experiences with them. Questions use five options, with the scale ranging from "definitely does not apply" to "definitely apply."

In terms of instructional interaction, we intended to include teachers' practices that encourage students' critical thinking, promote interactive communication with teachers and peers, and incorporate art materials to increase attention and motivation. Teachers who conduct quality instructional interactions tend to use individualized pedagogy, collaborative learning strategies, and an emphasis on critical thinking, all of which are found by researchers to enhance students' understanding of their own thinking processes, promote their academic performance, and encourage engagement in classroom activities (Flynn, 2009; Boaler & Staples, 2008; Mayer, 2002). In the present study, the instructional interaction variable includes questions that ask the frequency that teachers use art materials and teach students to distinguish their own point of view in reading classes. Math-related questions ask the frequency that teachers conduct equal-sized groups to gain an understanding of multiplication and ask students to describe portions of simple shapes using the words halves, fourths, and quarters. And the science-related question asks the frequency with which teachers lead the discussion of scientific findings orally with students. There is a six-option scale for questions related to sharing point of view, understanding multiplication, describing portions of shapes, and discussing scientific findings. Options for discussing scientific findings range from "not taught" to "more than 20 days from the first day of school until today," while the other questions have options ranging from "not taught" to "more than 80 days from the first day of school until today." In addition, there are seven options to assess the frequency of using art materials: "Never," "Once a month or less," "Two or three times a month," "Once or twice a week," "Three or four times a week," and "Daily." In general, the higher value

suggests the higher frequency for each teacher practice. The table of descriptive variables

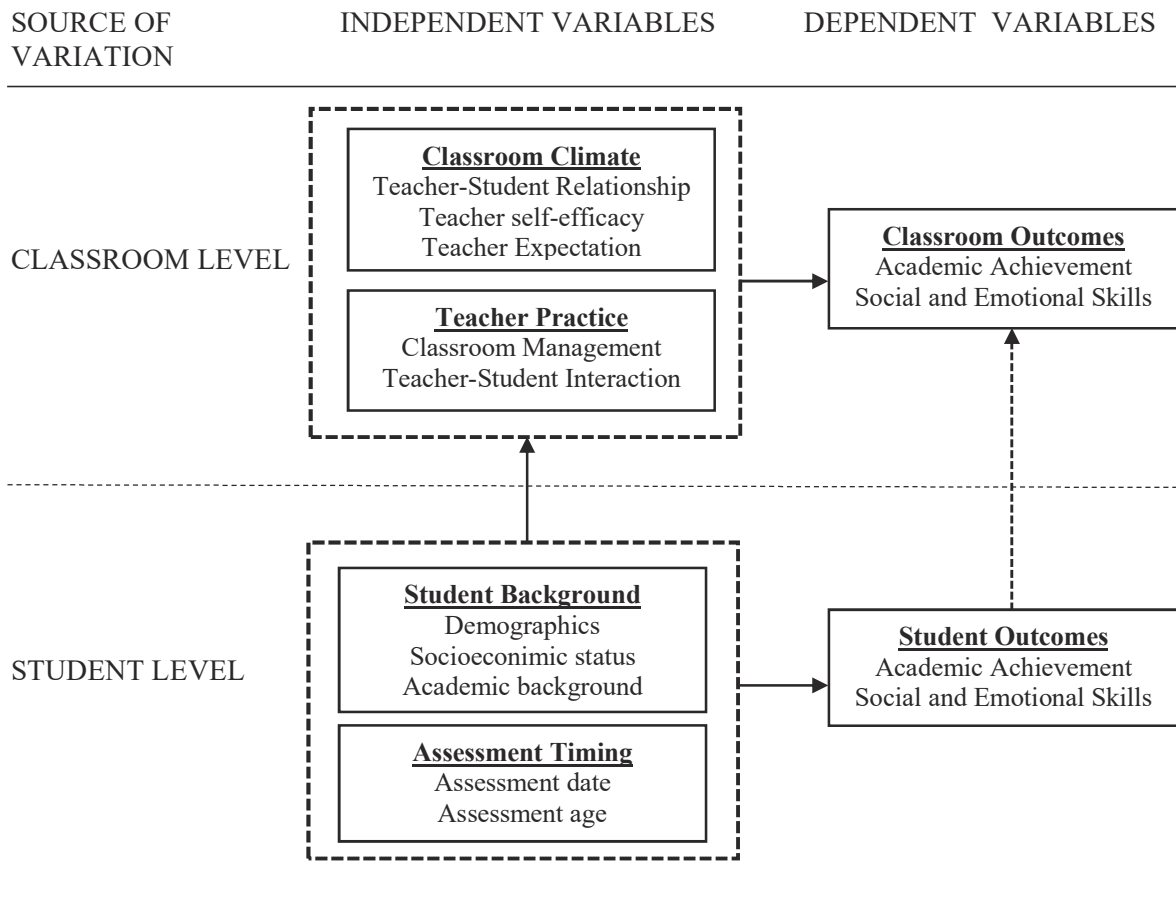of all variables is provided in appendix table 1A.

SOURCE OF VARIATION   INDEPENDENT VARIABLES   DEPENDENT VARIABLES

CLASSROOM LEVEL

Classroom Climate
Teacher-Student Relationship
Teacher self-efficacy
Teacher Expectation

Teacher Practice
Classroom Management
Teacher-Student Interaction

Classroom Outcomes
Academic Achievement
Social and Emotional Skills

STUDENT LEVEL

Student Background
Demographics
Socioeconimic status
Academic background

Assessment Timing
Assessment date
Assessment age

Student Outcomes
Academic Achievement
Social and Emotional Skills

Figure 1. *A multilevel theoretical framework of teacher effects.*

Theoretical Framework

Variable selection and model building in this study are guided by a multi-level

theoretical framework that recognizes the variation in student achievement gains due to

two nested levels: student level and classroom level. In Figure 1, the framework provides

a comprehensive list of variables that were used in this study to explore the association

between teachers' influence and student achievement and the sources of variation that were controlled in the model.

In the figure, student-level predictors are conceptualized as student demographics and time adjustments, which are defined as controlled variables that account for the student achievement scores variation. These controlled variables also helped control the variation between classrooms that is mainly characterized by variation between different teacher characteristics. The classroom level predictors (classroom climate and teacher practices) are the teacher effect that is hypothesized to potentially affect the achievement gains of students. In order to control the variables that are beyond the control of teachers, the student behavior status variable is used to control for the variation in classroom contents. Dependent variables are the outcome measures used to gauge teacher effects. In general, the main interest in teacher effect research is in the association between the teachers' characteristics and practices and student achievement gains.

Model Specification

This study uses hierarchical linear modeling to examine teacher effectiveness in raising student academic achievement and social and emotional skills. For each outcome, several student level controlled variables were estimated. Each model includes a measure of achievement at the start of the second grade as the first important covariate controlling for students' prior achievement. Two covariates that adjust for student differences in chronological ages at the point the student took the exams, and the amount of time between two achievement tests administered in fall and spring, are also included in the model as control variables. In addition, six student background and demographic

variables—one gender variable, one socioeconomic status variable, and three ethnicity variables—were added to the student level model. The ethnicity measures are three dummy coded variables: Black, Hispanic, and Asian, while the White is set as a reference variable.

The equations for the student level models are shown below:

$$Achievement\ Gains_{ij} = \beta_{0j} + \beta_{1j}\ Initial\ Scores + \sum_{p=2}^{2} \beta_{pj}\ Time\ Ajustment_p +$$

$$\sum_{p=4}^{5} \beta_{pj}\ Demographics_p + e_{ij} \qquad e_{ij} \sim N\ (0, \sigma^2)$$

As described above, the outcome is social-emotional score or academic achievement gains. The subscripts (i and j) denote the nested structure of the data; students (i) are nested in classrooms (j), administered by singular teachers. The model controls for initial scores that are based on the test scores taken in fall of second grade, and time adjustments that measure the time duration between the two test administrations. To adjust estimates for differences in student inputs, continuous control variables are grand mean centered, while category variables are uncentered. All slope coefficients are fixed. β_{0j} represents the conditional mean on the outcome for each classroom. e_{ij} represents the student residuals, which describes the deviation of each student's achievement scores from the mean score of the classroom. σ^2 is the estimated variance of the student residuals in the population.

Based on the student level equation, the classroom level equations are:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}\ Mean\ Behavior + \sum_{p=2}^{9} \gamma_{0p}\ Climate_p + \sum_{p=11}^{9} \gamma_{0p}\ Practices_p + u_{0j}$$
$$\beta_{1j} = \gamma_{10}$$
$$\dots$$
$$\beta_{8j} = \gamma_{80}$$

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Classroom mean achievement scores (β_{0j}) in reading, math, or science are the outcomes. γ_{00} represents the adjusted grand mean of achievement scores. u_{0j} is the classroom residuals, which describe the deviation in the mean scores for each classroom from the grand mean. These residuals are also the teachers' value-added estimates, which are used to examine the correlation between classroom means collected from each achievement score. τ_{00} is the variance in the classroom residuals and describes the variance in the achievement scores across classrooms.

Since the four teacher-reported social-emotional skill scales were average scores of several question items, the distribution of each scale is semi-continuous and right-censored. I tended to use Tobit transformation (Tobin, 1958) to estimate linear relationships between social-emotional skill variables and student-level variables. The residuals saved from Tobit transformation were used as outcomes for second level model estimation. On the other hand, I also examined the residuals for the raw data treated as a continuous variable and using an OLS estimator while not perfect. Figure 2 is an example of normality comparison between raw data residuals and Tobit transferred residuals of self-control outcome. While comparing the normality and homogeneity of two sets of residuals, the residuals for the raw data treated as continuous variable and using and OLS estimator were approximately normal and homogeneous and better distributed to meet model assumptions than the Tobit-transformed residuals. Therefore, in the present study, the raw data social-emotional outcomes were treated as a continuous variable and using an OLS estimator.
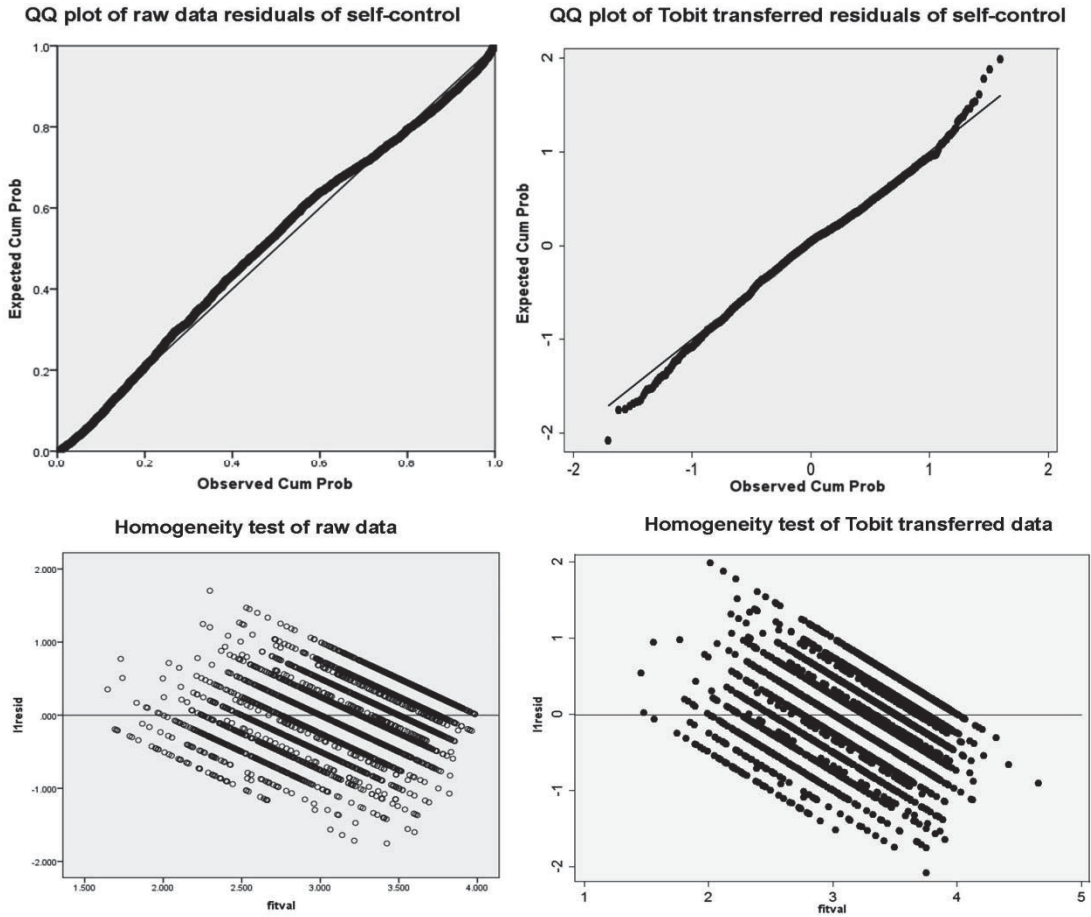
Figure 2. *Normality and homogeneity of raw data residuals and Tobit transferred residuals.*

Results

Research Question 1

The first question asks whether teachers who are effective in terms of raising students' academic achievement are also effective in terms of improving social-emotional skills. To answer this question, the classroom average residual gains of their students under ordinary least squares (OLS) were used to estimate the associations between

teacher effectiveness on academic achievement and social-emotional skills. Due to the high student mobility, only 409 out of 2046 classrooms have more than three stable students in each classroom from the point they entered as second graders from fall to spring. In order to reduce the biased estimates due to the small class size, classrooms with three or less students were omitted for this part. Additionally, all of the student-level covariates were kept in each model for the purpose of maintaining consistent control covariates in each model. OLS residuals were collected based on our seven models with the same controlled covariates. Table 1 presents the results of the correlation coefficients of classroom level residuals for each of the seven achievement gains.

Table1: Correlation Matrix of OLS Residuals of Outcome Variables

	N	1	2	3	4	5	6	7
1. Reading theta score	409	1						
2. Mathematics theta score	409	.269**	1					
3. Science theta score	409	.163**	.223**	1				
4. Self-control	409	-0.003	0.037	0.006	1			
5. Interpersonal skills	409	0.083	0.082	0.079	.693**	1		
6. Externalizing problem behaviors	409	-0.049	0.004	0.042	-.426**	-.398**	1	
7. internalizing problem behaviors	409	-0.052	-0.091	0.031	-.258**	-.244**	-.276**	1

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

Results suggest that there is high correlation within the academic achievement and social-emotional skills groups respectively. Among the three academic outcomes, math achievement tended to have the highest correlation with reading outcomes ($r = .269$, p<0.001), while the correlation between math and science outcomes yielded the lowest significance ($r = .163$, p=0.001). Compared to academic outcomes, inter-group correlations were more significant among social and emotional outcomes. Students'

ability in self-control correlated highest with their interpersonal skills ($r = .693$, p<0.001), while interpersonal skills correlated least with internalizing problem behaviors ($r = .244$, p<0.001).

Although the within group outcomes correlated significantly with each other, the across group correlations between academic and social-emotional outcomes yielded little significance. From the correlation matrix, little evidence supported associations between teacher effectiveness in improving student achievement gains and social-emotional skill development. This finding suggests that teachers who are effective in improving students' academic achievement gains are not necessarily effective in improving students' social and emotional skill development.

Research Question 2

The purpose of question 2 is to determine what classroom climates have significant effects on both student academic achievement and social-emotional skill development. To address this question, a backward approach was adopted to examine the effect of each classroom climate variable. At the student level, control covariates were dropped if they were not significant. Once the student level model was fixed, classroom climate covariates were added to classroom-level models. The standardized coefficients in Table 2 present the set of classroom climate covariates and its effect size on each outcome. As mentioned above, the three classroom climate categories (teacher-student relationship, teacher expectation, and teacher self-efficacy) were selected because they are hypothesized to constitute teachers' characteristics base on the theoretical framework. Each significant variable represents an aspect of teachers' characteristics that not only

build up the classroom climates but are also associated with students' academic or social-emotional skills development. Note that since we controlled students' initial assessment outcomes at the fall of second grade, which account for about 70% of the variance of students' achievement in the spring, the effects of teacher factors showed generally small sizes in outcomes. Also note that since different variables have different scales, all variables were standardized in scale to ensure that the coefficients for each model could be interpreted as effect size (Schielzeth, 2010).

The results of our seven models show some consistent effects across students' academic achievement gains and social-emotional skills. First of all, better teacher-reported average classroom behaviors were reported to significantly predict most of the students' academic achievement and social-emotional skills. Of these outcomes, teacher-reported classroom behavior had the largest predictive effect on reducing externalizing problem behaviors: for each one unit increase in the standard deviation of classroom behavior, there was a 0.06 decrease in the standard deviation of the externalizing problem behaviors. However, the general classroom behaviors did not have significant relationships with students' mathematical gains, interpersonal skills, or internalizing problem behaviors.

In addition to classroom behaviors beyond teachers' control, the three teacher-related predictors had different relationships with students' achievement gains. Teacher expectation was found to significantly enhance both students' academic achievement and social-emotional skill development, when controlling for all other covariates. For each standard deviation increase of educational level that teachers expect of their students (i.e.,

expectation levels range from expecting students to graduate from high school to expecting them to finish four years of college), the students' academic achievement gains increased by an average of 0.031 standard deviation. And for each standard deviation increase of educational level that teachers expect, the students' social-emotional skills increased by an average of 0.071 standard deviations.

In addition to these consistent effects, a higher number of inconsistent effects on students' academic and social-emotional outcomes were found. First of all, the warm teacher-student relationship was reported to be effective only in improving students' social and emotional outcomes. Of the four social and emotional outcomes, interpersonal skills tended to have the strongest associations with teacher-student relationship ((β = .109, p < .001). In contrast, the warm teacher-student relationship had the least influence on students' internalizing problem behaviors (β = -.054, p < .001). Secondly, a relatively higher number of effects of teachers' self-efficacy were found on students' academic achievements than social-emotional skills. Teachers' beliefs on getting through to the most difficult or unmotivated students showed significant effects on students' reading achievement gains (β = .013, p = .050). However, teachers' beliefs in their ability to get through to the most difficult or unmotivated students tended to relate negatively with students' science achievement gains (β = -.016, p = .048) and math achievement gains (β = -.018, p = .042). In terms of teachers' beliefs in their capacity to create an enjoyable climate for their students to enhance critical thinking, significant effect registered only on students' self-control skills (β = .023, p = .002).

Table 2: The Regression coefficient

	Reading	Math	Science	Self-control	Interpersonal skills	Externalizing problem behaviors	Internalizing problem behaviors
Classroom Climates							
Control Classroom Behavior							
Teacher-report Classroom behaviors	0.014*	0.005	0.022**	0.039**	0.021	-0.060**	0.000
Teacher-student Relationship							
Warm relation with student	0.006	0.002	0.000	0.069**	0.109**	-0.048**	-0.054**
Teacher Self-efficacy							
Change methods can improve achievement	0.013*	0.009	-0.004	0.012	0.016	0.020	0.001
Believe can get through to students	0.001	-0.016*	-0.018*	0.019	0.020	-0.022	0.001
Instruction make student more critical thinking	-0.001	0.004	0.002	0.023**	0.021	0.000	-0.015
Teacher Expectation							
What education level expect child to accomplish	0.037**	0.028**	0.030**	0.073**	0.088**	-0.049**	-0.073**
Teacher Practices							
Behavioral Management							
Time spent in emphasizing discipline	0.006	0.003	-0.016*	-0.026*	-0.025*	**0.048	0.027*
Structural Management							
Frequency of small grouping	-0.014*	-0.004	-0.005	0.003	0.006	0.009	0.020
Number of ability grouping in reading	0.006	0.005	0.023**	0.011	0.000	-0.009	0.019
Number of ability grouping in math	-0.015*	-0.002	-0.003	-0.026*	-0.017	0.012	0.010
Instructional Interaction							
Using art materials	0.005	-0.007	0.006	0.018	0.033**	0.004	0.026*
Ask children share different point of view	-0.001	-0.014	-0.002	0.026*	0.024	-0.013	-0.003
Equal math groups for multiplication	0.004	0.017*	-0.015	0.013	0.000	0.015	-0.006
Describe portions of shapes	0.005	0.007	0.010	-0.010	0.006	-0.021	-0.026*
Communicate scientific findings	0.003	0.008	0.000	0.003	0.019	0.015	0.017
Emotional Interaction							
Be In tune with child feeling	0.023**	0.005	0.010	0.054**	0.075**	-0.031*	-0.044*
Encourage sharing emotion with teachers	-0.006	-0.004	-0.003	0.012	0.028	0.030*	-0.010

Note: Teacher Practices variables were added based on the Classroom Climates models
*p<0.05, **p<0.01

In general, among all the teacher-created classroom climates, only teacher expectation has a significant relationship to both students' academic achievement and social-emotional skill development. In contradistinction, the warm teacher-student relationship only has association with students' social and emotional skills, while teacher self-efficacies have different effects on students' academic achievement gains and social-emotional skills.

Research Question 3

The third research question addresses a similar problem as question 2 but from a different aspect. It asks what teacher practices (classroom management, teacher-student interaction) may enhance both students' academic achievement and social-emotional skills. To address this question, the teacher practices variables were added into the models based on the classroom climate models. A backward approach was adopted to estimate the effect of teacher practices on students' academic and social-emotional domains. The teacher practices models results (see Table 2) show a different association between teacher practices and students' gains on these two domains.

Among the classroom management variables, there was a consistent negative effect of the time teachers spend on classroom discipline and handling disruptive behavior on both academic and social-emotional outcomes. Discipline time suggested a negative outcome on all four social-emotional domains. But this negative effect only had significance on students' science achievement gains ($\beta = -.016$, $p = .025$). Additionally, as a structural management practice, the grouping strategies showed disproportionate effects on academic outcomes: a significant negative association was found between the

time that students work in small groups with teachers and students' reading achievement gains (β = -.014, p = .038). The number of ability groupings in reading tended to relate to higher science achievement gains (β = .023, p = .004), while the number of ability groupings in math suggests a negative association with reading achievement gains (β = -.015, p = .029) and self-control (β = -.026, p = .038).

The instructional interaction variables showed different effects on academic achievement and social-emotional skills. Results suggested that the two reading-related instructions predictors showed only significant effect on partial social-emotional skills. There is positive association between teacher practices of using more art materials in the classroom and both students' increased interpersonal skills (β = .033, p = .008) and reduced internalizing problem behaviors (β = .026, p = .046). Encouraging students to share their distinguished point of view also showed positive effect on self-control (β = .026, p = .047) and a marginally significant effect on interpersonal skills (β = .024, p = .066). For math-related instruction, dividing equal study groups for students to learn multiplication in math class significantly improved math achievement gains (β = .017, p = .035), while asking students to describe portions of shapes using given words only shows a marginally significant effect on reducing internalizing problem behaviors (β = .026, p = .086) such as anxiety or depression. However, conducting the discussion on scientific findings presented no effect across academic or social-emotional outcomes.

Additionally, results suggest that the emotional interactions are reported to significantly increase students' reading achievement gains (β = .023, p = .004) and enhance all four social-emotional skills, especially when teachers provide emotional

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support to their students. Encouraging students' to share emotions with teachers is, however, associated with increased externalizing problem behaviors ($\beta = .030$, $p = .030$), including expressing anger, depression, and anxiety more frequently.

In general, the above results have the following main findings: first of all, increased time spent on behavioral management in the classroom suggests a negative association with both academic and social-emotional development. Secondly, teacher-student emotional interaction has positive effects across four social-emotional skill development and reading achievement gains. In addition, grouping strategies show a more significant effect on academic achievement gains than social-emotional skill development. Moreover, reading- and math-related instructions suggest different effects on both academic and social-emotional development, while sharing scientific findings presents no effect across seven outcomes.

Discussion

The results for research question 1 suggested that the four social-emotional outcomes had a stronger correlation with each other than the three academic outcomes. This result could be explained by the fact that all of the four social-emotional outcomes were reported by teachers, which might introduce subjective biases and measurement errors, while the academic outcomes are more objective since they assessed individual student performance using uniform measurements (Raykov & Marcoulides, 2011). In addition, no substantial correlation was found between academic achievement gains and social-emotional skill development on teacher-level residual, while controlling for

students' demographics. This finding suggested that teachers who are effective in terms of increasing their students' academic achievement gains from fall to spring quarter are not necessarily effective in terms of improving students' social-emotional development.

In addition to the correlation matrix, our results also suggested some teacher practices only associate with one domain. On the one hand, some teacher practices suggest more significant effects on academic achievement. First of all, teacher self-efficacy in their supportive interaction with students and effective academic instruction tended to show more influence on students' academic than social-emotional skill development. But some of these relationships to academic achievement ran counter to our expectation. For instance, teachers' beliefs in their abilities to get through even to the most difficult or unmotivated students tended to have a positive association with math and science achievement gains. Teacher self-efficacy is a complicated indicator of teacher effectiveness, partly because it usually has an indirect impact on students' achievement; the impact is often mediated by teachers' stress, job satisfaction, and attitudes toward students (Dicke et al., 2014). In addition, there is a possibility that too much confidence in teaching ability might create blind spots so that they might not adopt different teaching methods to accommodate students' real needs.

Secondly, in terms of structural management, more significant associations were measured on students' academic outcomes than on social-emotional skill development. For instance, a negative effect of small grouping was found, which implies that as a strategy aimed at promoting peer cooperation, poorly managed grouping might impede students' learnings. As Blumenfeld et al. (1996) argued, effective group work requires

students to share ideas, take risks, disagree with and listen to others, and generate and reconcile point of view. These requirements are usually hard to accomplish, especially in a class with unevenly achieving students. For instance, giving and seeking help in groups may benefit high-achievers when students can give elaborate explanations to each other. In contrast, relative low-achievers may not know how to help effectively and may require special training to learn how to elaborate their thinking. They may not know how to ask questions that represent their problem, or they may be unable to make use of the help they receive. In addition to disproportionate explanation ability, in heterogeneous groups high-achievers may dominate group discussion, while low-achievers may remain silent or withdraw because they lack necessary skills and misinterpret tasks (Cohen, 1986). These findings indicate that small-group instruction can be used in inappropriate ways when practiced in heterogeneous groups with disproportionately achieved students, which may in turn create dysfunctional interactions among students. Overall, the effects of group work depend on how the group is organized, what the tasks are, who participates, and how the group is held accountable.

To reduce group heterogeneity, teachers usually adopt ability grouping strategies in their instruction. The results suggest a positive association of ability grouping in reading on science test outcomes while a negative relationship of ability grouping in math to reading test outcomes was found. Several educational theorists disagree sharply on the effectiveness of ability grouping. On the one hand, ability grouping is supposed to increase student achievement primarily by reducing the heterogeneity of the class or instructional group, making it more possible for the teacher to provide instruction that is

neither too easy nor too hard for most students (Atkinson & O'Connor, 1963). The technique should also allow the teacher to increase the pace and level of instruction for high achievers and provide more individual attention, repetition, and review for low achievers (Slavin, 1987). On the other hand, Good and Marshall (1984) argue that students being labeled and assigned to a low group may communicate low expectations. Further, students who are placed in low achieving groups have been observed to experience a slower pace and lower quality of instruction than do students in higher achieving groups.

This negative association of low ability groupings on students' academic achievement also related to students' low social-emotional ability, though the associations were not overall significant. This finding shares some common ground with Marsh's (1984) study, which found that ability grouping had negative effects on students' self-concepts within low ability groupings. Their lower self-concepts might impede their motivation to communicate with peers and teachers, increase their anxiety and depression, and hinder their self-regulation development. Other researchers who are against ability grouping argue that all students need opportunities to interact with a wide range of peers, rather than being limited by their academic abilities (Persell, 1977; Sorensen, 1970). This interaction limitation might also impede their social-emotional skills development.

On the other hand, another set of practices suggested more effects on the social-emotional domain than the academic domain. For instance, a warm and affectionate teacher-student relationship only had a significant association with students' social-emotional development. This finding is consistent with the growing body of evidence

claiming that students exhibit more prosocial behavior when their relationship with their teacher is warm and close (Howes, 2000; Kienbaum, Volland, & Ulich, 2001). Supportive teacher-student relationships play an important role in a healthy classroom environment that promotes student enthusiasm, enjoyment, and confidence in classroom tasks (Davis, 2001; Pianta & Howes, 2002; Maldonado-Carreño and Votruba-Drzal, 2011). Emotionally-supportive teachers offer gentle guidance to students, engage in positive communication with students, and demonstrate respect for students through eye contact, respectful language, and a warm voice (Pianta, LaParo, & Hamre, 2008). The positive early teacher–student relationship relates to declined externalizing behaviors over time (Silver et al., 2005). However, the results suggested that a warm teacher-student relationship did significantly predict students' academic achievement. This finding could be explained in terms of project scope; our one semester long study might not have provided sufficient duration, as the emotional support from teachers might only have long-term and indirect effect on students' academic achievement, which is mediated by higher motivation, more focused on academic tasks, and less misbehaviors (Klem & Connell, 2004). In other words, this effect might not be salient from the short-term achievement gains of second graders.

Although the correlation matrix and some teacher practices effects suggest that the teacher effectiveness in improving academic achievement and social-emotional development are unrelated, a set of teacher practices showed significant associations with both domains. From the aspect of classroom climates, teachers' attitudes toward the level of education they expected their students to achieve in the future had the most significant

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relationship to academic achievement and social-emotional skills. These associations imply that when teachers described their students as having potential for achieving higher education, these students might be more motivated and confident in academic tasks; in turn they would exhibit more prosocial behaviors and improved mental health.

Nevertheless, some researchers hold the view that the relationship between teachers' expectations and students' behavior is complex, partly because teachers hold multiple beliefs and also because students possess distinctive characteristics. Teachers' expectations and their on students are associated with students' prior performance, ethnicity, SES, and gender (Good, 1987). Therefore, in the present study, there is a possibility that teachers' high expectation toward students' future achievement may be shaped by previous students' performance in the classroom, which may further facilitate students' motivation, confidence, and interactions with peers and teachers.

In addition to teacher expectation, teachers demonstrating sympathy with students' emotions also increased both students' social-emotional skill and reading achievement gains. Emotional interaction is a foundation of the teacher-student relationship, which is established via a process of exchanging information and developing understanding and similar feelings with each other (Frymier & Houser, 2000). Through this process, teachers provide emotional support that facilitates students' affective learning, which presents more understanding with each other. Wilson et al. (2007) found that students in classrooms with high emotional support showed significantly better social competence and teacher-reported self-control than students in classrooms with low observed emotional support. In a study conducted in preschool classrooms, emotionally supportive

interactions predicted teacher-reported social competence using a broad measure of social skills (Mashburn et al., 2008). More recently, Merritt et al., (2012) found that higher teacher emotional support related to lower student aggression and higher behavioral self-control. The above results confirm the contribution of teacher emotional support to students' social behaviors and self-control skills, suggesting the importance of classroom interactions in children's acquisition of social and emotional competence. However, teachers encouraging students to express emotion with teachers showed an increased expression of externalizing behavior problems, which contrasted with the effect of sharing feelings with students. This finding implies that the encouragement of emotional expression may increase the frequency of students exhibiting negative emotion, such as anger, fear, depress, and anxiety to teachers. Therefore, the teacher-reported externalizing behaviors problem may consequently increase.

In contrast to the positive effect on these two domains, the time teachers spent on classroom discipline showed a negative association with social-emotional outcomes and science outcomes. One interpretation might be that the increased time that teachers spent on classroom discipline suggests a generally high frequency of misbehavior in classrooms. Teachers who spent too much time on classroom discipline may spend less time on academic instruction and inadvertently intensify the conflict between their students.

In addition to the above findings that show teacher effectiveness in improving academic achievement or social-emotional skills or improving both domains, we were surprised to find that teachers' instructional interactions with their students failed to

significantly correlate with academic achievement. In another word, the reading, math, and science specification variables had little effect on their corresponding academic outcomes. This may be because the variables chosen were expressive-oriented that were hypothesized to increase students' interaction with peers and teachers, and therefore helping students have better understandings of what they have learned. However, these practices rarely shown immediate effect on students' achievement gains from fall to spring; only the grouping for understanding multiplication suggested a outstanding increase in students' math outcomes.

In general, even though the residuals correlation matrix showed no significant correlation between teachers' effectiveness in terms of improving academic achievement and social-emotional skill, there were classroom climates and teacher practices—teacher expectations, time spent in classroom discipline, and providing emotional support to students—that had significant associations (while yielding small effect size) both on academic achievement gains and social-emotional skill development.

Policy Implication

Academic achievement and social-emotional skills are worth equivalent attention from parents, teachers, and schools, as they are two important domains that have long-term effects on students' later life. However, the current education system overemphasizes academic success, which has deflected attention from improving students' social-emotional skills in recent decades. Though programs such as PATHS, CSC, and Second Step are effective in raising students' social and emotional skills and preventing behavior problems, these trainings are rarely requirements of teacher credential programs

(Jennings & Greenberg, 2009). The results of this study, therefore, have some pedagogical implications for teacher training that may help education policy makers address the important issue of students' social-emotional development in the classroom.

Teachers play pivotal roles facilitating classroom instruction, especially for early grades. As such, they should adopt a variety of effective practices to successfully promote both students' academic achievement and social-emotional skills. Although this study found that the average teacher effectiveness in improving students' academic achievement did not correlate with teacher effectiveness in raising students' social-emotional skills, some teacher practices did prove effective at improving both academic and social-emotional outcomes. This finding implies that teacher competencies in enhancing emotional communications with students, managing the time spent on classroom discipline, and exhibiting positive expectations for students' future success, may improve both academic achievement and social-emotional skills. Adding professional development workshops on these topics into teacher training routines may increase teacher effectiveness in enhancing both academic achievement and social-emotional skills.

However, this study does not imply that teacher training should only focus on those practices that may impact both academic achievement and social-emotional skills. The characteristics that affect academic achievement or social-emotional skills solely are also vital in promoting teacher effectiveness. A successful educational policy should coordinate all of these practices to provide effective instructional and emotional support

as well as the creation of healthy classroom environments, which are key elements in maximizing student and school success.

Limitation

       This study is, however, limited to a short period of time (one semester) in examining students' achievement gains, which yielded little change while controlling students' initial scores. Another limitation is that both social-emotional skills and teacher-student relationships were reported by teachers, which may have introduced bias due to teacher subjectivity. I suggest that future research should extend to longitudinal studies including students at higher grades and should also rely on a more objective assessment to examine students' social-emotional skills.

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Appendix

Table A1: Descriptive Statistics

	N	Mean	SD	Min	Max
Control Variables					
Control Reading Scores	4764	1.81	0.67	-0.68	3.83
Control Math Scores	4764	1.89	0.85	-3.52	7.36
Control Science Scores	4764	1.07	1.07	-4.56	3.59
Control Self-Control Skills	4764	3.24	0.59	1	4
Control Interpersonal Skills	4764	3.11	0.62	1	4
Control Externalizing Behavior Problem	4764	1.63	0.57	1	4
Control Internalizing Behavior Problem	4764	1.49	0.48	1	4
Assessment Time Adjustment	4764	219.53	24.13	121	299
Gender	4764	0.53	0.50	0	1
Black	4764	0.10	0.30	0	1
Hispanic	4764	0.38	0.49	0	1
Asian	4764	0.08	0.27	0	1
Students' Ages (Month)	4764	97.11	4.33	75.19	121.78
SES	4764	-.088	0.84	-3.01	2.44
Independent Variables					
Control Classroom Behavior					
Teacher-report Classroom behaviors	4764	3.48	0.88	1	5
Teacher-student Relationship					
Warm relation with student	4764	4.27	0.89	1	5
Teacher Self-efficacy					
Change methods can improve achievement	4764	4.20	0.64	1	5
Believe can get through to students	4764	3.88	0.82	1	5
Instruction make student more critical thinking	4764	4.43	0.57	1	5
Teacher Expectation					
What education level expect child to accomplish	4764	2.87	.776	1	4
Behavioral Management					
Time spent in emphasizing discipline	4764	2.05	1.19	1	6
Structural Management					
Frequency of small grouping	4764	2.79	0.81	1	6
Number of ability grouping in reading	4764	1.98	1.88	0	26
Number of ability grouping in math	4764	3.76	1.96	0	23

Instructional Interaction					
Using art materials	4764	4.47	1.40	1	7
Ask children share different point of view	4764	4.14	1.36	1	6
Equal math groups for multiplication	4764	3.49	1.53	1	6
Describe portions of shapes	4764	3.10	1.32	1	6
Communicate scientific findings	4764	4.19	1.58	1	6
Emotional Interaction					
Be In tune with child feeling	4764	3.92	1.012	1	5
Encourage sharing emotion with teachers	4764	4.04	1.062	1	5
Dependent Variables					
Academic Achievement					
Reading theta score	4764	2.17	0.66	-8	8
Mathematics theta score	4764	2.42	0.81	-8	8
Science theta score	4764	1.55	0.98	-8	8
Social and Emotional Skills					
Teacher report self-control	4764	3.21	0.62	1	4
Teacher report Interpersonal skills	4764	3.11	0.65	1	4
Teacher report Externalizing problem behaviors	4764	1.71	0.61	1	4
Teacher report internalizing problem behaviors	4764	1.58	0.51	1	4