MULTILEVEL ASSOCIATIONS BETWEEN BULLYING VICTIMIZATION, SCHOOL ENGAGEMENT, AND SOCIAL-EMOTIONAL LEARNING

by

Chunyan Yang

A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Education

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TABLE OF CONTENTS

LIST OF TABLES ix
LIST OF FIGURES x
ABSTRACT xii

Chapter

1 LITERATURE REVIEW 1

Bullying Victimization 2

Definition of Bullying Victimization 2
Negative Outcomes of Bullying Victimization 3
Potential Factors Moderating the Outcomes of Bullying Victimization 4

Types of Bullying Victimization Experienced by Students 5
Students' Demographic Characteristics 5
Students' Social-Emotional and Social-Cognitive Functioning 7
Students' Relationships with Peers and Teachers 7
Factors at Classroom and School Levels 9

School Engagement 12

Effects of Students' Demographic Characteristics on School Engagement 13
Effects of Schools' Demographic Characteristics on School Engagement 15

Bullying Victimization and School Engagement: Perspectives from Risk and Resilience Research 16

Risk Framework 17
Resilience Framework 17
Bullying Victimization and School Engagement: The Main Effects and Moderation Effects of School Climate and Social-Emotional Learning 18

School Climate 19

Teacher-student relationships. 21

Student-student relationships 23

Social-Emotional Learning Approach 24

Bullying Victimization and School Engagement: A Multilevel Investigation 26
Main Research Questions 29

2 METHOD 33

Data Collection Procedures 33
Participants 35
Measures 37

Bullying Victimization 39
School Engagement 40
Teacher-Student Relationships 41
Student-Student Relationships 42
Teachers' Use of SEL Instructional Techniques 42
Student-Level Demographic Factors 43
School-Level Demographic Factors 44

Procedures for Statistical Analyses 45

3 RESULTS 57

Descriptive Analyses 58
Hierarchical Linear Modeling 62

Research Question One 63

Effects of Student-Level Demographics 63
Effects of School-Level Demographics 66

Research Question Two 68

Proportions of Change in Variance in School Engagement Explained by the Addition of Student-Level and School-Level Predictors 72
Multilevel Main Effects of Bullying Victimization 72
Multilevel Main Effects of Social-Emotional Learning Approach 74

Research Question Three 82

Student-Level, School-Level, and Cross-Level Interaction Terms in Models 6 and Models 7 83

Proportions of Change in Variance in School Engagement Explained by Predictors and Moderators Added in Models 6 and Models 7 86
Student-Level Moderation Effects 91
School-Level Moderation Effects 96
Cross-Level Moderation Effects 101

4 DISCUSSION 108

Interpretations of Findings 109

Multilevel Main Effects of Demographic Factors on School Engagement 109

Gender 110
Race/ Ethnicity 112
Grade Level 113
School Size 114
Percentage of Students Receiving Free or Reduced-Price Lunch 115
A School's Racial/Ethnic Diversity Index of Its Student Body 116

Multilevel Main Effects of Demographic Factors, Bullying Victimization, and the SEL Approach on School Engagement 117

A Multilevel Understanding of School Engagement and Bullying Victimization 117
Stronger Relation of the SEL Approach to School Engagement Compared to Bullying Victimization 119
Stronger Main Effects at the School Level than at the Student Level 121

Multilevel Moderation Effects of Teacher-Student Relationships 121
Multilevel Moderation Effects of Teacher' Use of SEL Instructional Techniques 124
Main and Moderation Effects across Types of Bullying Victimization ... 125

Practical Implications 126

Strategies for School Engagement Promotion 126
Strategies for Bullying Prevention and Intervention 128

Limitations and Future Research 131

Cross-Sectional Design of the Study 131
Multilevel Nature of the Study 132
Complexity in Conceptualizing and Measuring School Engagement 133

Complexity in Conceptualizing and Measuring of the SEL Approach 134
Use of Self-Reports 136
Complexity in Interpreting the Significance of Cross-Level Moderation Effects 138

Conclusion 139

REFERENCES 141

Appendix

A APPROVAL LETTER FROM THE UNIVERSITY'S INSTITITIONAL REVIEW BOARD 175

B ITEMS OF THE SCALES AND SUBSCALES USED IN THIS STUDY ... 176

LIST OF TABLES

Table 1 Demographic Information for Student and School Participants in the Final Student and School Samples 38

Table 2 Variables Included in the Four Sets of Hierarchical Linear Regression Models 48

Table 3 Descriptive Statistics of the Continuous Variables at the Student Level 60

Table 4 Descriptive Statistics of the Continuous Variables at the School Level . 61

Table 5 Multilevel Main Effects of Student-Level and School-Level Demographic Factors on School Engagement in Model 2 64

Table 6 Proportion of Variance Explained at the Student and School Levels for Models 2-7 with Four Types of Bullying Victimization as Predictors ... 69

Table 7 Statistical Estimates of Main Effects of Student-Level Demographic Factors, School-Level Demographic Factors, and Bullying Victimization on School Engagement in Models 3 76

Table 8 Statistical Estimates of Main Effects of Student-Level Demographic Factors, School-Level Demographic Factors, Bullying Victimization, and the SEL Approach on School Engagement in Models 5 78

Table 9 Statistical Estimates of Multilevel Main Effects of Demographic factors, Bullying Victimization, and the SEL Approach on School Engagement and the Multilevel Moderation Effects of the SEL Approach in the Association between Bullying Victimization and School Engagement in Models 7 88

LIST OF FIGURES

Figure 1 The Hypothesized Model 30

Figure 2 Main Effects of Gender, Race/Ethnicity, and Grade Level on School Engagement 65

Figure 3 Multilevel Main Effects of Overall Bullying Victimization on School Engagement 75

Figure 4 Multilevel Main Effects of Overall Bullying Victimization and SEL Approach on School Engagement 81

Figure 5 Multilevel Moderation Effects of the SEL Approach in the Association between Overall Bullying Victimization and School Engagement 87

Figure 6 Moderation Effect of Teacher-Student Relationships (Student Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement 93

Figure 7 Moderation Effect of Student-Student Relationships (Student Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement 94

Figure 8 Moderation Effect of Teachers' Use of SEL Instructional Techniques (Student Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement 95

Figure 9 Moderation Effect of Teacher-Student Relationships (School Level) in the Association between Overall Bullying Victimization (School Level) and School Engagement 98

Figure 10 Moderation Effect of Student-Student Relationships (School Level) in the Association between Overall Bullying Victimization (School Level) and School Engagement 99

Figure 11 Moderation Effect of Teachers' Use of SEL Instructional Techniques (School Level) in the Association between Overall Bullying Victimization (School Level) and School Engagement 100

Figure 12 Moderation Effect of Teacher-Student Relationships (School Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement 103

Figure 13 Moderation Effect of Student-Student Relationships (School Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement 104

Figure 14 Moderation Effect of Teachers' Use of SEL Instructional Techniques (School Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement 105

ABSTRACT

This study investigated the multilevel main effects of student-level and school-level demographic factors, and the multilevel main effects of bullying victimization and the social-emotional learning (SEL) approach on students' perceptions of school engagement. It also investigated the multilevel moderation effects of the SEL approach in the association between bullying victimization and school engagement. The SEL approach was represented by three factors: teacher-student relationships, student-student relationships, and teachers' use of SEL instructional techniques. Data were collected from 25,896 students, grades 4-12, in 114 Delaware schools that completed the Delaware School Surveys. Results of hierarchical linear analyses found that students' gender and race/ethnicity and their school's grade level (elementary, middle, or high school) and racial/ethnic diversity index had significant and meaningful associations with school engagement.

With student-level and school-level demographic factors controlled, students' perceptions of frequent bullying victimization was found to be significantly and meaningfully associated with lower school engagement. This was found at both the student and school levels. With demographic factors and bullying victimization controlled, positive teacher-student relationships, positive student-student relationships, and teachers' frequent use of SEL instructional techniques were significantly and meaningfully associated with greater school engagement, as reported by students at both the student and school levels.

Visual presentations of the multilevel moderation effects indicated that the cross-level moderation effects of school-level teacher-student relationships and teachers' use of SEL instructional techniques in the student-level association between bullying victimization and school engagement were potentially meaningful in practice, although they were not statistically significant. That is, the visual presentations indicated that the magnitude of the negative effect of student-level bullying victimization on school engagement may be mitigated with increased positive teacher-student relationships, as reported by students at the school level. In contrast, the magnitude of the negative effect of student-level bullying victimization on school engagement may be intensified with teachers' more frequent use of SEL instructional techniques, as reported by students at school level. The multilevel main effects of bullying victimization and the SEL approach on school engagement and the multilevel moderation effects of the SEL approach in the association between bullying victimization and school engagement were consistent across subtypes of bullying victimization.

Findings support transactional developmental-ecological theory and social-ecological theory in understanding the phenomenon of bullying victimization and school engagement. They also support the whole-school approach in school engagement promotion and bullying prevention and intervention. Moreover, they suggest that it is important to develop a comprehensive conceptualization and measure of the SEL approach that includes several important components, including core sets of social-emotional learning skills, an appropriate measure of SEL instruction, and key school climate factors that foster a caring and safe school environment.

Chapter 1

LITERATURE REVIEW

In recent decades, school shootings have sparked increased public concern for the safety of students and have raised public awareness that bullying is a precursor in many school shootings (Seals & Young, 2003). Fortunately, victims of bullying retaliate rarely by shooting those who bully them (Cornell & Mayer, 2010); but, there are many other negative outcomes associated with being a victim of bullying. Primary among them is disengagement from school. Still, not all victims of bullying exhibit disengagement and we have limited understanding about the individual- and school-level factors that explain this phenomenon (Kochenderfer-Ladd & Skinner, 2002; Troop-Gordon & Quenette, 2010). In particular, we know little about those factors that might moderate the association between bullying victimization and school engagement. To fill this research gap, the current study employed a multilevel framework to examine the relationship between bullying victimization and school engagement with a focus on (a) how student-level demographic factors (i.e., gender, race/ethnicity) and school-level demographic factors (i.e., grade level, school size, socioeconomic status, and racial/ethnic diversity of its student body) are related to the school engagement of students; (b) how bullying victimization and the social-emotional learning (SEL) approach, as represented by teacher-student relationships, student-student relationships, and teachers' use of SEL instructional techniques, are related to school engagement; and (c) the extent to which the SEL approach moderates

the association between bullying victimization and school engagement at both the individual and student levels and across student and school levels.

Theory and research pertaining to bullying victimization and school engagement are reviewed below. First, the definition and types of bullying victimization and individual-level and school-level factors related to the outcomes of bullying victimization are reviewed. Second, the conceptualization of school engagement and research on individual-level and school-level demographic predictors of school engagement are reviewed. This is followed by a brief review of risk and resilience research related to the association between bullying victimization and school engagement. Third, research is reviewed on school climate and the SEL approach, with a focus on three particular aspects of the SEL approach (i.e., teacher-student relationships, student-student relationship and teachers' use of SEL instructional techniques), in promoting school engagement and preventing bullying and other behavior problems. This includes research on the moderation effects of teacher-student relationships, student-student relationships, and SEL instructional techniques in the association between bullying victimization and school engagement. Finally, the importance of applying a multilevel framework to understanding the predictive factors of school engagement and the moderation effects of the SEL approach in the association between bullying victimization and school engagement is discussed.

Bullying Victimization

Definition of Bullying Victimization

Bullying is a form of aggression, but is commonly distinguished from aggression in that bullying, but not always aggression, involves an intentional,

systematic and usually recurrent action instigated by an individual or group of individuals who are attempting to inflict physical and psychological harm on another person or persons in order to gain power, prestige, or goods (Espelage & Swearer, 2003; Sutton, 1999). Unlike aggression, bullying involves an imbalance of power and strength between bullies and victims where the victims are often unable to defend themselves (Olweus, 1997). In much of the existing literature, "bullying victimization" is often used interchangeably with the term "peer victimization", which is referred to as being a target of aggression by peers (not including siblings) and friends (Hawker & Boulton, 2000). Although aggressive behavior in peer victimization often refers to conventional school-focused bullying, researchers point out that peer victimization may also include nonbullying types of aggression, such as dating violence, peer sexual assault and harassment, property crimes, and other forms of aggression that occur outside of school (Turner, 2011). Moreover, unlike bullying victimization, peer victimization may refer to one-time or infrequent occurrences of aggression. For these reasons, in the current study the term "bullying victimization" is used, which excludes the nonbullying types of peer victimization and focuses on forms of bullying that most commonly appear in school and are experienced repeatedly by victims.

Negative Outcomes of Bullying Victimization

The negative outcomes of bullying victimization have been widely discussed in the research literature. It is well established that victims of bullying are more likely than their non-victimized peers to experience low self-esteem and self-worth, loneliness, anxiety, depression, and other internalizing problems (Hawker & Boulton, 2000; Juvonen, Nishina, & Graham, 2000; Reijntjes, Kamphuis, Prinzie, & Telch, 2010; Swearer, Collins, Radliff, & Wang, 2011). Bullying victims also are more likely

to exhibit externalizing problems, such as aggression, delinquency, and truancy (Hanish & Guerra, 2002; Reijntjes et al., 2011; Schwartz, Gorman, Nakamoto, & Toblin, 2005). Likewise, low academic achievement is associated with bullying and peer victimization (Glew, Fan, Katon, Rivara, & Kernic, 2005; Juvonen, Wang, & Espinoza, 2011; Nakamoto & Schwartz, 2010, 2011; Schwartz et al., 2005). For example, a longitudinal study conducted in urban middle schools demonstrated a robust direct association between bullying victimization and lower academic performance over time (Juvonen et al., 2011).

Potential Factors Moderating the Outcomes of Bullying Victimization

Although the existing literature has shown that bullying victimization is related to negative outcomes, it is clear that bullying does not lead to negative outcomes for many children. For example, Hoover, Oliver, and Hazler (1992) found that more than 75% of middle to high school students reported being bullied at some point during their school life, but fewer than 15% indicated that they felt they had been severely affected in any particular domain of adjustment (e.g., academic, emotional, or social). Moreover, research indicates that the presence, nature, and severity of adjustment difficulties evidenced by victims of bullying vary considerably depending on several factors related to the characteristics and experiences of individual students and the classroom and school contexts in which they are placed. These factors include: (a) the types of bullying victimization experienced by students, (b) student-level demographic characteristics (i.e., gender, race/ethnicity background, and age/grade level), (c) students' social-emotional and social-cognitive functioning, (d) students' relationships with peers and teachers, and (e) classroom and school factors. Research related to each of these factors is reviewed below.

Types of Bullying Victimization Experienced by Students

Three types of bullying and bullying victimization have commonly been identified in the research literature: physical, verbal, and relational victimization (Archer & Coyne, 2005; Card & Hodges, 2008). In physical bullying, the victim's physical integrity is attacked, such as being hit or hurt. In verbal bullying, the victim's status is attacked or threatened with words or vocalizations, such as being called names. In relational bullying, bullying behaviors cause, or threaten to cause, damage to peer relationships, and particularly to friendship and acceptance, such as having negative gossip about oneself spread (Crick & Grotpeter, 1996). Distinctions among these three types of bullying are supported by research showing that they often relate differently to social-emotional and behavioral outcomes. For instance, recent studies among middle school students found that whereas victims of relational bullying tend to report internalizing problems, victims of physical bullying tend to report externalizing problems (Hoglund & Leadbeater, 2007; Hoglund, 2007; Prinstein, Boergers, & Vernberg, 2001; Storch, Nock, Masia-Warner, & Barlas, 2003). Related to verbal bullying, researchers found that students' verbal abuse from teachers had a bidirectional association with students' overtly disruptive behaviors, such as aggression and inattention, whereas it had a unidirectional effect from verbal abuse to internalizing problems (Brendgen, Wanner, & Vitaro, 2006).

Students' Demographic Characteristics

Several demographic characteristics of students, including gender, race-ethnicity and age/grade level, have been found to moderate the outcomes of bullying victimization. As for the effect of gender, studies have yielded mixed results. A number of studies found the correlation between victimization and academic achievement to be stronger for boys than girls (Hanish & Guerra, 2002), but other

studies found it stronger for girls (Hoglund, 2007). In a recent meta-analysis, the combined results from 16 related studies demonstrated no moderation effect of gender in the relationship between bullying victimization and academic achievement and that the relationship was nearly identical for boys and girls (Nakamoto & Schwartz, 2010). With respect to social-emotional outcomes, studies found that bullying victimization predicts emotional distress more strongly for girls (Lopez & DuBois, 2005) or only for girls (Bond, Carlin, Thomas, Rubin, & Patton, 2001). However, one study revealed that bullying victimization, regardless of type, had similar effects on boys' and girls' emotional well-being (Biggs et al., 2010).

Research indicates that the association between bullying victimization and student outcomes also is related to the student's race/ethnicity. For example, Spriggs, Iannotti, Nansel and Haynie (2007) found that all three types of bullying involvement were associated with below-average school performance for Caucasian and Hispanic/Latino students, but not African-American students. Bullying involvement also was related to school satisfaction for African-American and Hispanic/Latino students, but not Caucasian students. The study also found that bullying victimization was associated with students' feelings of being unsafe at school, but only for Caucasian students.

Studies also show that the age or grade level of students moderates the association between bullying victimization and student adjustment outcomes. For example, studies have found that bullying often increases from elementary to middle school (Hazler, 1996; Rios-Ellis, Bellamy, & Shoji, 2000) and then decreases during high school (Espelage & Horne, 2008; Hong & Espelage, 2012) and that middle school students tend to be at highest risk for being victimized (DeVoe, Peter, Noonan, Snyder, & Baum, 2005). This is often found despite middle and high school students

being less likely than elementary students to report bullying victimization (Beran & Tutty, 2002; Pellegrini & Long, 2002; Varjas, Henrich, & Meyers, 2009).

Students' Social-Emotional and Social-Cognitive Functioning

The effects of bullying victimization on students' adjustment to school have been found to depend, in part, on students' social-emotional and social-cognitive functioning (Troop-Gordon & Quenette, 2010). Research suggests that students are at increased risk for negative outcomes when they have low self-esteem or perceive themselves as less socially competent (Grills Ae, 2002; Ladd, 2003), when they tend to blame themselves for being bullied (Graham & Juvonen, 1998; Visconti, Sechler, & Kochenderfer-Ladd, 2013), and when they lack coping strategies in response to bullying (Kochenderfer-Ladd & Skinner, 2002). With respect to coping strategies, their moderation effects on the outcomes of bullying victimization may depend on the type of coping strategy and the nature of the bullying victimization, such as its frequency and severity (Kochenderfer-Ladd & Skinner, 2002). For example, researchers found that approach coping strategies (e.g., problem solving and social support seeking) were effective in decreasing the negative effects of bullying, but only for less severe and infrequent victimization and harassment (Carver, Scheier, & Weintraub, 1989; Kochenderfer-Ladd & Skinner, 2002). It is likely that avoidance coping strategies (e.g., cognitive distancing, internalizing and externalizing) are more adaptive for children with severe and frequent bullying victimization (Carver, et al., 1989).

Students' Relationships with Peers and Teachers

Extensive research studies have shown that the association between bullying victimization and the adjustment outcomes of students is influenced by their

relationships with peers, teachers, and other adults. Having a positive peer relationship, particularly having a best friend, reduces both the chances of being victimized and its negative effect (Cowie, 2000; Owens, Shute, & Slee, 2000). In contrast, lacking peer social support and friends tends to heighten internalizing and externalizing difficulties experienced by victims (Deater-Deckard, 2001; Hodges, Boivin, Vitaro, & Bukowski, 1999; Troop-Gordon, 2005).

The positive relationships that students have with their teachers and other adults at school, home, and in the community also have been found to play an important role in protecting bully victims from maladjustment and promoting their positive school outcomes (Baker, 2006; Murray-Harvey & Slee, 2010; Pomeroy, 1999). Supportive teachers provide a protective buffer that mitigates the negative effects of bullying and builds resilience among at-risk students by setting expectations for prosocial behaviors and providing success-oriented classroom environments and learning experiences (Forlin & Chambers, 2003). In contrast, as shown in a study conducted by Kremer (2010), conflictual teacher-student relationships can exacerbate the effects of victimization on internalizing problems such as sadness, loneliness and anxiety.

The adjustment of students who have been bullied is influenced not only by their relationships with teachers and other adults, but also by students' perceptions of their teachers' reaction to bullying victimization (Troop-Gordon & Quenette, 2010). For example, in a study of fourth to sixth graders, Troop-Gordon and Quenette (2010) found that students' perceptions of their teachers encouraging victims to engage in more passive responses to bullying victimization (i.e., advocating assertion, avoidance, or independent coping) functioned as a moderator in the linkage between victimization and internalizing problems. This was found among boys but not girls;

that is, for boys, victimization was associated with greater internalizing problems when they perceived their teachers as encouraging victims to engage in independent coping and to respond to aggression with avoidance or assertion. Moreover, the researchers suggested that teachers' expectations of students during situations of bullying victimization have implications for students' feelings of self-efficacy in coping with bullying and in their ability to obtain needed teacher support and help in responding to aggressive peers (Troop-Gordon & Quenette, 2010).

Factors at Classroom and School Levels

At the classroom level, research has shown that the effect of bullying on victims' social-emotional adjustment is influenced by their perceptions of the average level and dispersion of victimization experienced by others in their classroom (Bellmore, Witkow, Graham, & Juvonen, 2004; Salmivalli, 2010). Huitsing, Veenstra, Sainio, and Salmivalli (2012) found that bullying victims were better adjusted in classrooms with high levels of bullying victimzation. They were more depressed and had lower self-esteem in classrooms with high centralization of victimization, which refers to classes in which few students were perceived to be bullied by many classmates (Huitsing et al., 2012). Similarly, Nishina and Juvonen (2005) found that students who were treated negatively by peers had fewer negative self-perceptions when they witneesed that others in their class were victimized. Huisting et al. (2012) speculated that in classrooms with high centralization of victmization, bullying victims tend to have a social misfit status and thus are more likely to blame themselves and perceive the reason for their victimization as internal, which leads to more adjusmtent problems.

Few studies have examined the moderation effects of school-level factors in the association between bullying victimization and its negative outcomes perhaps because victimization is influenced more so by individual characteristics rather than by school characteristics (Khoury-Kassabri, 2011). However, as discussed below, research shows that commonly explored demographic characteristics of schools, such as school size, race/ethnicity, and socioeconomic background of the student community, influence bullying victimization.

Research on the association between school size and bullying victimization has yielded mixed findings. On the one hand, researchers found that large school size is associated with increased risk of being a victim of bullying (Bowes et al., 2009). Gottfredson and DiPietro (2011) argued that large schools are often perceived as less secure environments and are likely to be organized more bureaucratically with more formalized social interactions and less direct, cohesive, and trustful interactions and communication among members, which may lead to a greater risk of bullying victimization. On the other hand, Gottfredson and DiPietro (2011) argued that school size may be negatively associated with the prevalence of bullying victimization because larger schools are more likely to have the capacity to offer specialized programs and services to meet the diverse needs of their students and to identify problems and intervene effectively in reducing potential security threats. Other researchers have stated that students in smaller schools may be more similar to one another in socioeconomic and cultural background, so that fewer students feel marginalized or excluded (Davidson & Demaray, 2007). Klein and Cornell (2010) demonstrated that the prevalence rate of bullying offenses was lower in larger schools, although the total number of incidents was higher. Other studies, however, found no significant relationship between school size and the prevalence of bullying

(Hellman & Beaton, 1986; Ma, 2002).

As for the effect of the racial/ethnic background of the school community, some researchers have argued that schools with greater diversity tend to have more diverse values and perspectives, which could increase the potential for conflicts among students and lead to greater victimization (Welsh, Stokes, & Greene, 2000). However, others have argued that victims experience fewer negative outcomes in schools with more diverse racial/ethnic backgrounds. For example, Graham (2006) argued that students in ethnically diverse settings are likely to experience a more equitable distribution of power that would engender fewer victimization experiences. Research suggests that the adjustment outcomes of student victims might depend on whether they belong to larger or smaller ethnic groups within their classrooms or schools. That is, when student victims belong to the larger-sized groups, they may be particularly vulnerable to the negative psychological consequences of victimization, such as loneliness and social anxiety (Bellmoreet al., 2004). In contrast, bullying victims within smaller-sized ethnic groups may be less vulnerable, attributing their social failure more to external factors or other causes that have fewer psychological costs than to factors related to self (Graham, Bellmore, Nishina, & Juvonen, 2009; Juvonen, Nishina, & Graham, 2006).

Far fewer studies have examined the moderation effects of the socioeconomic status (SES) of the student body in the association between bullying victimization and adjustment outcomes. However, the potential effect of the SES of the student body has been indicated by studies that examined the effect of the SES of individual students on their adjustment to bullying victimization. For example, researchers have suggested that students' low SES is associated with the development of personal risk factors, such as emotional dysregulation, which place youth at risk for in-school victimization

(Zins, Elias, & Maher, 2007). Indeed, studies have shown that poverty is an important risk factor in community violence (Khoury-Kassabri, Benbenishty, & Astor, 2005) and exposure to community violence is associated with greater bullying victimization in school (Schwartz & Proctor, 2000).

School Engagement

Research on school engagement has gained increased attention in recent years, with a growing number of studies recognizing that school engagement is related positively to academic achievement, school completion, and higher personal sense of well-being (Estell & Perdue, 2013; Furlong et al., 2003) and negatively to school dropout (Janosz, Archambault, Morizot, & Pagani, 2008), delinquency (Payne, Gottfredson, & Gottfredson, 2003), and substance abuse (Simons-Morton, 2004). However, the growing interest in school engagement is tempered by numerous challenges regarding the definition and conceptualization of this multifaceted construct. Although school engagement has consistently been identified as a positive factor in school, there is little consensus as to what exactly it is.

Widely quoted in the research literature, in defining engagement Finn and Voelkl (1993) described it "…as having both a behavioral component, termed participation, and an emotional component, termed identification" (p. 249). Consistent with this statement, nearly all researchers agree that school engagement includes two components: behavioral and emotional engagement (Finn & Voelkl, 1993; Li, Lynch, Kalvin, Liu, & Lerner, 2011). *Behavioral engagement* refers to academic involvement and participation in the learning activities in the classroom, including effort, attentiveness, self-directed participation, and school attendance or absences. *Emotional/Affective engagement* refers to the affective attitudes to classmates, teachers

and school, including interest, enjoyment, anxiety, and feelings of connectedness. In addition to the behavioral and emotional components, some scholars have suggested that cognitive engagement represents a third component of the school engagement construct. *Cognitive engagement* is defined as a strategic investment in learning, including mental effort directed toward learning, cognitive flexibility, self-regulated motivation to learn and master concepts, and the use of key learning strategies (Fredricks, Blumenfeld, & Paris, 2004; Hoglund, 2007). Despite some researchers recognizing the cognitive components to engagement, consensus on including cognitive engagement as one of the essential components of school engagement has not yet emerged (Li et al., 2011).

School engagement is not only multi-dimensional, it also is malleable and responsive to the interaction between individual and environmental factors (Fredricks et al., 2004). Consistent with this notion, research has shown that school engagement outcomes are related closely to the different forms of engagement and their interaction with demographic characteristics of students (i.e., gender, race/ethnicity, and age) and schools (i.e., grade level, school size, SES and racial/ethnic diversity of its student body).

Effects of Students' Demographic Characteristics on School Engagement

In general, girls report higher levels of school engagement than boys, regardless of type of engagement (Crosnoe, Johnson, & Elder, 2004; Johnson, Crosnoe, & Elder, 2001; Marks, 2000). However, Wang, Willet, and Eccles (2011) found girls to be higher than boys in behavioral and emotional engagement but not in cognitive engagement. Several other studies found that the effects of gender in school engagement varied with age/grade levels and student's race/ethnicity. For example,

Johnson, Crosnoe, and Elder (2001) found that girls' attachment to school was higher in middle school, whereas boys' attachment was higher in high school. This finding is consistent with the well-established gender reversal phenomenon in many aspects of social psychological functioning during adolescence: In high school girls fall below boys in domains in which they once enjoyed advantages in elementary and middle school. Johnson, Crosnoe, and Thaden (2006) further concluded that the patten of gender reversal among middle and high school students' attachment to school occurs only among Caucasian students. In both of the above studies, student attachment to school was related to the social psychological dimensions of school engagement, consisting of the degree to which students felt a sense of belonging in their schools (Johnson et al., 2006).

Research findings on race-ethnicity differences in school engagement have been inconsistent (Johnson et al., 2001; Wang et al., 2011). Several studies indicated that African-American students are more engaged emotionally and less engaged behaviorally compared to Caucasian students (Park, Holloway, Arendtsz, Bempechat, & Li, 2012; Wang et al., 2011). However, Johnson et al. (2001) found that African-American students reported higher levels of behavioral engagement than Caucasian and Hispanic/Latino students, as measured by such indicators as class attendance, attention during class, and time spent on homework. In contrast, African-American students reported lower levels of academic engagement compared to students in other racial/ethnic groups, as indicated by the time spent on homework, but higher behavioral engagement as indicated by the level of effort (Ainsworth-Darnell & Downey, 1998).

Effects of Schools' Demographic Characteristics on School Engagement

Multiple school-level characteristics have been found to predict engagement of students in school, including a school's grade level, school size, SES, and racial/ethnic diversity of its student body (Johnson et al., 2001; Li & Lerner, 2011; Weiss, Carolan, & Baker-Smith, 2010). Research results regarding age/grade level differences in school engagment have been mixed (Marks, 2000; Perry, Liu, & Pabian, 2010; Wang & Eccles, 2012). Although studies comparing school engagement across elementary, middle, and high school levels are rare, researchers have argued that school engagment decreases with increasing grade level (Eccles et al., 1993a; Wang & Eccles, 2012). In a recent longitudinal study of secondary students, the average growth trajectories for school engagement decreased from 7th to 11th grade (Wang & Eccles, 2012). The growth trajectories of school engagement were measured by school compliance, participation in extracurricular activities, school identification, and subjective valuing of learning (Wang & Eccles, 2012). Another study of diverse urban youth revealed no significant grade-level differences in school engagement, which included both the emotional dimensions and behavioral dimensions (Perry et al., 2010). Researchers have argued that the general declining pattern of school engagement can be attributed to a potential mismatch between students' stage of development in middle and high school and the school environment: More specifically, compared to elementary students, many middle and high school students have fewer opportunities to develop strong and positive personal relationships, especially with teachers and classmates (Eccles et al., 1993a; Wang & Eccles, 2012).

Findings have been more consistent in linking school size and SEL to student engagement. Studies have indicated that students tend to be less engaged in large schools, at least in high school. A study using a nationally-representative dataset of

tenth graders found a negative effect on engagement when cohorts were greater than 400 students (Weiss et al., 2010). Likewise, the linkage between SES of the student body and school engagement has been well supported at both the individual and school levels, with research showing a positive correlation (Johnson et al., 2001; Li & Lerner, 2011).

As for the effect of the ethnic composition of the student body, in a national longitudinal study, Johnson et al. (2001) found that students had higher levels of school attachment, but no differences in school engagement, when they attended schools with proportionately more students of their own race/ethnicity compared to schools with proportionately fewer students of their own race/ethnicity. In this study, school attachment was conceptualized similarly to affective/emotional engagement, which referred to the extent to which students felt that they are embedded in, and a part of, their school communities. School engagement was conceptualized similarly to behavioral engagement, which referred to behaviors that broadly represented students' participation in the school, such as trying hard in class, participating in discussions, completing homework, coming to class, being attentive in class, avoiding distracting behavior, and taking part in extracurricular activities (Finn & Voelkl, 1993; Johnson et al., 2001).

Bullying Victimization and School Engagement: Perspectives from Risk and Resilience Research

The association between bullying victimization and school engagement has been supported by two theoretical frameworks: (a) a risk framework, which views school disengagement as the negative consequence of bullying victimization; and (b) a resilience framework, which views school engagement as the resilient response to bullying victimization.

Risk Framework

From the perspective of risk research, bullying victimization is considered a risk antecedent to school engagement. There are two possible paths by which bullying victimization becomes linked to school disengagement. First, children who are bullied by their peers are likely to experience peer rejection and exclusion, which in turn restricts their participation in school activities. Second, because negative peer experiences decrease a victim's motivation to participate in those classroom and school activities, students who are bullied avoid those activities as a means of escaping further bullying. These links between bullying victimization and school engagement have been supported by several empirical studies. In a longitudinal study of students in kindergarten through fifth grade, Buhs et al. (2006) showed that throughout the primary school years chronic peer maltreatment (similar to bullying) forecasted later school disengagement. Different forms of peer maltreatment had distinct effects on children's classroom disengagement, such that chronically excluded children were more likely to refrain from participating in classroom activities (relative to peers), whereas chronically abused children were more likely to avoid school altogether. Another longitudinal study (Li et al., 2011) examined the effects of three different bullying statuses (i.e., being a bully, a victim of bullying, or a bully-victim) on the development of emotional and behavioral engagement. Results indicated that all three bullying statuses negatively predicted emotional school engagement, but only the status of being a bully negatively predicted behavioral engagement.

Resilience Framework

From a resilience framework, school engagement is commonly viewed as the resilient response to bullying victimization. Resilience is defined as "a dynamic process encompassing positive adaptation within the context of significant adversity"

(Luthar, Cicchetti, & Becker, 2000, p. 543). It also is viewed as an integral part of normal development, applicable in both adversarial and adaptive circumstances (Masten, 2001; Masten & Powell, 2003). Different from a risk framework, which focuses on the negative outcomes resulting from bullying victimization, a resilience framework focuses on the intrinsic and extrinsic strengths that empower children and adolescents to overcome adversity and pursue more constructive behaviors (Donnon & Hammond, 2007; Fergus & Zimmerman, 2005). Thus, it provides researchers with a framework to understand how protective factors, both internal and external to the individual, prevent negative outcomes (Donnon, 2010). As for the association between bullying victimization and school engagement, resilience theory highlights the potential value of multilevel moderators in preventing negative outcomes. That is, research guided by resilience theory identifies positive personal factors at the individual level (e.g., sense of self-concept, self-control, empowerment, and social and cultural sensitivity) and factors beyond the individual, such as at the classroom, school, and home levels, which might explain how students respond to and cope with bullying. Moreover, resilience theory illustrates cycles of ongoing engagement that create a motivational context that shapes how students deal with everyday difficulties, challenges, and obstacles in school.

Bullying Victimization and School Engagement: The Main Effects and Moderation Effects of School Climate and Social-Emotional Learning

As seen above, multiple factors at both the individual level (i.e., gender, race-ethnicity, grade level, and a student's social-emotional and social-cognitive functioning) and at the school level (i.e., the socioeconomic status of a school's student body, school size and racial/ethnic diversity of the school's student body) have been shown to relate to school engagement, and to moderate outcomes of bullying

victimization. Because many of these factors are demographic in nature, they are difficult to target and modify in school-based intervention programs (Elias & Moceri, 2012). Others, however, are more malleable, and thus are often targeted for intervention. This is seen in two interrelated contexts for promoting school engagement and social and emotional competence and for preventing bullying and other behavior problems. These two contexts are school climate and the social and emotional learning (SEL) approach to preventing behavior problems and promoting positive youth development. Both contexts are described below.

School Climate

Although the influence of school climate on student learning and social-emotional development has been recognized for well over a century, the systematic empirical study of school climate was not undertaken until the 1950s (Anderson, 1982; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). Since then, research on school climate has expanded greatly and the definition and the theoretical conceptualization of school climate have been widely discussed in the literature (Cohen, McCabe, Michelli, & Pickeral, 2009). In those discussions, positive social relationships in school have consistently been recognized as one of the most important aspects of school climate. For example, Haynes, Emmons, and Ben-Avie (1997) referred to school climate as "the quality and consistency of interpersonal interactions within the school community that influence children's cognitive, social, and psychological development" (p. 322). Adding the importance of safety to the concept of school climate, Cohen, McCabe, Michelli, and Pickeral (2009) defined school

climate as the "quality and character of school life" that includes "norms, values, and expectations that support people feeling socially, emotionally, and physically safe" (p. 182). Research has demonstrated that a positive school climate promotes student learning (Ponitz, Rimm-Kaufman, Grimm, & Curby, 2009) and social-emotional adjustment (Way, Reddy, & Rhodes, 2007; Wilson, 2004) and prevents behavioral problems (Brand, Felner, Shim, Seitsinger, & Dumas, 2003; Claes, Hooghe, & Reeskens, 2009; Kasen, Johnson, & Cohen, 1990; Loukas & Murphy, 2007). For example, Loukas and Robinson (2004) studied the interactive relationships of school climate and effortful control in conduct problems and depressive symptoms among adolescents. In this study, effortful control was defined as "a multidimensional construct that reflects biologically based individual differences in the ability to shift and focus attention and to actively control emotional and attentional responses" (Loukas & Robinson, 2004, p. 212). For male students with low effortful control, they found that those perceiving high levels of cohesion and satisfaction and low levels of friction in their classes reported fewer depressive symptoms. For female students with low effortful control, they found that those perceiving low levels of friction or competition among students reported fewer conduct problems. In general, it is recognized that a favorable school climate, as seen in positive peer relationships and teacher-student relationships, minimizes chances of confrontation and aggressive behaviors among peers as well as peer rejection (Loukas & Murphy, 2007).

In the growing body of school climate studies, the positive effects of social aspects of school climate, particularly positive teacher-student relationships and student-student relationships, have been highlighted (Brand et al., 2003; Fredricks et al., 2004; Hughes, Cavell, & Willson, 2001). This includes the role of climate in school engagement and bullying (Gregory & Cornell, 2009). In the following two sections, studies examining the effects of teacher-student relationships and student-student relationships on school engagement and their moderation effects in the association between bullying victimization and school engagement are reviewed.

Teacher-student relationships. Much of the research on teacher-student relationships has been grounded in attachment theory (Bowlby, 1982), including recent extensions of the core elements of earlier versions of the theory (Kremer, 2010; Pianta, 1999). Those extensions assert that teacher-student relationships closely mirror parent-child relationships. As such, students who are securely attached to their parents are likely to form and maintain similar positive and caring relationships with teachers, whereas students with insecure attachments to their parents and primary caregivers are likely to have negative and distrustful relationships with their teachers (Pianta, 1999). Positive teacher-student relationships thus serve as a secure base from which children can explore the school environment and become engaged in learning activities (Kremer, 2010). The security base also protects students from risk behaviors at school. In contrast, negative teacher-student relationships reflect a lack of security and can hamper children's attempts to cope with the social and academic demands of school. Negative teacher-student relationships also attenuate or exacerbate children's risk for victimization and its harmful consequences.

Empirically, ample studies have consistently supported the notion that teachers' positive relationships and interactions with students play an important role in shaping students' engagement, and that they do so across race, ethnicity, and grade level (Brewster & Bowen, 2004; Roorda, Koomen, Spilt, & Oort, 2011; Skinner & Pitzer, 2012; Woolley & Bowen, 2007). For example, results of a recent meta-analysis of 99 studies, which included students from preschool to high school, found medium to large effects of teacher-student relationships on school engagement and that the effects were strongest in the higher grades (Roorda et al., 2011).

In addition to research showing that teacher-student relationships relate directly to engagement, studies have indicated that the teacher-student relationships moderate the association between bullying victimization and students' school engagement and the association between bullying victimization and other social-emotional, behavioral and academic outcomes (Woolley & Bowen, 2007). For example, Woolley and Bowen (2007) found that students who reported supportive relationships with adults in their home, school, and neighborhood reported higher levels of psychological and behavioral engagement in school. Kremer (2010) found that the associations between bullying victimization and student outcomes, including student internalizing problems (e.g., sadness, loneliness, and anxiety) and school attitudes (e.g., avoidance, liking), were exacerbated by conflictual teacher-student relationships. Similarly, Troop-Gordon and Kuntz (2013) found that close and low-conflictual teacher-student relationships reduced the linkage between bullying victimization and school liking, whereas high-conflictual teacher-student relationships amplified the association between bullying victimization and students' sustained and low academic performance.

Student-student relationships. Developmental theories have long held that peers have an important impact on students' attitudes towards school and their behavior (Li et al., 2011; Rubin, Bukowski, Parker, & Bowker, 2008). Relative to the number of studies on the role of adults in student engagement, fewer studies have examined the role of peers (Gest, 2008). Nevertheless, several studies have explained peer influences on school engagement. In a recent longitudinal study that examined the role of peer context in the development of emotional and behavioral school engagement of students from grades six to eight, Li, Lynch, Kalvin, Liu, and Lerner (2011) found that emotional and behavioral engagement was positively predicted by supportive peer relationships and negatively associated with problematic friends. Moreover, they found that the positive influence of peer support on school engagement was stronger when students were older. Thus, the negative influences of associating with problem-behaving friends on school engagement became more detrimental over time.

The influence of peer context in school engagement has been found not only at the level of the immediate peer group, but also at the classroom level. For example, research has indicated that students demonstrate increased academic efficacy when they perceive their classroom environment to be positive, including having mutually respectful interactions with peers (Ryan & Patrick, 2001). In contrast, studies also have shown that students demonstrate lower engagement and less effective learning strategies when they are in classrooms where comparisons of academic performance among peers are encouraged (Ames & Archer, 1988).

Positive peer relations have been found not only to promote school engagement but also to serve a critical function for students who have already experienced mistreatment by peers, including bullying victimization (Schwartz,

Gorman, Dodge, Pettit, & Bates, 2008). Nakamoto and Schwartz (2011) demonstrated that the negative relationship between bullying victimization and school engagement was exacerbated for children with a number of aggressive friends in their classroom, whereas the association between bullying victimization and school engagement was negligible for children with fewer friends, including both aggressive and nonaggressive friends. Similarly, Schwartz et al. (2008) found that the negative association between peer victmization and student academic achievement, as measured by declining grade point average, was greatest among children with aggressive friends. This is consistent with earlier research indicating that friends provide a context for children to develop core self-regulatory skills, which facilitate adjustment at school and engagement in learning despite exposure to stressors (Hartup & Stevens, 1997). In addition to skills in self-regulation, researchers also have noted that friendship may help mitigate negative attitudes toward school by providing children with encouragement, social support, and opportunities for play during the school day (Schwartz et al., 2008).

Social-Emotional Learning Approach

Social and emotional learning (SEL) is defined as "the process of acquiring knowledge, skills, attitudes and beliefs to identify and manage emotions; to care about others; to make good decisions; to behave ethically and responsibly; to develop positive relationship and to avoid negative behaviors" (Elias & Moceri, 2012, p. 424). SEL integrates both competence promotion and a youth development framework to reduce risk factors and foster protective mechanisms for students' positive adjustment (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Within the school context, SEL programming incorporates two sets of educational strategies: (a) the

systematic and quality instruction of SEL skills, and (b) the establishment of a caring and safe learning environment (Collaborative for Academic, Social, and Emotional Learning, 2005; Durlak, Domitrovich, Weissberg, & Gullotta, 2015). The first strategy emphasizes the instruction of five interconnected sets of cognitive, affective, and behavioral skills: self-awareness, self-management, social awareness, relationship skills, and responsible decision making (Durlak et al., 2011). Those SEL skills are directly taught, modeled, practiced, and applied to diverse situations so that students use them as part of their daily repertoire of behaviors. The second strategy, establishing a caring and safe learning environment, emphasizes the importance of warm and supportive teacher-student and student-student relationships. This strategy is consistent with the notion, as discussed previously, that school-based prevention and youth development programs, including the teaching of SEL skills, are most beneficial when they are implemented in the context of a positive and supportive school climate (Collaborative for Academic, Social, and Emotional Learning, 2005; Eccles & Appleton, 2002; Weissberg & Greenberg, 1998; Zins, Weissberg, Wang, & Walberg, 2004). It is here that the context of school climate and the context of the SEL approach are clearly interrelated.

The importance of SEL skills in promoting school engagement and students' resilience to bullying is supported by both theories and empirical research (Deci & Ryan, 1985; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Wigfield, Eccles, & Rodriguez, 1998). Chief among supporting modern theories is self-determination theory (Deci & Ryan, 1985). Self-determination theory asserts that to develop optimally, youth need to feel connected to others and competent in their abilities and view their behavior as self-directed. When children feel that these three social and emotional needs are met, they are more likely to show positive engagement

in school. The SEL approach also is supported by social-cognitive theory and research on positive youth development, positive psychology, and developmental psychology, particularly in the areas of moral and prosocial development, emotion, attachment, peer relations and friendship, self-concept, and motivation (Bear, 2015; Osher, Bear, Sprague, & Doyle, 2010). Nearly all of these theories emphasize the importance of students being active rather than passive learners and the importance of a supportive learning environment.

In addition to theoretical support, there is strong empirical support for the SEL approach in promoting school engagement and students' resilience. Results of a meta-analysis of 213 school-based, universal SEL studies, which included 270,034 kindergarten through high school students, showed that students in SEL programs, compared to those in programs of "proactive as usual," demonstrated significantly greater social-emotional competencies and attitudes about self, others, and school (Durlak et al., 2011). SEL programs also were found to enhance students' behavioral adjustment, including increased prosocial behavior and to reduce conduct and internalizing problems and improved academic performance on achievement tests and grades (Durlak et al., 2011). Effects in those areas remained statistically significant for a minimum of six months after intervention.

Bullying Victimization and School Engagement: A Multilevel Investigation

As reviewed in the previous sections, multiple factors at both the individual level (i.e., gender, race-ethnicity, grade level, and social-emotional competency) and the school level (i.e., the SES of its student body, school size and racial/ethnic diversity of its student body) have been shown to predict school engagement and to moderate additional outcomes of bullying victimization. Although research in the

domains of school climate and SEL has identified the critical roles of teacher-student relationships and student-student relationships and the teaching of SEL skills in preventing bullying victimization and promoting school engagement, most of these studies have focused on the influences of relationships and SEL skills at the individual level. Rarely have they examined the effects at the school level or across both the individual and school levels. A multilevel approach is needed to best understand the effects of the above factors on school engagement and in the association between bullying victimization and school engagement. A more detailed justification for using a multilevel approach to investigate school engagement and its association with bullying victimization follows.

The multilevel approach to research is consistent with the most prevalent developmental theory commonly used to understand bullying and engagement – social-ecological theory (Espelage & Swearer, 2003, 2004). According to social-ecological theory, bullying does not occur in isolation, but it is a phenomenon that is fostered and/or inhibited as a result of complex relationships between the individual and his or her family, peer group, school, community, and culture (Espelage & Swearer, 2004). The multilevel approach is also consistent with a developmental and contextual perspective, which emphasizes that child development outcomes cannot be fully accounted for by the independent or additive effects of either individual or contextual factors (Lerner, 2002). Instead, child development outcomes are the result of the multiplicative or interactive results of individual differences and contextual factors (Lerner, 2002).

The multilevel approach to research also is consistent with the whole school approach to school intervention and school reform (Durlak et al., 2011). As for bullying intervention, the whole-school approach views bullying as a systematic

problem, requiring multiple and complementary interventions that target the individual, peer groups, classrooms, teachers, and administrators (Vreeman & Carroll, 2007). The empirical effectiveness of the whole-school approach has been supported by a broad range of high-quality SEL programs, in which the instruction of SEL skills are embedded within safe, caring, well-managed and cooperative classroom environments, as well as wider settings that provide equitable opportunities for positive participation and recognition (Durlak et al., 2011).

In the current study, in addition to the demographic factors at the student and school levels the association between bullying victimization and school engagement, at both the student and school levels, and the multilevel main effects of three main aspects of the SEL approach on school engagement are examined. The three main aspects are (a) students' perceptions of teacher-student relationships, (b) students' perceptions of student-student relationships, and (c) students' perceptions of the degree to which SEL skills are taught by their teachers. These three aspects were chosen as core variables representing the SEL approach because they align well with the two main educational strategies incorporated in school-based SEL programming: fostering students' social-emotional competence through systematic instruction and establishing a positive school environment (Collaborative for Academic, Social, and Emotional Learning, 2005; Durlak et al., 2015). Teacher-student and student-student relationships, measured as school climate factors, reflect both individual students' personal perceptions of their relationships with teachers and students and their shared perceptions of their relationships with teachers and students in their schools. The hypothesized model guiding the study is illustrated in Figure 1. The instructional component in the SEL approach is important in that it entails more than a set of skills; it implies the pedagogy for building those SEL skills and an intervention structure to

support the internalization and generalization of the skills over time and across contexts (Elias & Moceri, 2012). As noted by Durlak et al. (2011), in addition to attending to individual person-centered factors it is important to attend to instructional, interpersonal, and environmental factors when explaining the positive outcomes of SEL programs.

Main Research Questions

As shown in this chapter, school engagement is widely viewed as one of most important outcomes of bullying victimization. Whereas the association between bullying victimization and school engagement is supported by research following both risk and resilience frameworks, it is not clear why some victimized students manage to be engaged in school and even thrive after bullying while others disconnect from school. As such, several questions remain: What factors protect students from becoming disengaged in school even though they are bullied by their peers? What factors promote students' resilience to bullying victimization, especially their engagement in school?

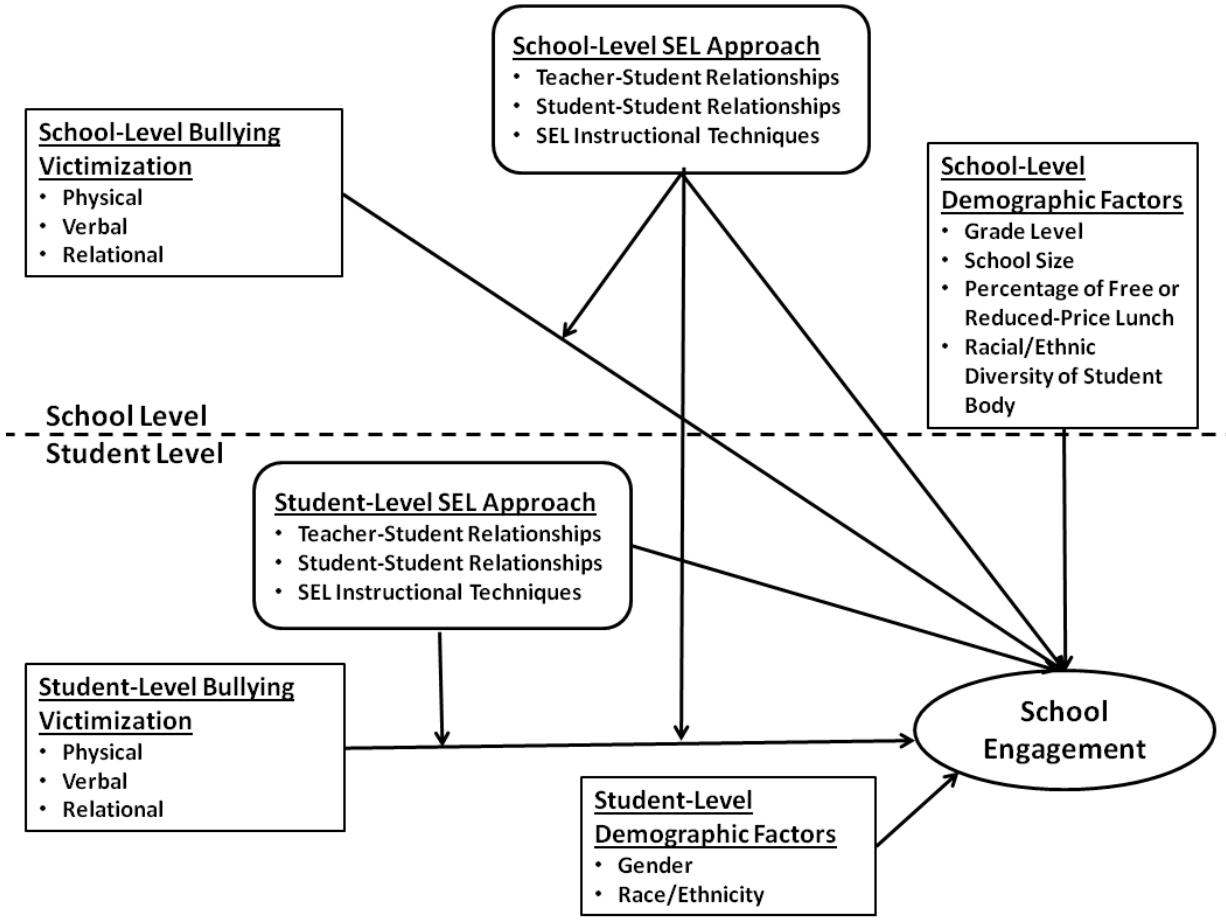

Figure 1 The Hypothesized Model

To answer the questions above, the present study examined the main effects of the following on school engagement: (a) student and school demographic factors; (b) students' perceptions of bullying victimization; and (c) students' perceptions of the SEL approach in their school, which is represented by students' perceptions of the teacher-student relationships, student-student relationships, and teachers' use of SEL techniques. This study also examines the moderation effects of the SEL approach in the association between bullying victimization and school engagement. More specifically, the study is designed to answer the following three main research questions[1]:

(1) What are the effects of student-level demographic factors (i.e., gender and race) and school-level demographic factors (i.e., grade level, school size, percentage of students receiving free or reduced-price lunch, racial/ethnic diversity index) on students' perceptions of school engagement?

(2) Do students' perceptions of bullying victimization, teacher-student relationships, student-student relationships, and teachers' use of SEL instructional techniques have significant effects on students' perceptions of school engagement at the student and school levels when individual-level and school-level demographic factors are statistically controlled?

(3) Does the SEL approach, which is represented by teacher-student relationships, student-student relationships, and teachers' use of SEL instructional techniques,

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[1] The term "effects" in this study is employed similarly to the same term from the previous literature. Whereas they do not reflect purely causal impacts (i.e., as that from a well-controlled experiment), they are suggestive of potential causal relationships.

moderate the association between students' perceptions of bullying victimization and school engagement when individual-level and school-level demographic factors are statistically controlled?

Chapter 2

METHOD

As presented in the previous chapter, this study had three main goals: (a) to examine the main effects of student-level and school-level demographic factors on school engagement, (b) to examine the multilevel main effects of students' perceptions on bullying victimization, teacher-student relationships (TS), student-student relationships (SS), and teachers' use of SEL instructional techniques (SEL_I) on school engagement, and (c) to examine the multilevel moderation effects of the TS, SS, and SEL_I in the association between bullying victimization and school engagement. To achieve these three goals, a cross-sectional design was used to analyze survey data collected in Delaware public schools. In the following sections, the data collection procedures, participants, measures, and data analytic procedures are described.

Data Collection Procedures

Since the 2004–2005 school year, the Delaware Positive Behavioral Support (DE–PBS) project at the University of Delaware's Center for Disabilities Studies has developed the Delaware School Surveys and coordinated their state-wide administration each year. This includes the Delaware School Survey–Student (DSS–S), which is administered to students in grades 3-12. The project is funded by the Delaware Department of Education. The DSS–S has been revised and updated periodically based on the feedback from participating schools, requests for additions

from the Delaware Department of Education, and results of psychometric studies, including confirmatory factor analyses (Bear, Gaskins, Blank, & Chen, 2011; Bear et al., 2014). In this study, data from the 2013 administration of the survey were analyzed. The 2013 DSS–S includes four scales. The first scale, the Delaware School Climate Scale–Student (DSCS–S), is designed to measure students' perceptions of the social structure (e.g., rules) and social support (e.g., relationships) within their school. It includes eight subscales: Teacher-Student Relations, Student-Student Relations, School Safety, Clarity of Expectations, Fairness of School Rules, Respect for Diversity, School-wide Bullying, and School-wide Engagement. The second scale, the Delaware School Disciplinary Techniques Scale–Student (DSDTS–S), consists of three subscales designed to measure students' perceptions of teachers' use of three common types of classroom and school discipline techniques: positive (e.g., praise and rewards), punitive (e.g., classroom removal), and social and emotional learning (SEL) (e.g., teaching empathy and responsibility). The third scale, Delaware School Engagement Scale–Student (DSES–S), is an 11-item scale designed to measure students' perceptions of being involved, committed, or invested in cognitive/behavioral and emotional aspects of schooling. Finally, the fourth scale is the Delaware Bullying Victimization Scale–Student (DBVS–S), which is designed to measure students' perceptions of the degree to which they perceive being victims of 12 bullying behaviors. It includes three subscales: Physical Bullying Victimization, Verbal Bullying Victimization, and Relational Bullying Victimization. The surveys are offered in a paper format, using a Scantron form, and an online format, using survey administration software Survey Monkey © (1999–2011).

In the fall of 2012, staff from the DE–PBS project sent an electronic request to all Delaware public schools inviting them to participate in administration of the school climate survey. In response, 153 regular public schools (i.e., elementary, middle and high schools), excluding charter, alternative, and other schools, completed the survey in January or February 2013. Educators from each school were responsible for sampling and survey administration. The DE–PBS project provided written instructions outlining how many students should be surveyed (e.g., all students in elementary schools and at least 50% of students in secondary schools) and suggesting methods for randomly selecting students from each grade level to ensure a representative student sample. Prior to completing the survey, educators were asked to inform students of the purpose of the survey and assure them of confidentiality. Educators were encouraged to read the directions and the survey items to students with reading difficulties, especially those in elementary school or reading below the third-grade level. The study was approved by the University's Institutional Review Board and was granted exempt status. The approval letter from the University's Institutional Review Board is presented in Appendix A.

Participants

The original dataset included a total of 37,914 respondents: 34,365 students in 135 regular public schools and 3,549 students in 18 other schools (e.g., charter, alternative, special schools, and specialized schools in art/science). The following five criteria were used to select the student and school samples for the study: (a) students attended 4th through 12th grade; (b) students responded to at least one of the items on each of the five scales used in the study; (c) students identified their gender and race/ethnicity on the survey; (d) schools were regular public schools and not charter

schools, alternative schools, special schools, or other specialized schools such as art/science schools or vocational schools; (e) the school's profile information was published on the website of Delaware Department of Education, and (f) at least 40 students in the school completed the surveys.

After the initial selection of eligible students and school from the original dataset, three middle schools serving grades 5-6 (total number of participants = 605) and one middle school serving grades 5-8 (total number of participants = 228) were deleted because their grade configurations were different from those of other schools (i.e., grades 1-5/K-5 for elementary school, grades 6-8 for middle school, and grades 9-12 for high school). Although the grade configuration of the middle school serving grades 5-8 was somewhat similar to that of the other 6-8 middle schools, an independent sample *t* test showed that students' perceptions of school engagement and relational bullying in the grade 5-8 school was significantly different from those of students in 6-8 middle schools. These results were found after removing students in fifth grade.

After the above five criteria were applied to the original dataset and the four schools with uncommon grade configurations were deleted, the final sample consisted of 25,896 4th through 12th grade students enrolled in 71 elementary schools ($n_{students}$ = 9,659), 26 middle schools ($n_{students}$ = 9,535), and 17 high schools ($n_{students}$ = 6,702). Response rates of schools were calculated based on the percentage of eligible students enrolled and those who responded to at least one item on each of the five scales of the DSC-S. Eligible students referred to the number of students, grades 4-12, who were enrolled in a given school during the 2012-2013 school year. Response rates of the final sample ranged from 15.66% to 98.82% (mean = 62.32%, median = 73.03%,

average number of respondents in each school = 229). The response rates ranged from 29.88% to 98.82% for elementary schools (mean = 74.60%, median = 79.00%, average number of respondents in each school = 136), 23.93% to 79.29% for middle school students (mean = 46.65%, median = 42.24%, average number of respondents in each school = 366), and 15.66% to 66.15% for high school students (mean = 38.11%, median = 36.35%, average number of respondents in each school = 394). In the final sample, missing responses to individual survey items ranged from 0.1% to 1.2%. Missing responses to composite scores ranged from 1.2% to 4.4%. Demographic information for the final student and school samples are presented in Table 1.

Measures

Data were obtained from the following scales and subscales: the Delaware Bullying Victimization Scale–Student (DBVS–S), including all three subscales (i.e., Physical Bullying Victimization [PBV], Verbal Bullying Victimization [VBV], Relational Bullying Victimization [RBV]); the Delaware School Engagement Scale–Student (DSES–S); Teacher-Student Relationships and Student-Student Relationships subscales of the Delaware School Climate Scale–Student (DSCS–S); and the SEL Instructional Techniques subscale of the Delaware School Disciplinary Techniques Scale–Student (DSDTS–S). Students' demographic information (i.e., gender, race/ethnicity, and grade) also was collected from the DSS–S. Schools' demographic information was gathered from the Delaware Department of Education School Profiles webpage. The items included in the scales and subscales used in the study are presented in Appendix B. The psychometric properties of the above scales and the descriptions of the student- and school-level demographic factors, are described below.

Table 1 **Demographic Information for Student and School Participants in the Final Student and School Samples**

Student Participants								
	Elementary		**Middle**		**High**		**Total**	
	n	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Full Sample	9,659	37.30%	9,535	36.82%	6,702	25.88%	25,896	100%
Gender								
Male	4,718	37.53%	4,738	37.69%	3,114	24.77%	12,570	49%
Female	4,941	37.08%	4,797	36.00%	3,588	26.92%	13,326	51%
Race/Ethnicity								
Caucasian	4,538	38.59%	4,304	36.60%	2,919	24.82%	11,761	45.42%
African-American	2,216	34.80%	2,296	36.06%	1,856	29.15%	6,368	24.59%
Hispanic/Latino	1,511	40.06%	1,343	35.60%	918	24.34%	3,772	14.57%
Asian	350	38.04%	335	36.41%	235	25.54%	920	3.55%
Other Race/Ethnicity	1,044	33.95%	1,257	40.88%	774	25.17%	3,075	11.87%

School Participants				
	Elementary	**Middle**	**High**	**Total**
Full School Sample	71	26	17	114
Racial/Ethnic Proportionality				
Caucasian	42.72%	45.86%	45.54%	44.71%
African-American	31.03%	32.38%	36.55%	33.32%
Hispanic/Latino	19.28%	16.05%	13.62%	16.32%
Asian	3.67%	3.07%	2.69%	3.14%
Indian-American	0.41%	0.36%	0.41%	0.39%
Hawaiian	0.07%	0.06%	0.07%	0.07%
Other Race/Ethnicity	2.82%	2.22%	1.11%	2.05%
Percentage of Students Receiving FRL	60.07%	55.47%	53.62%	56.39%
School Size	540	767	1106	804

Bullying Victimization

The DBVS–S (Bear et al., 2014) consists of 12 items that assess individual students' perception of the frequency with which they perceive 12 bullying behaviors to have occurred "during this school year." Items were adapted from the Adolescent Peer Relations Instrument: Bully/Target (Marsh et al., 2011; Parada, 2000). The scale includes three subscales. Items are shown in Appendix B. Students are asked to report how often they have been victims of the given bullying behavior "since you have been at this school this school year (since September)." They respond using a 6-point Likert scale, with 1 = *Never,* 2 = *Sometimes,* 3 = *Once or Twice a Month,* 4 = *Once a Week,* 5 = *Several Times a Week,* and 6 = *Everyday.* As reported in the technical manual for the DBVS–S (Bear, et al., 2014), results of confirmatory factor analyses demonstrated that the DBVS–S is best represented by a three-factor model (χ^2 = 1574.17(51, N =13,422), $p < .001$; CFI = .956, RMSEA = .030, and SRMR = .047). Configural, weak, and strong factorial invariance were found across three grade levels (elementary, middle, and high school), gender, and racial-ethnic groups (i.e., Caucasian, African-American, Hispanic/Latino, Asian, and Other race/ethnicity including multi-race/ethnicity).

The 12 items were added together to create one overall bullying victimization (OBV) score. Three separate subscale scores also were calculated by summing item scores on each subscale: PBV, VBV, and RBV. Higher scores represent more frequent bullying victimization in the school. The reliability coefficients for the OBV scores were .95 for all students combined, .94 for elementary school students, .95 for middle school students, and .96 for high school students. For PBV scores, the reliability coefficients were .86 for all students combined, .84 for elementary school students, .85

for middle school students, and .89 for high school students. For VBV scores, the reliability coefficients were .92 for all students combined, .90 for elementary school students, .92 for middle school students, and .93 for high school students. For RBV scores, the reliability coefficients were .90 for all students combined, .89 for elementary school students, .91 for middle school students, and .92 for high school students.

School Engagement

The DSES–S (Bear et al., 2014) consists of 11 items that assess students' perceptions of their experience of being involved, committed, or invested in cognitive/behavioral and emotional aspects of schooling. Items are consistent with Finn and Voelkl's (1993) two-dimensional perspective of school engagement, in which behavioral and emotional engagement are viewed as proximal outcomes related to bullying victimization and cognitive engagement is reviewed as a more distal outcome of bullying victimization and more related to the academic achievement. Students respond to items using a 4-point Likert scale, with 1 = *Disagree a Lot,* 2 = *Disagree,* 3 = *Agree,* and 4 = *Agree a Lot.* Results of confirmatory factor analysis, as reported in the technical manual for the DSES–S (Bear et al., 2014) demonstrated that the DSES–S is best represented by a bifactor model with a general factor of school engagement and two specific factors of behavioral/cognitive engagement and emotional engagement [χ^2 = 289.785 (18, N = 17,140), p < .001; CFI = .991, RMSEA = .030, and SRMR = .011]. Configural, weak, and strong factorial invariance were found across three grade levels (elementary, middle, and high school), gender, and racial-ethnic groups (i.e., Caucasian, African-American, Hispanic/Latino, Asian, and Other race/ethnicity including multi-race/ethnicity).

For the purpose of the current study, only the mean of the total composite score of school engagement was used, consisting of the mean of the scores of the 11 items. Higher scores reflect greater school engagement. Reliability coefficients for composite scores were .88 for all students combined, .86 for elementary school students, .87 for middle school students, and .84 for high school students.

Teacher-Student Relationships

The 4-item Teacher-Student Relations subscale of the DSCS–S (Bear et al., 2011; Bear et al., 2014) assesses students' perceptions of the quality of interactions between adults and students in the school, such as teachers' caring about and listening to their students. Students respond using a 4-point Likert scale, with 1 = *Disagree a Lot,* 2 = *Disagree,* 3 = *Agree,* and 4 = *Agree a Lot.*

Results of confirmatory factor analyses, as reported in the technical manual for the DSCS–S (Bear et al., 2014) demonstrated that the scale is best represented by a bifactor model with a general factor of school climate and eight specific factors [χ^2 = 9140.40 (373, N =17,140), $p < .001$; CFI = .926, RMSEA = .037, and SRMR = .048]. The eight specific factors are Teacher-Student Relations, Student-Student Relations, School Safety, Fairness of School Rules, Clarity of Expectations, Respect for Diversity, School-wide Engagement, and School-wide Bullying. Configural, weak factorial and strong factorial invariance were found across gender, grade level (i.e., elementary, middle, and high), and race/ethnicity (i.e., Caucasian, African-American, Hispanic/Latino, Asian, and Other race/ethnicity including multi-race/ethnicity). Higher ratings on the Teacher-Student Relations subscale reflect more favorable perceptions. In the current study, scores on the Teacher-Student Relationships subscale had reliability coefficients of .86 for all students combined, .80 for

elementary school students, .85 for middle school students, and .83 for high school students.

Student-Student Relationships

The 4-item Student-Student Relations subscale of the DSCS–S (Bear et al., 2011; Bear et al., 2014) taps students' perceptions of the quality of interactions among students, such as peers showing friendliness, caring, and respect. Students respond using a 4-point Likert scale, with 1 = *Disagree a Lot,* 2 = *Disagree,* 3 = *Agree,* and 4 = *Agree a Lot.* Higher scores reflect more favorable perceptions. Scores for the Student-Student Relationships subscale were found to have reliability coefficients of .86 for all students combined, .86 for elementary school students, .85 for middle school students, and .84 for high school students.

Teachers' Use of SEL Instructional Techniques

The 5-item SEL Instruction subscale of the DSDTS–S measures students' perceptions of the use of SEL instructional techniques by their teachers and other school staff. These items refer to the techniques that educators use to encourage students to feel responsible for and in control of their behavior, consider others' perspectives, feel empathy, and resolve conflicts; thus, promoting social-emotional development, moral reasoning, and self-discipline (Bear et al., 2011, Bear, 2015). Students respond using a 4-point Likert scale, with 1 = *Disagree a Lot,* 2 = *Disagree,* 3 = *Agree,* and 4 = *Agree a Lot.* The DSDTS–S was found to be best represented by a three-factor model [χ^2 = 2706.72 (62, N =17,138), $p < .001$; CFI = .925, RMSEA = .050, and SRMR = .054], with configural, weak and strong factorial invariance found across three grade levels (elementary, middle, and high school), gender, and racial-

ethnic groups (i.e., Caucasian, African-American, Hispanic, Asian, and Other race/ethnicity including multi-race/ethnicity). Higher ratings on the use of the SEL Instruction subscale reflect greater use of SEL techniques in the school. Scores on the 5-item SEL Instruction subscale were found to have reliability coefficients of .86 for all students combined, .81 for elementary school students, .84 for middle school students, and .84 for high school students.

Student-Level Demographic Factors

As indicated previously, items on the Delaware surveys ask students to identify their gender (i.e., boy and girl), race-ethnicity (i.e., African-American, Caucasian, Hispanic/Latino, Asian, and Other race/ethnicity including multi-race/ethnicity), and grade (i.e., grade 3-12). The two categories of students' gender were coded as one dummy variable (i.e., Gender_D1 and Gender_D2), with male students being chosen as the comparison reference group. The one dummy variable also was centered on the group means (i.e., school means) prior to inclusion in the hierarchical linear regression models. The five categories of students' race/ethnicity were coded as four dummy variables (i.e., Race/Ethnicity_D1, Race/Ethnicity_D2, Race/Ethnicity_D3 and Race/Ethnicity_D4), with African American students chosen as the comparison reference group. Choosing African American students as the comparison reference group was based on previous research findings that African American students tend to show less school engagement, compared to other racial/ethnic groups, as reviewed earlier.

School-Level Demographic Factors

For all schools, school-level demographic data were gathered from the Delaware Department of Education School Profiles webpage (http://profiles.doe.k12.de.us/schoolprofiles/State/Default.aspx). These data included school size, grades served by each school, the percentage of students receiving free or reduced-price lunch (FRL), and the percentage of students in each racial/ethnic group (i.e., Caucasian, African-American, Hispanic/Latino, Asian, Hawaiian, American Indian, and Other race/ethnicity including multi-race/ethnicity).

The school's grade level was coded into three categories (i.e., elementary, middle, and high school) based on the grade configuration of the school. The three categories of schools' grade levels were then coded as three dummy variables (i.e., Grade Levels_D1, Grade Levels_D2, and Grade Levels_D3), with middle schools chosen as the comparison reference group. The three dummy variables were then centered on the grand means of all schools prior to inclusion in the hierarchical linear regression models. School size was measured by the total number of students enrolled in the school year 2012-2013. The school's percentage of students receiving free or reduced-price lunch (FRL) was used to measure the SES of the student body in the school. In order to meaningfully interpret the effect of the schools' percentage of students receiving FRL on school engagement, the variable of the schools' percentage of students receiving FRL was rescaled so that 1 unit of this variable was equal to 10 percentage points. The school size and school's percentage of students receiving FRL were centered by the grand means of all schools prior to inclusion in the hierarchical linear regression models.

Based on the information about each school's percentage of students in each racial/ethnic category, a racial/ethnic diversity index was calculated using the formula

of Simpson's Diversity Index (Coulter, 1989). The racial/ethnic diversity index refers to the probability that the next person you encounter is a different race/ethnicity from the one that was just seen (Coulter, 1989). The formulation for Simpson's Diversity Index is: 1 - (Percentage of same race) = 1 - [(Percentage of Caucasian)2 + (Percentage of African-American)2 + (Percentage of Hispanic/Latin)2 + (Percentage of Asian)2 + (Percentage of Indian American)2 + (Percentage of Hawaii)2 + (Percentage of Other Race/Ethnicity including Multi-race/ethnicity)2].

Procedures for Statistical Analyses

Before investigating the three main research questions guiding the study, descriptive relationships (e.g., correlational analyses) among the continuous independent variables and dependent variable measured at the student level were first examined using PASW Statistics 22. The continuous independent variables measured at the student level were (a) bullying victimization, which included overall bullying victimization (OBV) and each of the three subtypes of bullying victimization: physical (PBV), verbal (VBV), and relational bullying victimization (RBV), and (b) three factors that represented the SEL approach: teacher-student relationships (TS), student-student relationships (SS), and use of SEL instructional techniques (SEL_I). The dependent variable measured at the student level was school engagement.

Next, the continuous independent variables measured at the student level (i.e., BV, TS, SS, SEL_I) were aggregated at the school level. The correlations of aggregated school-level continuous independent variables with other continuous independent variables measured at school level were examined. The continuous independent variables measured at the school level were school size, percentage of students receiving free or reduced-priced lunch (FRL), and student racial

diversity index.

Two centering approaches were applied to the independent variables in order to minimize the threat of multicollinearity in the hierarchical linear regression models (Raudenbush & Byrk, 2002). Group mean (school mean) centering was applied to the independent variables reported at the student level to generate student-level predictors (i.e., $OBV_{\text{student level}}$, $PBV_{\text{student level}}$, $RBV_{\text{student level}}$, $VBV_{\text{student level}}$, $TS_{\text{student level}}$, $SS_{\text{student level}}$, $SEL_I_{\text{student level}}$, Gender, Gender_D1, Gender_D2, Race/Ethnicity_D1, Race/Ethnicity_D2, Race/Ethnicity_D3 and Race/Ethnicity_D4). Grand mean centering was applied to aggregated school-level independent variables and all independent variables reported at the school level to generate school-level predictors (i.e., $OBV_{\text{school level}}$, $PBV_{\text{school level}}$, $RBV_{\text{school level}}$, $VBV_{\text{school level}}$, $TS_{\text{school level}}$, $SS_{\text{school level}}$, and $SEL_I_{\text{school level,}}$ school size, percentage of students receiving FRL, and racial diversity index score of the student body).

After the predictors were centered by the group means or grand means, each type of $BV_{\text{student level}}$ (i.e., $OVB_{\text{student level}}$, $PBV_{\text{student level}}$, $RBV_{\text{student level}}$, and $VBV_{\text{student level}}$) was multiplied with each of the three student-level factors representing the SEL approach (i.e., $TS_{\text{student level}}$, $SS_{\text{student level}}$, and $SEL_I_{\text{student level}}$) to generate three sets of student-level interaction terms (i.e., $BV_{\text{student level}} \times TS_{\text{student level}}$, $BV_{\text{student level}} \times SS_{\text{student level}}$, and $BV_{\text{student level}} \times SEL_I_{\text{student level}}$). Each type of $BV_{\text{school level}}$ (i.e., $OVB_{\text{school level}}$, $PBV_{\text{school level}}$, $RBV_{\text{school level}}$, and $VBV_{\text{school level}}$) was multiplied with each of the three school-level factors related to the SEL approach (i.e., $TS_{\text{school level}}$, $SS_{\text{school level}}$, and $SEL_ISEL_I_{\text{school level}}$) to generate three sets of school-level interaction terms (i.e., $BV_{\text{school level}} \times TS_{\text{school level}}$, $BV_{\text{school level}} \times SS_{\text{school level}}$, and $BV_{\text{school level}} \times SEL_I_{\text{school level}}$). The student-level and school-level interaction terms were generated to examine

the student and school moderation effects of TS, SS, and SEL_I in the association between bullying victimization and school engagement. The interpretations of these interaction terms will be discussed in detail in the results section.

Finally, after all the predictors were group mean-centered or grand mean-centered and after the student-level and school-level interaction terms were generated, four sets of seven hierarchical linear regression models were specified using the HLM 7.0 to examine the three main research questions: (a) the main effects of demographic factors at the student level (i.e., gender and race/ethnicity) and school level (i.e., school size, percentage of students receiving FRL, and racial/ethnic diversity index) on school engagement, (b) the multilevel main effects of bullying victimization (i.e., OBV, PBV, VBV, and RBV), TS, SS, and SEL_I on school engagement, and (c) the multilevel moderation effects of TS, SS, and SEL_I in the association between bullying victimization (i.e., OBV, PBV, VBV, and RBV) and school engagement. The variables included in the four sets of seven models are presented in Table 2. As shown in the table, the variables included in each set of the seven models are identical except for the variables of bullying victimization. Each set of models addressed the three main research questions related to each type of bullying victimization by including one type of bullying victimization (i.e., OBV, PBV, VBV, and RBV) into each set of seven models. Within each set of models, student-level, school-level and cross-level predictors and moderators were sequentially added into the models from Model 1 to Model 7 following the same order across the four sets of models. Instead of entering the variables simultaneously in one model, they were entered sequentially because this method is helpful in examining the individual effects of the different sets of variables (i.e., demographic factors, main effects and moderation effects). It also is helpful in

Table 2 Variables Included in the Four Sets of Hierarchical Linear Regression Models

	1	2	3	4	5	6	7
Intercept of School Engagement Outcome	X*[a]	X[b]	X	X	X	X	X
Student-Level Main Effects							
Gender							
Differences Between Male and Female Student		X*	X	X	X	X	X
Race							
Difference Between Hispanic and African-American Students		X*	X	X	X	X	X
Difference Between Caucasian and African-American Students		X*	X	X	X	X	X
Difference Between Asian and African-American Students		X*	X	X	X	X	X
Difference Between Multi-racial and African-American Students		X*	X	X	X	X	X
Bullying Victimization (BV): OBV/PBV/VBV/RBV			X*	X	X	X	X
Teacher-Student Relationships (TS)				X*	X	X	X
Student-Student Relationships (SS)				X*	X	X	X
Teacher's Use of SEL Instructional Techniques (SEL_I)				X*	X	X	X
Student-Level Moderation Effects							
$BV_{student\ level} \times TS_{student\ level}$						X*	X
$BV_{student\ level} \times SS_{student\ level}$						X*	X
$BV_{student\ level} \times SEL_I_{student\ level}$						X*	X

Table 2 Continued.

	1	2	3	4	5	6	7
School-Level Main Effects							
Grade Level							
Difference Between Elementary and Middle Schools		X*	X	X	X	X	X
Difference Gap Between High and Middle Schools		X*	X	X	X	X	X
School Size		X*	X	X	X	X	X
Percentage of Students Receiving FRL		X*	X	X	X	X	X
Racial Diversity Index		X*	X	X	X	X	X
Bullying Victimization (BV): OBV/PBV/VBV/RBV			X*	X	X	X	X
TS					X*	X	X
SS					X*	X	X
SEL_I					X*	X	X
School-Level Moderation Effects							
$BV_{\text{school level}} \times TS_{\text{school level}}$							X*
$BV_{\text{school level}} \times SS_{\text{school level}}$							X*
$BV_{\text{school level}} \times SEL_{\text{school level}}$							X*
Cross-Level Moderation Effects							
$BV_{\text{student level}} \times TS_{\text{school level}}$							X*
$BV_{\text{student level}} \times SS_{\text{school level}}$							X*
$BV_{\text{student level}} \times SEL_I_{\text{school level}}$							X*

Note: [a]X* refers to variable(s) newly added into the current models;
[b]X refers to variable(s) added in the previous models.

avoiding problems with confounding or collinearity among predictors. In the four sets of models, Model 1 and 2 were identical across the four sets because the questions addressed by Model 1 and 2 were not related to the specific types of bullying victimization, and variables related to different types of bullying victimization were added into the model starting from Models 3.

Before examining the three specific research questions, an unconditional model (Model 1) with school engagement as the outcome variable and no predictors was specified to estimate the intraclass correlation coefficient (ICC). ICC was used to represent the proportion of variance in school engagement explained at both the student and school levels and to determine if multilevel analysis was appropriate.

To examine the first research question, four identical Models 2 were specified to concurrently examine the student-level and school-level main effects of demographic factors on school engagement. The student-level demographic factors include gender and race and the school-level demographic factors include grade levels, school size, percentage of students receiving FRL, and the racial diversity index on school engagement. To examine the second research question regarding the multilevel main effects of BV, TS, SS, and SEL_I on school engagement, four sets of hierarchical linear regression models (i.e., four sets of Models 3-5) were specified.

Four sets of Models 3 were specified to examine the main effects of each type of bullying victimization on school engagement, with the main effects of student- and school-level demographic factors on school engagement controlled. In each set of Models 3, the student- and school-level demographic factors added in Model 2 were kept in the models; each type of $BV_{\text{student level}}$ was added as a student-level predictor and each type of $BV_{\text{school level}}$ was added as a new school-level predictor.

Four sets of Models 4 examined the concurrent main effects of TS, SS, and SEL_I on school engagement at the student level, with the main effects of student- and school-level demographic factors and BV on school engagement controlled. In Models 4, all of the predictors in Models 3 were included in the models, and $TS_{\text{student level}}$, $SS_{\text{student level}}$ and $SEL_I_{\text{student level}}$ were added as new student-level predictors.

Four sets of Models 5 examined the multilevel main effects of each type of BV, TS, SS, and SEL_I on school engagement at both the student and school levels, with student and school demographic factors controlled at both the student and school levels. In Models 5, all of the predictors in Models 4 were kept in the models, and $TS_{\text{school level}}$, $SS_{\text{school level}}$, and $SEL_I_{\text{school level}}$ were added as school-level predictors.

The third research question was aimed to examine the multilevel moderation effects of TS, SS, and SEL_I in the association between bullying victimization and school engagement. Two different sets of hierarchical linear regression models (i.e., four sets of Models 6-7) were specified for the examination of the third research question. Four sets of Models 6 examined the student-level moderation effects of TS, SS, and SEL_I in the association between each type of BV and school engagement. In Models 6, the effects of student and school demographic factors and the multilevel main effects of BV, TS, SS, and SEL_I on school engagement were controlled. In Models 6, all of the predictors in Models 5 were kept in the models and the three student-level interaction terms (i.e., $BV_{\text{student level}} \times TS_{\text{student level}}$, $BV_{\text{student level}} \times SS_{\text{student level}}$, and $BV_{\text{student level}} \times SEL_I_{\text{student level}}$) were added as student-level predictors.

Four sets of Models 7 examined the school-level and cross-level moderation effects of TS, SS, and SEL_I in the association between each type of bullying victimization and school engagement, with student and school demographic factors,

and the multilevel main effects of BV, TS, SS, and SEL_I on school engagement controlled. In Models 7, all of the predictors in Models 6 were included in the models, and the three school-level interaction terms (i.e., $BV_{\text{school level}} \times TS_{\text{school level}}$, $BV_{\text{school level}} \times SS_{\text{school level}}$, and $BV_{\text{school level}} \times SEL_I_{\text{school level}}$) were added as new school-level predictors. In order to examine the cross-level moderation effects of school-level TS, SS, and SEL_I in the student-level association between BV and school engagement, three school-level predictors (i.e., $TS_{\text{school level}}$, $SS_{\text{school level}}$, and $SEL_I_{\text{school level}}$) also were added as predictors to the student-level regression slope between each type of $BV_{\text{student level}}$ and school engagement. This was to create three cross-level moderation terms: $BV_{\text{student level}} \times TS_{\text{school level}}$, $BV_{\text{student level}} \times SS_{\text{school level}}$, and $BV_{\text{student level}} \times SEL_I_{\text{school level}}$.

For illustration, the equations for Models 7 and the symbolic interpretation of each parameter are presented below.

Student-Level (Level-1) Models

$$School_Engagement_{ij} = \beta_{0j} + \beta_{1j}(BV_{ij}) + \beta_{2j}(TS_{ij}) + \beta_{3j}(SS_{ij}) + \beta_{4j}(SEL_{ij}) + \beta_{5j}(TS_{ij} \times BV_{ij}) + \beta_{6j}(SS_{ij} \times BV_{ij}) + \beta_{7j}(SEL_I_{ij} \times BV_{ij}) + \theta_j(Student_Demographics_{ij}) + r_{ij}$$

School-Level (Level-2) Models

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\overline{BV_j}) + \gamma_{02}(\overline{TS_j}) + \gamma_{03}(\overline{SS_j}) + \gamma_{04}(\overline{SEL_I_j}) + \gamma_{05}(\overline{TS_j} \times \overline{BV_j}) + \gamma_{06}(\overline{SS_j} \times \overline{BV_j}) + \gamma_{07}(\overline{SEL_I_j} \times \overline{BV_j}) + \varphi(School_Demographics_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}(\overline{TS_j}) + \gamma_{12}(\overline{SS_j}) + \gamma_{13}(\overline{SEL_I_j}) + u_{1j}$$

$$\beta_{2j} = \gamma_{20} + u_{2j}$$

$$\beta_{3j} = \gamma_{30} + u_{3j}$$

$$\beta_{4j} = \gamma_{40} + u_{4j}$$

$$\beta_{5j} = \gamma_{50} + u_{5j}$$

$$\beta_{6j} = \gamma_{60} + u_{6j}$$

$$\beta_{7j} = \gamma_{70} + u_{7j}$$

$$\theta_j = \gamma_{80} + u_{8j}$$

1) Subscript *i* represents students {1, 2, … n_j} per school, while subscript *j* represents schools {1, 2, … , 114};
2) $School_Engagement_{ij}$ is the outcome variable of School Engagement for student i in school j;
3) β_{0j} is the random intercept for school *j*;
4) β_{1j} is the main effect in school *j* of BV_{ij}, a group-mean centered continuous predictor representing one type of bullying victimization: overall bullying victimization (OBV), physical bullying victimization (PBV), verbal bullying victimization (VBV), and relational bullying victimization (RBV). Only one of these four variables is included in each set of the seven hypothesized models;
5) β_{2j} through β_{4j} are the student-level main effects of TS_{ij}, SS_{ij}, and SEL_I_{ij}, which are group-mean centered continuous predictors representing Teacher-student Relationships (TS), Student-student Relationships (SS), and SEL Instructional Techniques (SEL_I). All three variables are concurrently included in each set of the seven hypothesized models;
6) β_{5j} through β_{7j} are the student-level moderating effects of TS_{ij}, SS_{ij}, and SEL_I_{ij} on the relationship between BV_{ij} and *School _Engagement*;

7) θ_j is a vector of main effects multiplied by a vector of *Student_Demographics*$_{ij}$, which includes individual-level demographic factors such as gender and race/ethnicity. These categorical variables are dummy coded and centered on their school means;
8) r_{ij} is the error term associated with student *i* in school *j* and is assumed to be randomly distributed with a mean of 0 and variance σ^2;
9) γ_{00} is the average group intercept, or predicted grand-mean outcome at the school level in the population;
10) γ_{01} is the main effect on *School_Engagement* by $\overline{BV_j}$, a grand-mean centered continuous predictor representing the school average of one type of bullying victimization (i.e., OBV, PBV, VBV and OBV). Only one of these four variables is included in each set of the seven hypothesized models;
11) γ_{02} through γ_{04} are the school-level main effects on *School_Engagement by* $\overline{TS_j}$, $\overline{SS_j}$, and $\overline{SEL_I_j}$ which are grand-mean centered continuous predictors representing the school averages of the TS, SS, and SEL_I variables. All three variables are concurrently included in each set of the seven hypothesized models;
12) γ_{05} through γ_{07} are the school-level moderating effects of $\overline{TS_j}$, $\overline{SS_j}$, and $\overline{SEL_I_j}$ on the relationship between $\overline{BV_j}$ and *School_Engagement*;
13) φ is a vector of main effects multiplied by a vector of *School_Demographics*$_j$, including school-level school size, grade levels, percentage of students receiving free lunch, and the racial/ethnic diversity index. The categorical variable for grade levels is dummy coded and centered on the grand mean; continuous variables are also centered on grand means;

14) u_{0j} represents the random effect associated with school j, which is assumed to have a mean of 0 and variance of $\tau_{00;}$

15) γ_{10} through γ_{40} are the mean effects of student-level BV_{ij}, $TS_{ij,}$ SS_{ij}, and SEL_I_{ij} averaged across the j schools*;*

16) γ_{50} through γ_{70} are the mean effects of student-level moderation terms $TS_{ij} \times BV_{ij}, SS_{ij} \times BV_{ij}, and\ SEL_I_{ij} \times BV_{ij}$ averaged across the j schools*;*

17) γ_{80} is a cluster of the mean effects of Student_Demographics$_{ij}$ averaged across the j schools*;*

18) γ_{11} through γ_{13} are the cross-level moderating effects of school-level $\overline{TS}_j$, $\overline{SS}_j$, and $\overline{SEL}_I_j$ on the relationship between student-level BV_{ij} and *School_Engagement;*

19) u_{1j} is the random effect for the BV_{ij} slope for school *j;*

20) u_{2j} through u_{4j} are the random effects for the $TS_{ij,}$ SS_{ij}, and SEL_I_{ij} slopes for school *j;*

21) u_{5j} through u_{7j} are the random effects for the slopes of moderation terms $TS_{ij} \times BV_{ij}, SS_{ij} \times BV_{ij}, and\ SEL_I_{ij} \times BV_{ij}$ for school *j;*

22) u_{8j} is a cluster of the random effects for the Student_Demographics$_{ij}$ slopes for school j.

When the four sets of the seven models were examined, the proportions of change of variance were first examined to gauge the relative contributions of the predictors and moderation terms to the variances of school engagement at both the student and school levels. This was done following the approach suggested by Woltman, Feldstain, MacKay, and Rocchi (2012). Coefficient estimates, significance levels, and effect sizes of predictors and moderators also were calculated and compared to further quantify the magnitude and practical importance of the main and

moderation effects (Lee, Loeb, & Lubeck, 1998). The magnitude of effect sizes was generally determined using the criteria suggested by Rosenthal and Rosnow (1984). As such, effects of .50 standard deviation or more in magnitude are viewed as large, .30 to .50 as moderate, .10 to .30 as small, and below .10 as trivial. However, researchers have argued that the statistical power to detect significant multilevel moderation effects, particularly the cross-level moderation effects, could be impacted by various factors. Those factors include the magnitude of the cross-level interaction, the standard deviation of lower level slopes, the lower and upper level sample sizes, true distributions of slopes, and standardization and centering techniques (Mathieu, Aguinis, Culpepper, & Chen, 2012). Thus, the interpretation of the magnitude of the multilevel moderation effects, particularly the cross-level moderation effects, should not be solely based on a fixed criterion for effect size or significance level. Researchers are strongly encouraged to leverage prior work in their substantive areas and/or conduct a pilot study to choose reasonable values for interpreting the magnitude of the effects (Mathieu et al., 2012).

Chapter 3

RESULTS

In the following sections, results of Model 1 are first presented while discussing the intraclass correlation coefficient (ICC) and its implications. Then results of Models 2 are presented to answer the first research question regarding the main effects of student- and school-level demographic factors on school engagement. Next, results of four sets of Models 3-5 are presented to answer the second research question regarding the multilevel main effects of bullying victimization (i.e., overall bullying victimization [OBV], physical bullying victimization [PBV], verbal bullying victimization [VBV], and relational bullying victimization [RBV]), teacher-student relationships (TS), student-student relationships (SS), and teachers' use of SEL instructional techniques (SEL_I) on school engagement. Results of the four sets of Models 6-7 are presented to answer the third main research question about the multilevel moderation effects of TS, SS, and SEL_I in the association between bullying victimization and school engagement. For the second and third main research questions, results of the first set of models, with OBV as the predictor, are first presented. Results of all four sets of models are next summarized to examine if the main effects and moderation effects vary depending on the types of bullying victimization scores used. In addition, visual presentations are utilized to illustrate the main effects and moderation effects in the multilevel context.

Descriptive Analyses

Table 3 presents the means (*M*s) and standard deviations (*SD*s) of scores measured at the student level for each of the continuous independent variables (i.e., $OBV_{student\ level}$, $PBV_{student\ level}$, $VBV_{student\ level,}$ and $RBV_{student\ level}$), independent and moderating variables (i.e., $TS_{student\ level}$, $SS_{student\ level,}$ and $SEL_I_{student\ level}$), and the dependent variable (i.e., school engagement). Table 4 presents the means and standard deviations of scores aggregated at the school level for the continuous independent variables (i.e., $OBV_{school\ level}$, $PBV_{school\ level}$, $VBV_{school\ level}$, $RBV_{school\ level}$, school size, percentage of students receiving free or reduced-price lunch [FRL], racial/ethnic diversity index, and the continuous independent and moderating variables [$TS_{school\ level}$, $SS_{school\ level}$, and $SEL_I_{school\ level}$].

In Table 3, scores for OBV, PBV, VBV and RBV represent average item scores, calculated by dividing the sum score of items on the given scale or subscale by the total number of items on the respective scale or subscale. As shown in Table 3, all four bullying victimization scores at the student level (i.e., $OBV_{student\ level}$, $PBV_{student\ level}$, $VBV_{student\ level,}$ and $RBV_{student\ level)}$ correlated weakly with school engagement (*r*s = -.18 to -.16). These results provide preliminary estimates of the predictive effects of bullying victimization scores on school engagement at the student level, as examined in the HLM analyses that followed. It should be noted that the correlations between scores for bullying victimization and school engagement might be attenuated due to the multi-model distribution of bullying victimization scores. The weak correlations between bullying victimization and school engagement scores might be attributed to a floor effect resulting from the majority of students not being victims of frequent bullying. Due to the floor effect, students' bullying victimization scores amass at the

very low end of the scale, and thus bullying victimization's relationship with school engagement might be hidden for those students who experience significant bullying.

Tables 3 and 4 also present the correlations among the continuous variables at the student and school levels, respectively. As shown in those tables, strong and positive correlations were found among the four bullying victimization scores at both the student level (*r*s = .77 to .94) and school level (*r*s = .92 to .98). The high correlations indicate that to a large extent the 12-item Bullying Victimization Scale and its three 4-item subscales assess a continuous body of characteristics of bullying victimization. This finding was further confirmed by comparing the results of hierarchical linear regression models across the four different bullying victimization scores, as presented in the later sections of this chapter.

The correlations among the predictors included in the hierarchical linear regression models were examined to identify if multicollinearity existed among the predictors. Multicollinearity is detected when two or more predictor variables in a multiple regression model are highly correlated (Raudenbush & Byrk, 2002). As shown in Tables 3 and 4, most of the correlation coefficients between bullying victimization (i.e., OBV, PBV, VBV, and RBV) and the other three factors representing the SEL approach (i.e., TS, SS, and SEL_I) were within the weak range at both the student level (*r*s = -.28 to -.12) and school level (*r*s = -.09 to -.05). Exceptions were that the four bullying victimization scores (i.e., $OBV_{\text{student level}}$, $PBV_{\text{student level}}$, $VBV_{\text{student level,}}$ and $RBV_{\text{student level}}$) correlated moderately with $SS_{\text{student level}}$ (*r*s = -.55 to .53), and the correlations among TS, SS, and SEL_I were moderate at the student level (*r*s = .52 to .63) and high at the school level (*r*s = .76 to .98). Thus, in the hierarchical linear regression models there was no evidence of multicollinearity

Table 3 Descriptive Statistics of the Continuous Variables at the Student Level

Variables	*M*	*SD*	*Correlational Relationships*							
			1	2	3	4	5	6	7	8
1. Overall Bullying Victimization	1.60	0.94	1							
2. Physical Bullying Victimization	1.47	0.88	.90*	1						
3. Verbal Bullying Victimization	1.81	1.18	.94*	.77*	1					
4. Relational Bullying Victimization	1.54	1.02	.94*	.78*	.82*	1				
5. School Engagement	3.11	0.56	-.18*	-.16*	-.17*	-.16*	1			
6. Teacher-Student Relationships	3.12	0.65	-.15*	-.15*	-.12*	-.14*	.62*	1		
7. Student-Student Relationships	2.64	0.66	-.27*	-.22*	-.28*	-.25*	.51*	.53*	1	
8. SEL Instructional Techniques	2.89	0.63	-.13*	-.12*	-.12*	-.12*	.55*	.63*	.52*	1

Note. *M* = Mean, *SD* = standard deviation.
Student-level sample sizes ranged from 24,055 to 25,518
* $p < .001$.

Table 4 Descriptive Statistics of the Continuous Variables at the School Level

Variables	*M*	*SD*	Correlational Relationships									
			1	2	3	4	5	6	7	8	9	10
School Level												
1. Overall BV	1.63	0.22	1									
2. Physical BV	1.50	0.21	.97***	1								
3. Verbal BV	1.85	0.26	.97***	.92***	1							
4. Relational BV	1.57	0.21	.98***	.94***	.93***	1						
5. TS	3.26	0.32	- .09	- .09	- .09	- .09	1					
6. SS	2.71	0.28	- .55*	- .53*	- .54*	- .53*	.79*	1				
7. SEL_I	3.03	0.30	- .05	-.05	- .05	- .05	.98*	.76*	1			
8. School Size	676.00	290.00	- .23*	- .23*	- .24*	- .20*	- .60***	- .27***	- .61*	1		
9. FRL	58.06	21.20	.41***	.46***	.36***	.42***	.01	- .32**	.05	- .32**	1	
10. Student Racial Diversity Index	0.57	0.12	-.35***	- .37***	- .33***	- .36***	-.05	.08	-.05	.18	.02	1

Note. *M* = Mean; *SD* = Standard Deviation; BV = Bullying Victimization; TS = Teacher-Student Relationships; SS = Student-Student Relationships; SEL_I = SEL Instructional Techniques; FRL = Percentage of Students Receiving Free or Reduced-Price Lunch.
School sample size *N* = 114.
***$p < .001$; ** $p < .01$; *$p < .05$

among the predictors, with the exception of the high correlation between $TS_{school\ level}$ and $SEL_I_{school\ level}$. As was discussed in Chapter 2, group-mean-centering and grand-mean-centering approaches have been applied to minimize the threat of multicollinearity in the models. Nevertheless, despite the adjustment for multicollinearity, the predictive effects of the $TS_{school\ level}$ and $SEL_I_{school\ level}$ on school engagement should be interpreted with caution.

Hierarchical Linear Modeling

Following the analytic procedure described at the beginning of this chapter, Model 1 was first specified in a hierarchical fashion to calculate the ICC and to determine if it is appropriate to conduct multilevel analyses to answer the three main research questions. Model 1 is an unconditional model with no predictors and with school engagement as the outcome. This model explains the amount of variance in school engagement accounted for by student and school factors, respectively. The ICC value of 19.25% revealed that 19.25% of the variance in students' school engagement could be explained by school factors, leaving 80.75% unaccounted for at the student level. The results of Model 1 also indicate that there was significant variance in school engagement explained by school groupings [χ^2 (113) = 5323.35, $p < 0.001$], which provided evidence to support the use of multilevel analyses (Lee et al., 1998). Thus, the results of Model 1 suggested that the factors reported at both the student and school level made reasonable contributions to the variance of school engagement; therefore, it was necessary to conduct multilevel analyses.

Research Question One

The first research question was: What are the effects of student-level and school-level demographic factors on students' school engagement? To answer this question, hierarchical linear regression analyses were conducted in Models 2. Models 2 are conditional models with student-level demographic factors (i.e., gender and race-ethnicity) added as student-level predictors and school-level demographic factors (i.e., grade level, school size, percentage of students receiving FRL, and racial/ethnic diversity index) added as school-level predictors. Because the questions addressed by Models 2 were not related to the specific types of bullying victimization, Models 2 were identical across the four sets of models. Thus, only the results of one Model 2 are presented in Table 5. The significant effects of gender, race-ethnicity, and grade level on school engagement are also illustrated in Figure 2.

Effects of Student-Level Demographics

As shown in Table 5, female students had higher school engagement than male students ($b = 0.05$, $p < .001$, $ES = 0.10$). African American students had lower school engagement than Hispanic/Latino students ($b = 0.07$, $p < .001$, $ES = 0.14$), Caucasian students ($b = 0.06$, $p < .001$, $ES = 0.12$), and Asian students ($b = 0.17$, $p < .001$, $ES = 0.34$). However, African American students had higher school engagement than students who identified themselves as "Other race/ethnicity including multi-race/ethnicity" ($b = - 0.05$, $p < .001$, $ES = 0.10$). Among all racial/ethnic groups, Asian students had the highest school engagement, and students identified as "Other race/ethnicity including multi-race/ethnicity" had the lowest.

When the gender differences for school engagement were further examined at each grade level, results showed that in elementary school female students reported

Table 5 Multilevel Main Effects of Student-Level and School-Level Demographic Factors on School Engagement in Model 2

	Coefficient	*SE*	*P* Value	*ES*[a]
Intercept of School Engagement	3.22	0.02	< .001	-
Student-Level Main Effects				
Gender[b]				
Male vs. Female Student	0.05	0.01	< .001	**0.10**
Race[b]				
Hispanic vs. African-American	0.07	0.01	< .001	**0.14**
Caucasian vs. African-American	0.06	0.01	< .001	**0.12**
Asian vs. African-American	0.17	0.02	< .001	**0.34**
Other Race/Ethnicity vs. African-American	- 0.05	0.01	< .001	**- 0.10**
School-Level Main Effects				
Grade Level[b]				
Elementary vs. Middle Schools	0.35	0.02	< .001	**1.40**
High vs. Middle Schools	0.18	0.03	< .001	**- 0.70**
School Size	0.00	0.00	.992	0.00
Percentage of Students Receiving Free or Reduced-Price Lunch	- 0.02	0.00	.002	**- 0.06**
Student Racial Diversity Index	0.08	0.09	.377	0.32

Note. SE = standard error; *ES* = effect size.

[a]At the student level, the effect size of the main effect was calculated by dividing the main effect coefficient by 0.51, which was the student-level standard deviation of the random effect estimate in the unconditional model (Model 1). At the school level, the effect size of the main effect was calculated by dividing the coefficient by 0.25, which was the school-level standard deviation of the random effect estimate in the unconditional model (Model 1).

[b] The main effects of the gender, race, and grade levels refer to the differences between the two compared groups. The comparison reference group for gender effect was male students; the comparison reference group for race/ethnicity effect was African-American student; and the comparison reference group for grade level effect was middle school students.

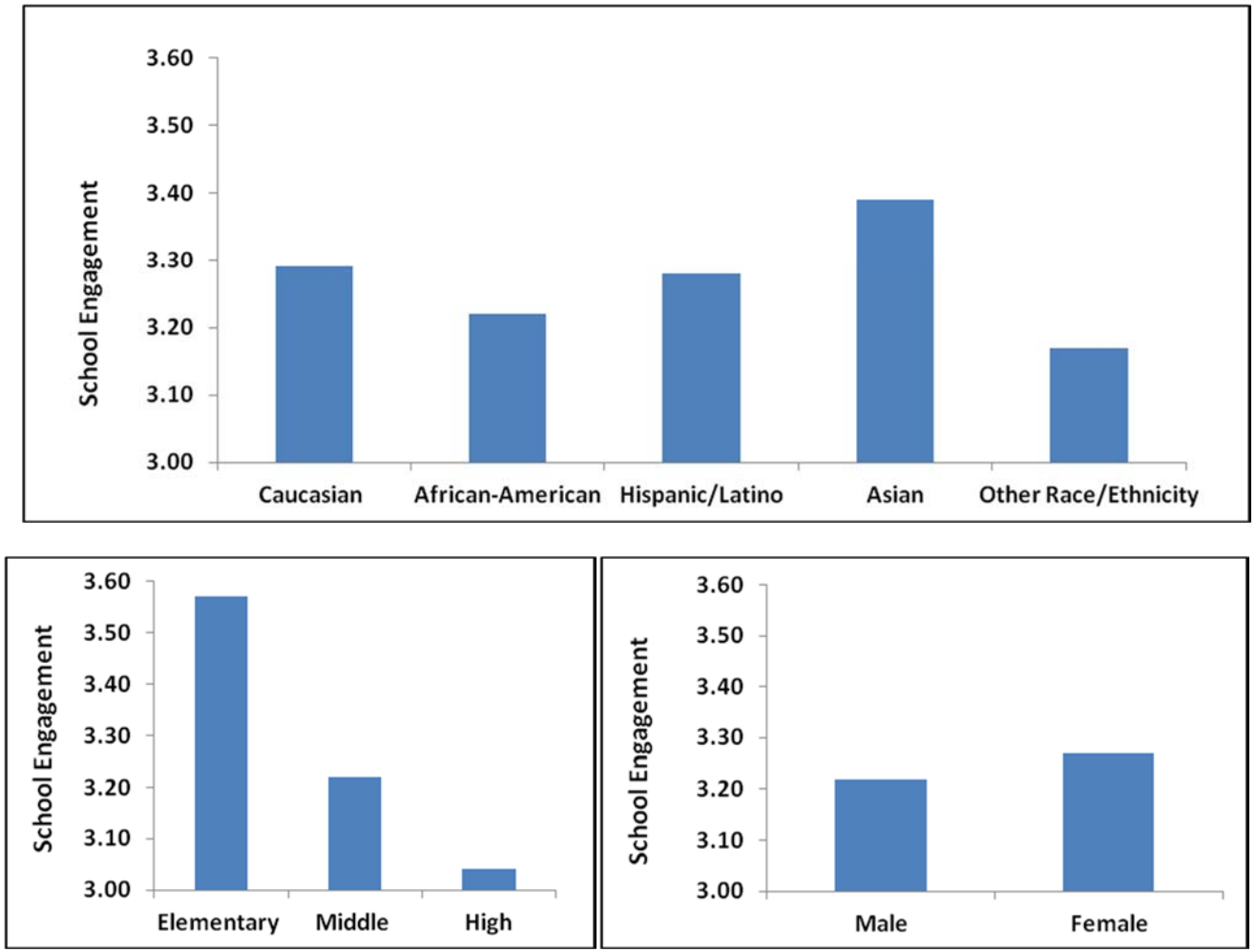

Figure 2 Main Effects of Gender, Race/Ethnicity, and Grade Level on School Engagement

significantly higher school engagement than male students, t (9,399) = - 10.00, p < .001; Cohen's d = 0.20. In middle school female students reported significantly higher school engagement than male students, t (9,399) = - 10.00, p < .001; Cohen's d = 0.02. In high school there was no significant difference in school engagement, t (6528) = .49, p = .802; Cohen's d = 0.02. Although the gender difference in middle schools was statistically significant, the trivial effect size (d = 0.02) indicated that the magnitude of the gender difference among middle school students was negligible and not meaningful in practice. Thus, a meaningful and significant gender difference in school engagement was found only in elementary school.

Effects of School-Level Demographics

Results of Model 2, as shown in Table 5, suggest that elementary school students reported higher school engagement than middle school students (b = 0.35, p < .001, ES = 1.40), and high school students reported less school engagement than middle school students (b = - 0.18, p < .001, ES = - 0.70). Results of Model 2 also showed that a school's percentage of students receiving FRL was statistically related to school engagement, with a trivial effect size (b = - 0.02, p = < .001, ES = - 0.06), and that school size was not statistically related to school engagement, with a trivial effect size (b = 0.00, p = .992, ES = 0.00). Although a school's racial/ethnic diversity index was not statistically related to school engagement (b = 0.08, p = .376), the effect size was within the moderate range (ES = 0.32). The moderate effect size suggests that the predictive effect of a school's racial/ethnic diversity index on school engagement may be meaningful in practice. The nonsignificant p value of the predictive effect of a school's racial/ethnic diversity index on school engagement might be due to the lack of statistical power, which could be attributed to the much smaller sample size at the

school level than at the student level.

Among the school-level demographic factors added in Model 2, the coefficient estimate measuring the difference in school engagement between elementary and middle schools was higher than the one measuring the difference in school engagement between middle and high schools. They also were higher than the coefficient estimates measuring the effect of other continuous school-level demographic predictors (i.e., school size, percentage of students receiving FRL, school's racial/ethnic diversity index). Thus, the grade level differences, particularly the grade level differences between elementary and middle schools, demonstrated the strongest effects on school engagement among the school-level demographic factors examined in the study.

When the significant coefficient estimates of the student-level and school-level demographic factors were compared, the absolute values of coefficient estimates of the significant predictor at the school level (i.e., grade level) were generally larger than the coefficient estimates of the significant predictors at the student level (i.e., gender and race). These results are consistent with the results on the proportions of the change in variance explained at the student and school levels in Model 2. They also indicate the importance of contextual effects on school engagement. As shown in Table 6, the addition of student- and school-level demographics as predictors in Model 2 explained 1.73% of additional variance in school engagement at the student level and 84.86% of additional variance in school engagement at the school-level. The small proportion of additional variance (1.73%) explained by the added student-level demographics suggests that in addition to gender and race, there are other potential student-level predictors that could make significant contributions to the variance in

school engagement.

In summary, when the effects of student-level and school-level demographic factors on school engagement were examined in Model 2, results showed that school engagement was not only significantly related to a student's gender and racial/ethnic background but also significantly related to the school's grade level and percentage of students receiving FRL. School engagement was not significantly related to school size. Although the association between school engagement and a school's racial/ethnic diversity index was not statistically significant, the moderate effect size suggests that the relationship may be practically meaningful.

After examining the ICCs and the main effects of demographic factors on school engagement, four sets of five hierarchical linear regression models (i.e., Models 3-7) were examined to investigate research questions one and two, with each set of models addressing each type of bullying victimization (i.e., OBV, PBV, VBV, and RBV).

Research Question Two

The second question was: Do bullying victimization, TS, SS, and SEL_I have significant effects on school engagement at the student and school levels when individual-level and school-level demographic factors are statistically controlled? To answer this question, four sets of Models 3-5 were specified in a hierarchical fashion, based on results of Model 2, to examine the main effects of bullying victimization, TS, SS, and SEL_I on student engagement at both the student and school levels. In each set of Models 3-5, only one of the four different bullying victimization scores (i.e., OBV, PBV, VBV, and RBV) was included to represent the variable of bullying victimization. The four sets of models were:

Table 6 Proportion of Variance Explained at the Student and School Levels for Models 2-7 with Four Types of Bullying Victimization as Predictors

	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Models with Overall Bullying Victimization as Predictor						
Student-level Variance Component Estimate (σ2)	0.25	0.24	0.16	0.16	0.16	0.16
School-level Variance Components Estimate (τ00)	0.01	0.01	0.01	0.00	0.00	0.00
Proportion of Variance Explained at Student Level by the Addition of Predictor(s)[a]	1.73%	4.57%	32.49%	-	1.10%	-
Proportion of Variance Explained at School Level by the Addition of Predictor(s)[b]	84.86%	17.43%	-[c]	81.48%	-	1.12%
Models with Physical Bullying Victimization as Predictor						
Student-level Variance Component Estimate (σ2)	0.25	0.25	0.16	0.16	0.16	0.16
School-level Variance Components Estimate (τ00)	0.01	0.01	0.01	0.00	0.00	0.00
Proportion of Variance Explained at Student Level by the Addition of Predictor(s)[a]	1.73%	3.67%	33.03%	-	1.14%	-
Proportion of Variance Explained at School Level by the Addition of Predictor(s)[b]	84.86%	22.67%	-	80.19%	-	0.00%
Models with Verbal Bullying Victimization as Predictor						
Student-level Variance Component Estimate (σ2)	0.25	0.24	0.16	0.16	0.16	0.16
School-level Variance Components Estimate (τ00)	0.01	0.01	0.01	0.00	0.00	0.00
Proportion of Variance Explained at Student Level by the Addition of Predictor(s)[a]	1.73%	4.14%	32.72%	-	0.90%	-
Proportion of Variance Explained at School Level by the Addition of Predictor(s)[b]	84.86%	17.11%	-	81.57%	-	2.25%
Models with Relational Bullying Victimization as Predictor						
Student-level Variance Component Estimate (σ2)	0.25	0.24	0.16	0.16	0.16	0.16
School-level Variance Components Estimate (τ00)	0.01	0.01	0.01	0.00	0.00	0.00

Table 6 Continued.

Proportion of Variance Explained at Student Level by the Addition of Predictor(s)[a]	1.73%	3.93%	32.88%	-	1.04%	-
Proportion of Variance Explained at School Level by the Addition of Predictor(s)[b]	84.86%	14.12%	-	82.35%	-	0.59%

Note. When the proportion of variance explained was calculated, the previous model (i.e., the model specified in the previous hierarchical step before the new predictors were added), not the null model, was chosen as the comparison model.

[a]Proportion of Variance Explained at Student Level by the Addition of Predictor(s) = $(\sigma^2_{\text{previous model}} - \sigma^2_{\text{current model}})/ \sigma^2_{\text{previous model}}$.

[b]Proportion of Variance Explained at School Level by the Addition of Predictor(s) = $(\tau^{00}_{\text{previous model}} - \tau^{00}_{\text{current model}})/ \tau^{00}_{\text{previous model}}$.

[c]Proportion of Variance Explained is included only for levels in which the model was modified from the previous model.

1. Models 3: Conditional model with school engagement as outcome, demographic factors as both student and school-level covariates, and with $BV_{student\ level}$ added as student-level predictor, and $BV_{school\ level}$ added as school-level predictors;
2. Models 4: Conditional model with all predictors and outcome in Model 3, and with $TS_{student\ level}$, $SS_{student\ level}$, and $SEL_I_{studentlevel}$ added as student-level predictors;
3. Models 5: Conditional model with all predictors and outcome in Model 4, and with $TS_{school\ level}$, $SS_{school\ level}$, and $SEL_I_{school\ level}$ added as school-level predictors.

After the four sets of Models 3-5 were specified, they were tested using HLM. The proportions of change in variance in school engagement, as explained by the predictors hierarchically added in Models 3-5, are presented in Table 6. The statistical results of the multilevel main effects of bullying victimization (i.e., OBV, PBV, VBV, and RBV) on school engagement, including coefficient estimates, standard errors, significance levels, and effect sizes are presented in Table 7. The statistical results of the multilevel main effects of TS, SS, and SEL_I on school engagement are presented in Table 8.

In the following sections the proportions of change in variances in school engagement explained by the added predictors across the four sets of models are first discussed, with the purpose of exploring any multilevel main effects that should be accounted for in subsequent analyses. Next, the results of the first set of Models 3-5 are discussed, with a focus on the main effects of OBV, TS, SS, and SEL_I on school engagement. Results of the four sets of models are then compared to examine if the main effects of bullying victimization, TS, SS, and SEL_I on school engagement Varied depending on the type of bullying victimization score used.

Proportions of Change in Variance in School Engagement Explained by the Addition of Student-Level and School-Level Predictors

Overall, as shown in Table 6, across the four sets of Models 3-5, when bullying victimization, TS, SS, and SEL_I were added as predictors at both the student and school levels, the overall proportion of change in variance in school engagement explained by the school-level predictors was larger than the overall proportion of change in variance in school engagement explained by the student-level predictors. For example, when overall bullying victimization was added as a predictor at both the student and school levels in Model 3, the proportion of variance explained in school engagement increased by 4.57% at the student level and by 17.43% at the school level. When TS, SS, and SEL_I were added as student-level predictors in Model 4, the proportion of variance explained in school engagement increased by 32.49% at the student level. When TS, SS, and SEL_I were added as school-level predictors in Model 5, the proportion of variance explained in school engagement increased by 81.48% at the school level. This pattern of change in variance indicates that the school-level factors had a greater contribution to the proportion of change in variance explained in school engagement in comparison to their corresponding student-level predictors. In order to further examine this pattern, the magnitude and statistical significance of the main effects of these predictors were examined. Results are presented in the following two sections.

Multilevel Main Effects of Bullying Victimization

As shown in the left column titled "Overall Bullying Victimization" in Table 7, overall bullying victimization had a negative and statistically significant relationship on school engagement at both the student level (b = - 0.12, p < 0.001, ES = - 0.23) and school level (b = - 0.26, p < 0.001, ES = -1.03). The greater effect size at the school

level indicates that the variance in overall bullying victimization between schools had a more substantial effect on school engagement than the variance in overall bullying victimization between students. The student-level main effects can be interpreted as indicating that a one-unit increase in the student-average score for overall bullying victimization was associated with a decrease of 0.12 unit of the school engagement score reported by students, and this occurred after (a) students' and schools' scores on demographic factors were adjusted to the average scores of the student and school samples; and (b) the school-level score for overall bullying victimization was adjusted to its average score. Likewise, the school-level main effects can be interpreted as indicating that with a one-unit increase in the school-average score for overall bullying victimization was associated with a decrease of 0.26 unit of the school engagement score reported by students, and this occurred after (a) students' and schools' scores on demographic factors were adjusted to the average score of the student and school samples; and (b) the student-level score for overall bullying victimization was adjusted to its average score. The average level of the student demographic factors refers to the average proportion of the gender and racial/ethnic composition among all students included in the study. The average level of the school demographic factors refers to the average proportion of the grade level composition and the average values of school size, percentage of students receiving FRL, and racial/ethnic diversity index scores. The intercept value of 3.22 represents the student mean score for school engagement when the above student-level and school-level demographics were adjusted to the average level across student and school populations. The multilevel main effects of overall bullying victimization on school engagement are also illustrated in Figure 3.

As shown in Table 7, irrespective which of the four bullying victimization scores was used, bullying victimization was significantly related to school engagement (all *p*s values below .001), with differences of coefficient estimates ranging from 0.00 to 0.03 at the student level and from 0.02 to 0.09 at the school level. The effect sizes of the main effects of the four types of bullying victimization were moderate in magnitude at the student level and high at the school level. Consistent with the statistical findings on Models 3, the proportion of change in variance in school engagement as explained by the added predictor (bullying victimization) in Models 3, as shown in Table 6, was similar across the four bullying victimization scores.

Multilevel Main Effects of Social-Emotional Learning Approach

To examine the multilevel main effects of the social-emotional learning (SEL) approach with student-level and school-level demographic factors and bullying victimization statistically controlled, the student-level main effects of SS, TS, and SEL on school engagement were tested in Models 4 and the school-level main effects of SS, TS, and SEL_I were tested in Models 5. When the results of Models 4 and Models 5 were compared, results showed that the common variables included in both Model 4 and Model 5 generated mostly identical statistical results. Thus, the results of Models 4 are not presented to avoid redundancy and results of Models 5 are presented in Table 8 and summarized below.

As shown in Table 8, at the student level, $SS_{\text{student level}}$, $TS_{\text{student level}}$, and $SEL_I_{\text{student level}}$ were significantly related to school engagement, with effect sizes ranging from small to large (.29 to .59, all *p*s < .001). Likewise, at the school level $SS_{\text{school level}}$, $TS_{\text{school level}}$, and $SEL_I_{\text{school level}}$ were significantly related to school engagement, with effect sizes being large (.70 to 1.66, all *p*s < .001). Results in Table

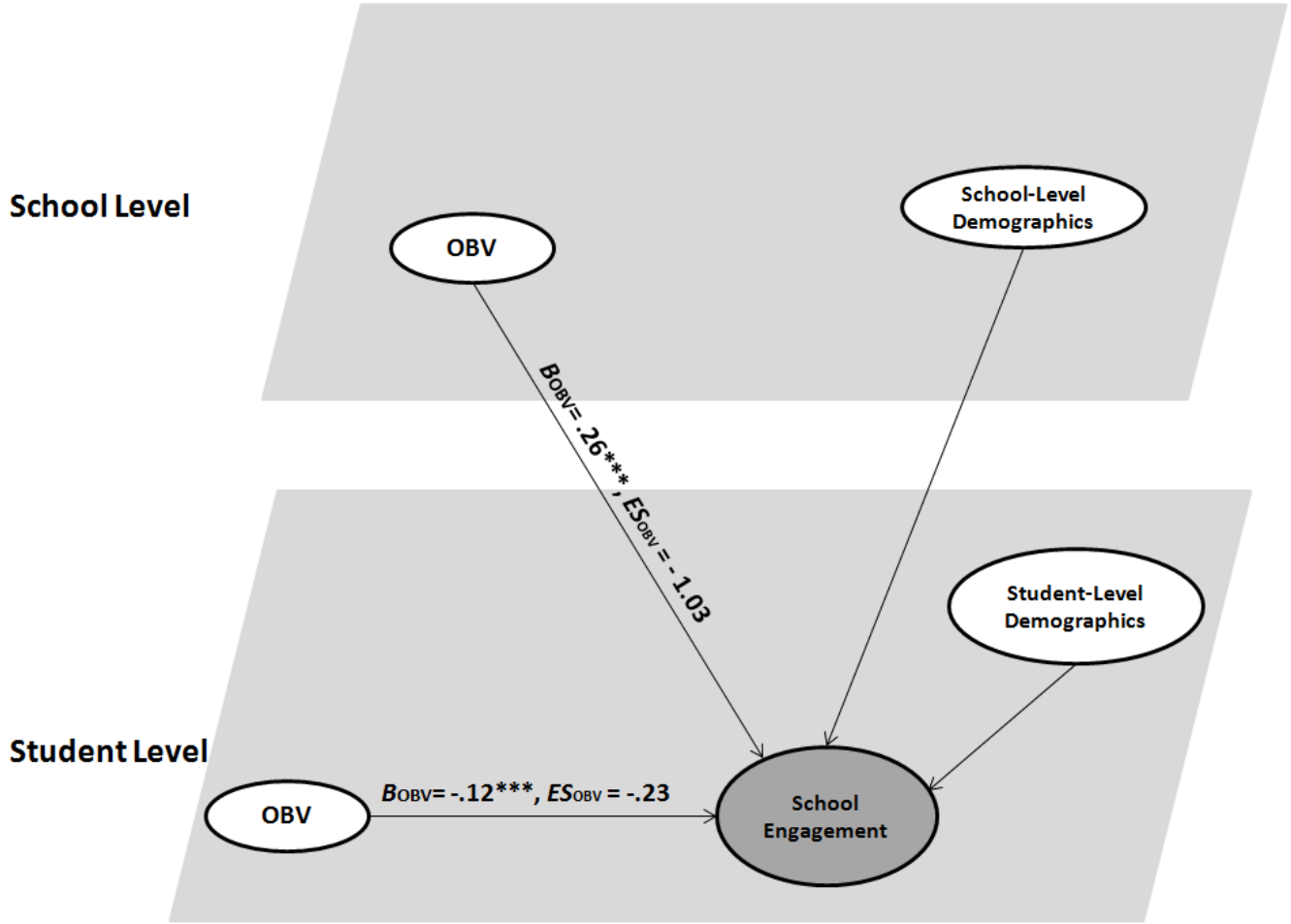

Figure 3 Multilevel Main Effects of Overall Bullying Victimization on School Engagement

Table 7 Statistical Estimates of Main Effects of Student-Level Demographic Factors, School-Level Demographic Factors, and Bullying Victimization on School Engagement in Models 3

	Overall BV[a]				Physical BV[a]				Verbal BV[a]				Relational BV[a]			
	Co.	*SE*	*p* value	*ES*[b]	Co.	*SE*	*p* value	*ES*[b]	Co.	*SE*	*p* value	*ES*[b]	Co.	*SE*	*p* value	*ES*[b]
Intercept of School Engagement	3.22	0.01	<.001	-	3.22	0.01	<.001	-	3.22	0.01	<.001	-	3.22	0.01	<.001	-
Student-Level Main Effects																
Gender[c]																
Male vs. Female	0.05	0.01	<.001	**0.10**	0.04	0.01	<.001	**0.07**	0.05	0.01	<.001	**0.10**	0.06	0.01	<.001	**0.11**
Race[c]																
Hispanic vs. AA	0.06	0.01	<.001	**0.11**	0.06	0.01	<.001	**0.12**	0.06	0.01	<.001	**0.11**	0.06	0.01	<.001	**0.11**
Caucasian vs. AA	0.06	0.01	<.001	**0.13**	0.06	0.01	<.001	**0.12**	0.07	0.01	<.001	**0.13**	0.06	0.01	<.001	**0.12**
Asian vs. AA	0.17	0.02	<.001	**0.34**	0.17	0.02	<.001	**0.34**	0.17	0.02	<.001	**0.34**	0.17	0.02	<.001	**0.33**
Others vs. AA	- 0.04	0.01	.003	**- 0.08**	- 0.04	0.01	.001	**- 0.09**	- 0.04	0.01	.004	**- 0.08**	- 0.04	0.01	.001	**- 0.08**
BV	- 0.12	0.01	<.001	**- 0.23**	- 0.12	0.01	<.001	**- 0.23**	- 0.09	0.00	<.001	0.18	- 0.10	0.01	<.001	**- 0.20**
School-Level Main Effects																
Grade Level[c]																
Elementary vs. Middle	0.36	0.02	<.001	**1.45**	0.37	0.02	<.001	**1.47**	0.36	0.02	<.001	**1.43**	0.37	0.02	<.001	**1.47**
High vs. Middle	- 0.19	0.03	<.001	**- 0.74**	- 0.19	0.03	<.001	**- 0.77**	- 0.20	0.03	<.001	**- 0.79**	- 0.17	0.03	<.001	**- 0.69**
School Size	0.00	0.00	.840	0.00	0.00	0.00	.684	0.00	0.00	0.00	.963	0.00	0.00	0.00	.803	0.00

Table 7 Continued.

FRL	- 0.01	0.00	.307	0.00	0.00	0.00	.664	0.00	0.00	0.00	.159	0.00	0.00	0.00	.257	0.00
DI	- 0.07	0.09	.461	- 0.26	- 0.10	0.09	.251	- 0.41	- 0.05	0.09	.542	- 0.21	- 0.05	0.09	.576	- 0.20
BV	- 0.26	0.05	<.001	**-1.03**	- 0.30	0.06	<.001	**-1.20**	- 0.21	0.04	<.001	**- 0.86**	- 0.24	0.06	<.001	**- 0.97**

Note. Co = Coefficient; SE = standard error; ES = effect size; AA = African-American Students; FRL = Percentage of Students Receiving Free or Reduced-Price Lunch; DI = Racial/Ethnic Diversity Index; BV = Bullying Victimization.

[a]Statistical Estimates of Model 3 with Overall Bullying Victimization, or Physical Bullying Victimization, or Verbal Bullying Victimization, or Relational Bullying Victimization as the Predictor Representing Bullying Victimization, respectively.

[b]At the student level, the effect size of the main effect was calculated by dividing the main effect coefficient by 0.51, which was the student-level standard deviation of the random effect estimate in the unconditional model (Model 1). At the school level, the effect size of the main effect was calculated by dividing the coefficient by 0.25, which was the school-level standard deviation of the random effect estimate in the unconditional model (Model 1). At both levels, effect size of moderation effect is calculated by dividing the moderation effect coefficient by the standard deviation of the slope, which is calculated by multiplying the standard error of the corresponding moderator's main effect by the square root of the sample size (Lee, 1998).

[c] The main effects of the gender, race, and grade levels refer to the differences between the two compared groups. The comparison reference group for gender effect was male students; the comparison reference group for race/ethnicity effect was African-American student; and the comparison reference group for grade level effect was middle school students.

Table 8 **Statistical Estimates of Main Effects of Student-Level Demographic Factors, School-Level Demographic Factors, Bullying Victimization, and the SEL Approach on School Engagement in Models 5**

	Overall BV[a]				Physical BV[a]				Verbal BV[a]				Relational BV[a]			
	Co.	*SE*	*p* value	*ES*[b]	Co.	*SE*	*p* value	*ES*[b]	Co.	*SE*	*p* value	*ES*[b]	Co.	*SE*	*p* value	*ES*[b]
Intercept of School Engagement	3.22	0.01	<.001	-	3.22	0.01	<.001	-	3.22	0.01	<.001	-	3.22	0.01	<.001	-
Student-Level Main Effects																
Gender[c]																
Male vs. Female	0.06	0.01	< .001	**0.13**	0.06	0.01	< .001	**0.12**	0.07	0.01	< .001	**0.13**	0.07	0.01	< .001	**0.13**
Race[c]																
Hispanic vs. AA	0.00	0.01	.736	0.01	0.00	0.01	.713	0.01	0.00	0.01	.765	0.01	0.00	0.01	.747	0.01
Caucasian vs. AA	0.01	0.01	.173	0.02	0.01	0.01	.279	0.02	0.01	0.01	.160	0.03	0.01	0.01	.223	0.02
Asian vs. AA	0.09	0.02	< .001	**0.19**	0.09	0.02	< .001	**0.18**	0.09	0.02	< .001	**0.19**	0.09	0.02	< .001	**0.18**
Others vs. AA	- 0.02	0.01	.064	- 0.03	- 0.02	0.01	.099	- 0.03	- 0.02	0.01	.144	- 0.03	- 0.02	0.01	.098	- 0.03
BV	- 0.04	0.00	< .001	**- 0.07**	- 0.03	0.01	< .001	**- 0.06**	- 0.03	0.00	< .001	**- 0.06**	- 0.03	0.00	< .001	**- 0.06**
TS	0.30	0.01	< .001	**0.59**	0.30	0.01	< .001	**0.59**	0.30	0.01	< .001	**0.60**	0.30	0.01	< .001	**0.59**
SS	0.17	0.01	< .001	**0.33**	0.18	0.01	< .001	**0.35**	0.17	0.01	< .001	**0.33**	0.17	0.01	< .001	**0.34**
SEL	0.15	0.01	< .001	**0.29**	0.15	0.01	< .001	**0.29**	0.15	0.01	< .001	**0.29**	0.15	0.01	< .001	**0.29**

Table 8 Continued.

School-Level Main Effects																
Grade Level[c]																
Elementary vs. Middle	0.03	0.02	.273	**0.11**	0.03	0.02	.207	**0.12**	0.03	0.02	.295	**0.10**	0.02	0.02	.286	**0.09**
High vs. Middle	- 0.05	0.02	.006	**- 0.21**	- 0.05	0.02	.007	**- 0.21**	- 0.05	0.02	.012	**- 0.20**	- 0.05	0.02	.002	**- 0.22**
School Size	0.00	0.00	.305	0.00	0.00	0.00	.218	0.00	0.00	0.00	.385	0.00	0.00	0.00	.190	0.00
RFL	0.00	0.00	.639	0.00	0.00	0.00	.599	0.00	0.00	0.00	.738	0.00	0.00	0.00	.558	0.00
DI	- 0.05	0.05	.287	- 0.20	- 0.05	0.05	.264	- 0.22	- 0.05	0.05	.264	- 0.21	- 0.05	0.04	.227	- 0.19
BV	0.04	0.04	.369	0.14	0.01	0.04	.758	0.05	0.03	0.03	.319	0.13	0.05	0.03	.130	0.20
TS	0.42	0.08	< .001	**1.66**	0.42	0.08	< .001	**1.69**	0.41	0.08	< .001	**1.66**	0.41	0.07	< .001	**1.64**
SS	0.18	0.05	.002	**0.70**	0.16	0.05	.003	**0.63**	0.18	0.05	.001	**0.72**	0.18	0.05	< .001	**0.73**
SEL	0.20	0.08	.018	**0.78**	0.19	0.08	.019	**0.77**	0.20	0.08	.017	**0.79**	0.20	0.07	.008	**0.79**

Note. Co = Coefficient; SE = standard error; ES = effect size; AA = African-American; FRL = Percentage of Students Receiving Free or Reduced-Price Lunch; DI = Racial/Ethnic Diversity Index; BV = Bullying Victimization.

[a]Statistical Estimates of Model 3 with Overall Bullying Victimization, or Physical Bullying Victimization, or Verbal Bullying Victimization, or Relational Bullying Victimization as the Predictor Representing Bullying Victimization.

[b]At the student level, the effect size of the main effect was calculated by dividing the main effect coefficient by 0.51, which was the student-level standard deviation of the random effect estimate in the unconditional model (Model 1). At the school level, the effect size of the main effect was calculated by dividing the coefficient by 0.25, which was the school-level standard deviation of the random effect estimate in the unconditional model (Model 1).

[c] The main effects of the gender, race, and grade levels refer to the differences between the two compared groups. The comparison reference group for gender effect was male students; the comparison reference group for race/ethnicity effect was African-American student; and the comparison reference group for grade level effect was middle school students.

8 also show that TS, SS, and SEL_I were significantly associated with school engagement at both the student and school levels. The associations were greater at the school level than the student level. Moreover, the main effects of overall bullying victimization on school engagement were relatively weaker than the main effects of TS, SS, and SEL_I on school engagement at both the student level and the school level. In Model 5, overall bullying victimization was significantly associated with school engagement, with a trivial effect size at the student level (b = - 0.04, p < .001, ES = - 0.07). Overall bullying victimization was not significantly associated with school engagement (b = 0.04, p = .369, ES = .14). In addition, the comparison of the results of Model 3 and Model 5 shows that the main effects of overall bullying victimization on school engagement decreased at both the student level and the school level after the three factors representing the SEL approach were added in the model as predictors. The main effects of OBV, TS, SS, and SEL_I on school engagement at the student and school levels are illustrated in Figure 4.

As shown in Table 8, for the four sets of Models 5, the multilevel main effects of TS, SS, and SEL_I on school engagement had a similar pattern across the four bullying victimization scores. Differences in the coefficient estimates of the main effects on school engagement varied from 0.00 to 0.02 at the student level and from 0.00 to 0.10 at the school level. Thus, results based on the first set of Models 5, with overall bullying victimization as the predictor, are sufficient and appropriate to represent the multilevel main effects of TS, SS, and SEL_I on school engagement and it is not necessary to present results of each set of Models 5.

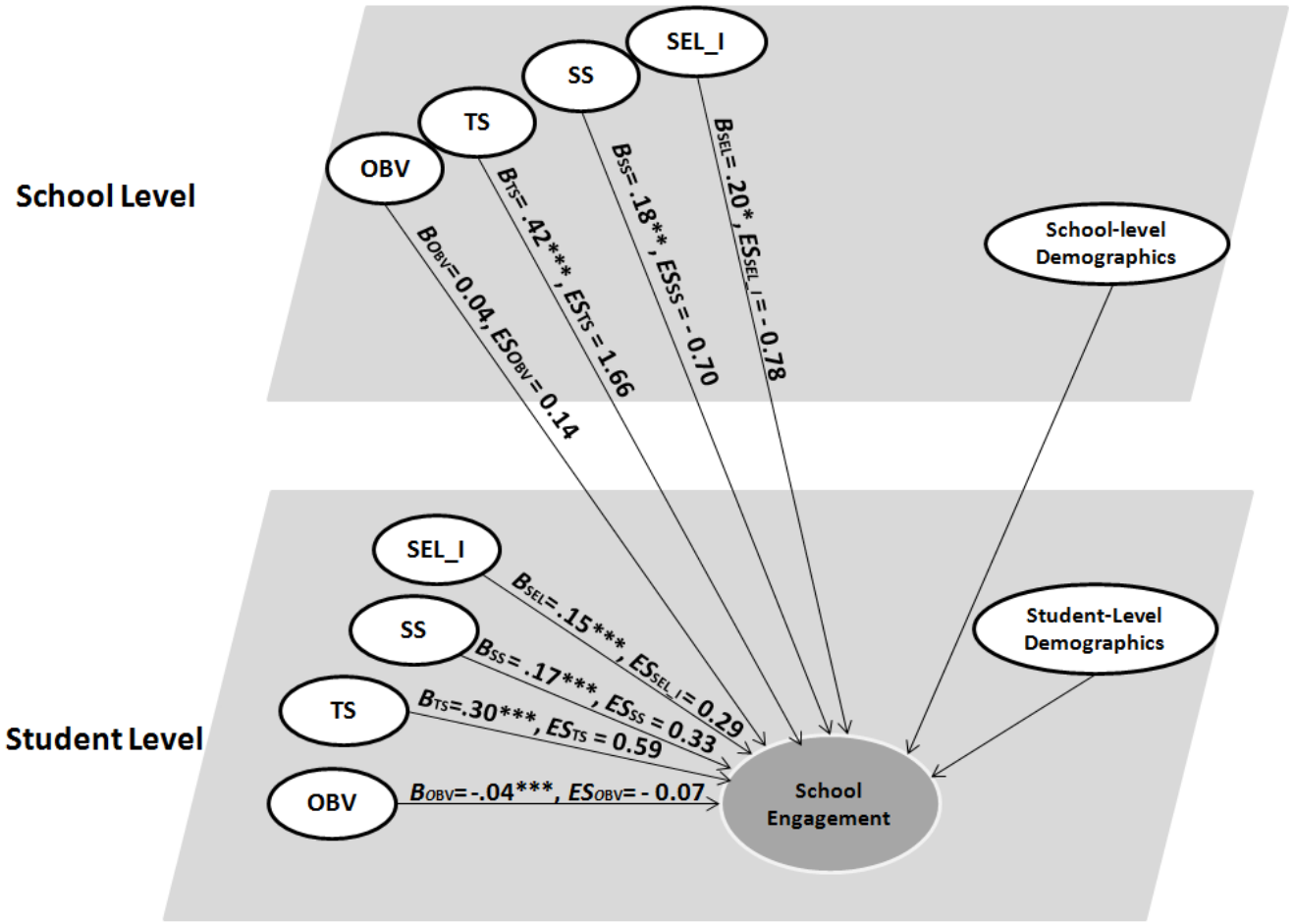

Figure 4 Multilevel Main Effects of Overall Bullying Victimization and SEL Approach on School Engagement

In summary, with student-level and school-level demographic factors statistically controlled, across the four sets of models of bullying victimization, bullying victimization was significantly associated with school engagement. Effect sizes were small at the student level and large at the school level. This was found irrespective of which one of the four different scores of bullying victimization was used. Likewise, irrespective of the types of bullying victimization score used, the main effects of TS, SS, and SEL_I were significant, with moderate effect sizes at the student level and large effect sizes at the school level. Moreover, at both the student and school levels the association between school engagement and TS, SS, and SEL_I was stronger than the association between school engagement and bullying victimization. Overall, the results of Models 3-5 support the hypothesis that school engagement is not only related to demographic factors but also to more malleable factors often targeted in interventions, such as factors related to the SEL approach (i.e., TS, SS, and SEL_I).

Research Question Three

The third main research question was: Does the SEL approach, which is represented by SS, TS, and SEL_I, moderate the association between bullying victimization and school engagement with individual-level and school-level demographic factors statistically controlled? To answer this research question, four sets of Models 6-7 were specified and tested in HLM to examine the multilevel moderation effects of TS, SS, and SEL instructional techniques in the association between bullying victimization and school engagement. In each set of Models 6-7, only one of the four different bullying victimization scores (i.e., OBV, PBV, VBV, and RBV) was included to represent the variable of bullying victimization.

Models 6 included:

1. Student-level demographics (i.e., gender and race/ethnicity) as student-level covariates;
2. School-level demographics (i.e., grade levels, school size, percentage of students receiving FRL, and the racial/ethnic diversity index of the student body of the school) as school-level covariates;
3. $BV_{\text{student level}}$, $TS_{\text{student level}}$, $SS_{\text{student level}}$, and $SEL_I_{\text{student level}}$ as student-level predictors;
4. $BV_{\text{school level}}$, $TS_{\text{school level}}$, $SS_{\text{school level}}$, and $SEL_I_{\text{school level}}$ as school-level predictors;
5. Three student-level interaction terms (i.e., $BV_{\text{student level}} \times TS_{\text{student level}}$, $BV_{\text{student level}} \times SS_{\text{student level}}$, and $BV_{\text{student level}} \times SEL_I_{\text{student level}}$) added as student-level predictors.

Models 7 included:

1. All of the variables in Models 6;
2. Three school-level interaction terms (i.e., $BV_{\text{school level}} \times TS_{\text{school level}}$, $BV_{\text{school level}} \times SS_{\text{school level}}$, and $BV_{\text{school level}} \times SEL_I_{\text{school level}}$) as school-level predictors;
3. $BV_{\text{school level}}$, $TS_{\text{school level}}$, and $SEL_I_{\text{school level}}$ added as predictors to the student-level regression slope between bullying victimization and school engagement to create three cross-level moderation terms: $BV_{\text{student level}} \times TS_{\text{school level}}$, $BV_{\text{student level}} \times SS_{\text{school level}}$, and $BV_{\text{student level}} \times SEL_I_{\text{school level}}$.

Student-Level, School-Level, and Cross-Level Interaction Terms in Models 6 and Models 7

At the student level, the three sets of interaction terms (i.e., $BV_{\text{student level}} \times TS_{\text{student level}}$, $BV_{\text{student level}} \times SS_{\text{student level}}$, and $BV_{\text{student level}} \times SEL_I_{\text{student level}}$) represent one of the four student-level bullying victimization scores (i.e., $OBV_{\text{student level}}$, PBV_{student}

$_{\text{level}}$, $VBV_{\text{student level}}$, and $RBV_{\text{student level}}$) multiplied by one of the three student-level scores representing the SEL approach (i.e., $TS_{\text{student level}}$, $SS_{\text{student level}}$, and $SEL_I_{\text{student level}}$). A high value indicates more frequent bullying victimization at the student level but also more positive teacher-student relationships, student-student relationships, or teachers' more frequent use of SEL instructional techniques at the student level. A low value indicates less frequent bullying victimization at the student level but also less positive teacher-student relationships, student-student relationships, or teachers' less frequent use of SEL instructional techniques at the student level.

At the school level, the three sets of interaction terms (i.e., $BV_{\text{school level}} \times TS_{\text{school level}}$, $BV_{\text{school level}} \times SS_{\text{school level}}$, and $BV_{\text{school level}} \times SEL_I_{\text{school level}}$) represent one of the four school-average bullying victimization scores (i.e., $OBV_{\text{school level}}$, $PBV_{\text{school level}}$, $VBV_{\text{school level}}$, and $RBV_{\text{school level}}$) multiplied by one of the three school-average scores representing the SEL approach (i.e., $TS_{\text{school level}}$, $SS_{\text{school level}}$, and $SEL_I_{\text{school level}}$). A high value indicates more frequent bullying victimization at the school level but also more positive teacher-student relationships, student-student relationships, or teachers' more frequent use of SEL instructional techniques reported at the school level. A low value indicates less frequent bullying victimization but also less positive teacher-student relationships, student-student relationships, or teachers' less frequent use of SEL instructional techniques reported at the school level.

The three sets of cross-level interaction terms (i.e., $BV_{\text{student level}} \times TS_{\text{school level}}$, $BV_{\text{student level}} \times SS_{\text{school level}}$, and $BV_{\text{student level}} \times SEL_I_{\text{school level}}$) represent one of the four bullying victimization scores of individual students (i.e., $OBV_{\text{student level}}$, $PBV_{\text{student level}}$, $VBV_{\text{student level}}$, and $RBV_{\text{student level}}$) multiplied by one of the three school-average scores representing the SEL approach (i.e., $TS_{\text{school level}}$, $SS_{\text{school level}}$, and $SEL_I_{\text{school level}}$). A

high value of the interaction term indicates more frequent bullying victimization reported at student level but also more positive teacher-student relationships, positive student-student relationships, or teachers' more frequent use of SEL instructional techniques reported at the school level. A low value indicates less frequent bullying victimization reported at the student level but also less positive teacher-student relationships, less positive student-student relationships, or teachers' less frequent use of SEL instructional techniques reported at school level.

Overall, these three sets of interaction terms described the conditions in which students or schools experienced more frequent bullying victimization reported at the student or school level, and also had more positive teacher-student relationships, student-student relationships, or teachers' frequent use of SEL instructional techniques. These three sets of interaction terms were defined to examine if the strengths and directions of the relationship between bullying victimization and school engagement varied depending on the students, and schools' capacity in applying the social-emotional learning approach, which was represented by teacher-student relationships, student-student relationships and teachers' use of SEL instructional techniques.

Following the specification of the four sets of Models 6-7 and the definition of the interaction terms, the four sets of Models 6-7 were examined in HLM. The proportions of change in variance in school engagement explained by the predictors and moderators added in Models 6 and Models 7 are presented in Table 6. A visual presentation of the student-level, school-level, and cross-level moderation effects in the association between overall bullying victimization and school engagement is

illustrated in Figure 5. The coefficient estimates, standard errors, significance level, and effect sizes of the main and moderation effects are illustrated in Table 9.

In the following sections, the results of the first set of Models 6 and 7 are presented in detail to illustrate the multilevel moderation effects of TS, SS, and SEL_I in the association between overall bullying victimization and school engagement. The variables included in both Models 6 and Models 7 generated mostly identical statistical results; thus, to avoid redundancy the results of the transitional Models 6 are not presented. Findings on the multilevel moderation effects of TS, SS, and SEL are summarized primarily based on the final Models 7. The patterns of the results across the four sets of models are then summarized to examine if the multilevel moderation effects varied depending on the bullying victimization score used.

Proportions of Change in Variance in School Engagement Explained by Predictors and Moderators Added in Models 6 and Models 7

As shown in Table 6, the proportions of change in variance in school engagement explained by predictors and moderators added in Models 6 and Models 7 were similar across the four sets of models irrespective of the bullying victimization scores used as a predictor. For models with overall bullying victimization as a predictor, the addition of the student- level interaction terms in Model 6 accounted for an additional 1.10% of the variance in school engagement at the student level beyond that accounted for in the previous models. The addition of school-level interaction terms and cross-level interaction terms in Model 7 accounted for an additional 1.12% of the variance in school engagement at the school level. Across the four sets of models, and at both the student and school levels, the addition of the three sets of moderation terms consistently explained a small proportion of change in variance in

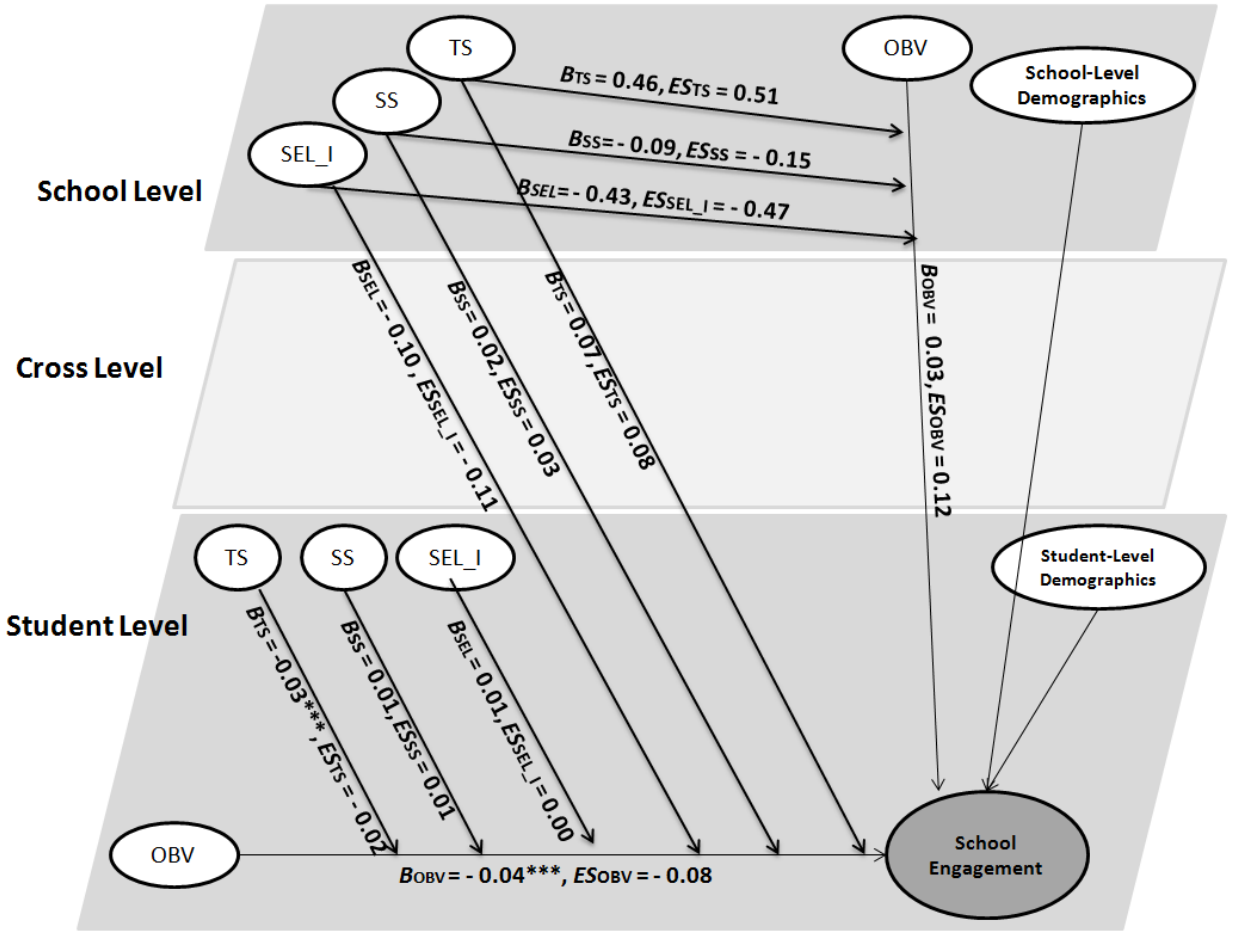

Figure 5 Multilevel Moderation Effects of the SEL Approach in the Association between Overall Bullying Victimization and School Engagement

Table 9 Statistical Estimates of Multilevel Main Effects of Demographic factors, Bullying Victimization, and the SEL Approach on School Engagement and the Multilevel Moderation Effects of the SEL Approach in the Association between Bullying Victimization and School Engagement in Models 7

	Overall BV[a]				Physical BV[a]				Verbal BV[a]				Relational BV[a]			
	Co.	*SE*	*p* value	*ES*[b]	Co.	*SE*	*p* value	*ES*[b]	Co.	*SE*	*p* value	*ES*[b]	Co.	*SE*	*p* value	*ES*[b]
Intercept of School Engagement	3.22	0.01	<.001	-	3.22	0.01	<.001	-	3.22	0.01	<.001	-	3.22	0.01	<.001	-
Student-Level Main Effects																
Gender																
Male vs. Female	0.06	0.01	< .001	**0.12**	0.06	0.01	< .001	**0.12**	0.07	0.01	< .001	**0.13**	0.07	0.01	< .001	**0.13**
Race																
Hispanic vs. AA	0.00	0.01	.793	0.01	0.00	0.01	.798	0.01	0.00	0.01	.754	0.01	0.00	0.01	.747	0.01
Caucasian vs. AA	0.01	0.01	.218	0.02	0.01	0.01	.353	0.02	0.01	0.01	.178	0.02	0.01	0.01	.223	0.02
Asian vs. AA	0.09	0.02	< .001	**0.18**	0.09	0.02	< .001	**0.18**	0.09	0.02	< .001	**0.19**	0.09	0.02	< .001	**0.18**
Others vs. AA	- 0.02	0.01	.138	- 0.03	- 0.02	0.01	.100	- 0.03	- 0.01	0.01	.162	- 0.03	- 0.02	0.01	.098	- 0.03
BV	- 0.04	0.00	< .001	**- 0.08**	- 0.03	0.01	< .001	**- 0.08**	- 0.03	0.00	< .001	**- 0.06**	- 0.03	0.00	< .001	**- 0.07**
TS	0.31	0.01	< .001	**0.60**	0.30	0.01	< .001	**0.60**	0.31	0.01	< .001	**0.60**	0.31	0.01	< .001	**0.60**
SS	0.17	0.01	< .001	**0.33**	0.18	0.01	< .001	**0.34**	0.17	0.01	< .001	**0.33**	0.17	0.01	< .001	**0.34**
SEL	0.15	0.01	< .001	**0.29**	0.15	0.01	< .001	**0.29**	0.15	0.01	< .001	**0.29**	0.15	0.01	< .001	**0.29**

Table 9 Continued.

Student-Level Moderation Effects																
$BV_{student\ level}$ × $TS_{student\ level}$	- 0.03	0.01	< .001	**- 0.02**	- 0.03	0.01	< .001	**- 0.03**	- 0.02	0.01	.017	**- 0.01**	- 0.02	0.01	< .001	**- 0.02**
$BV_{student\ level}$ × $SS_{student\ level}$	0.01	0.01	.220	0.01	0.01	0.01	.351	0.01	0.00	0.00	.607	0.00	0.01	0.01	.204	0.01
$BV_{student\ level}$× $SEL_I_{student\ level}$	0.01	0.01	.533	0.00	0.01	0.01	.273	0.01	0.00	0.01	.804	0.00	0.01	0.01	.491	0.00
School-Level Main Effects																
Grade Level Elementary vs. Middle	0.01	0.02	.593	0.05	0.01	0.02	.621	0.05	0.03	0.02	.541	0.06	0.02	0.02	.510	0.06
High vs. Middle	- 0.04	0.02	.026	**- 0.17**	- 0.04	0.02	.029	**- 0.18**	- 0.04	0.02	.029	**- 0.18**	- 0.04	0.02	.019	**- 0.18**
School Size	0.00	0.00	.629	0.00	0.00	0.00	.480	0.00	0.00	0.00	.695	0.00	0.00	0.00	.829	0.00
RFL	0.00	0.00	.281	0.00	0.00	0.00	.337	0.00	0.00	0.00	.368	0.00	0.00	0.00	.238	0.00
DI	- 0.05	0.05	.317	- 0.20	- 0.05	0.05	.346	- 0.19	- 0.05	0.05	.302	- 0.20	- 0.05	0.05	.319	- 0.20
BV	0.03	0.04	.487	0.12	0.01	0.05	.972	0.01	0.03	0.03	.416	0.11	0.06	0.04	.220	0.22
TS	0.46	0.08	< .001	**1.86**	0.46	0.08	< .001	**1.84**	0.46	0.08	< .001	**1.85**	0.46	0.08	< .001	**1.84**
SS	0.16	0.06	.005	**0.64**	0.15	0.05	.008	**0.58**	0.17	0.05	.003	**0.67**	0.17	0.05	.002	**0.70**
SEL_I	0.17	0.09	.047	**0.69**	0.19	0.09	.028	**0.76**	0.17	0.09	.057	0.67	0.16	0.09	.058	0.66

Table 9 Continued.

School-Level Moderation Effects																
$BV_{school\ level}$ x $TS_{school\ level}$																
$BV_{school\ level}$ x $SS_{school\ level}$	0.46	0.37	.214	0.51	0.32	0.43	.455	0.36	0.46	0.29	.108	0.52	0.44	0.38	.252	0.49
$BV_{school\ level}$ x $SEL_I_{school\ level}$	- 0.09	0.12	.448	- 0.15	- 0.10	0.13	.476	- 0.17	- 0.10	0.10	.332	- 0.17	- 0.05	0.13	.705	- 0.09
$BV_{school\ level}$ x $TS_{school\ level}$	- 0.43	0.33	.199	- 0.47	- 0.30	0.39	.443	- 0.33	- 0.42	0.26	.107	- 0.45	- 0.45	0.34	.191	- 0.49
Cross-Level Moderation Effects																
$BV_{student\ level}$ x $TS_{school\ level}$	0.07	0.07	.308	0.08	0.09	0.08	.286	0.09	0.05	0.05	.346	0.05	0.07	0.04	.295	0.08
$BV_{student\ level}$ x $SS_{school\ level}$	0.02	0.03	.530	0.03	0.01	0.03	.790	0.01	0.02	0.02	.362	0.03	0.03	0.03	.301	0.05
$BV_{student\ level}$ x $SEL_I_{school\ level}$	- 0.10	0.07	.147	- 0.11	- 0.12	0.08	.130	- 0.13	- 0.07	0.05	.168	- 0.08	- 0.09	0.07	.157	- 0.10

Note. Co = Coefficient; SE = standard error; ES = effect size; AA = African-American; FRL = Percentage of Students Receiving Free or Reduced-Price Lunch; DI = Racial/Ethnic Diversity Index; BV = Bullying Victimization.

[a]Statistical Estimates of Model 3 with Overall Bullying Victimization, or Physical Bullying Victimization, or Verbal Bullying Victimization, or Relational Bullying Victimization as the Predictor Representing Bullying Victimization.

[b]At the student level, the effect size of the main effect was calculated by dividing the main effect coefficient by 0.51, which was the student-level standard deviation of the random effect estimate in the unconditional model (Model 1). At the school level, the effect size of the main effect was calculated by dividing the coefficient by 0.25, which was the school-level standard deviation of the random effect estimate in the unconditional model (Model 1). At both levels, effect size of moderation effect is calculated by dividing the moderation effect coefficient by the standard deviation of the slope, which is calculated by multiplying the standard error of the corresponding moderator's main effect by the square root of the sample size (Lee, 1998).

[c] The main effects of the gender, race, and grade levels refer to the differences between the two compared groups. The comparison reference group for gender effect was male students; the comparison reference group for race/ethnicity effect was African-American student; and the comparison reference group for grade level effect was middle school students.

school engagement. This pattern indicates the potential small moderation effect of TS, SS, and SEL_I in the association between bullying victimization and school engagement. To quantify the moderation effects, the magnitude and statistical significance of the three sets of moderation effects were systematically examined. Results are presented in the following sections.

Student-Level Moderation Effects

As shown in Table 9, the moderation effect of $TS_{student\ level}$ in the association between $OBV_{student\ level}$ and school engagement was statistically significant (b = - 0.03, $p < .001$). However, despite the significance of the moderation effect, the magnitude was trivial (ES = - 0.02). With such small effect sizes, practical significance is minimal, and it may be that statistical significance was due to the large sample size of students. The trivial moderation effect of teacher-student relationships, as indicated by the coefficient estimates and the effect size, is consistent with the previously discussed finding that the addition of the student-level interaction term accounted for a very small portion of variance in school engagement.

The moderation effects are further illustrated in Figure 6, in which the average regression effects of overall bullying victimization in school engagement are presented with $TS_{student\ level}$ set at three levels: the 25th percentile, 50th percentile, and 75th percentile. As shown in Figure 6, although the moderation effect was statistically significant, the three regression lines are seemingly parallel to each other, which indicates that the direction and strength of the association between $OBV_{student\ level}$ and school engagement did not vary depending on the level of $TS_{student\ level}$. The discrepancies between the three seemingly parallel lines indicate that students with the

same level of overall bullying victimization tended to have higher school engagement when they perceived more positive teacher-student relationships.

As for the moderation effects of $SS_{\text{student level}}$ and $SEL_I_{\text{student level}}$ in the association between $OBV_{\text{student level}}$ and school engagement, the effects were not statistically significant and the effect sizes were trivial (for $OBV_{\text{student level}} \times SS_{\text{student level}}$: $b = 0.01$, $p = .220$, $ES = 0.01$; for $OBV_{\text{student level}} \times SEL_I_{\text{student level}}$: $b = 0.01$, $p = .533$, $ES = 0.00$). As depicted in Figure 7, students at the same levels of overall bullying victimization tended to have higher school engagement when they perceived more positive relationships with other students. However, the strength and direction of the negative association between overall bullying victimization and school engagement were the same for students perceiving different levels of student-student relationships. As depicted in Figure 8, students with the same level of overall bullying victimization also tended to have higher school engagement when they perceived more positive relationships with teachers. However, the strength and direction of the negative association between overall bullying victimization and school engagement were the same for students with different levels of teachers' use of SEL instructional techniques.

As shown in Table 9, when the four sets of Models 7 were compared, the moderation effects of $TS_{\text{student level}}$, $SS_{\text{student level}}$, and $SEL_I_{\text{student level}}$ showed a consistent pattern across the four bullying victimization scores. Specifically, the moderation effects of $TS_{\text{student level}}$ was consistently significant, with coefficients estimates ranging from 0.00 to 0.01 across the four versions of Models 7. The moderation effects $SS_{\text{student level}}$, and $SEL_I_{\text{student level}}$ were consistently nonsignificant ($p > .05$), with coefficient estimates ranging from 0.00 to 0.02 across the same four models. Visual

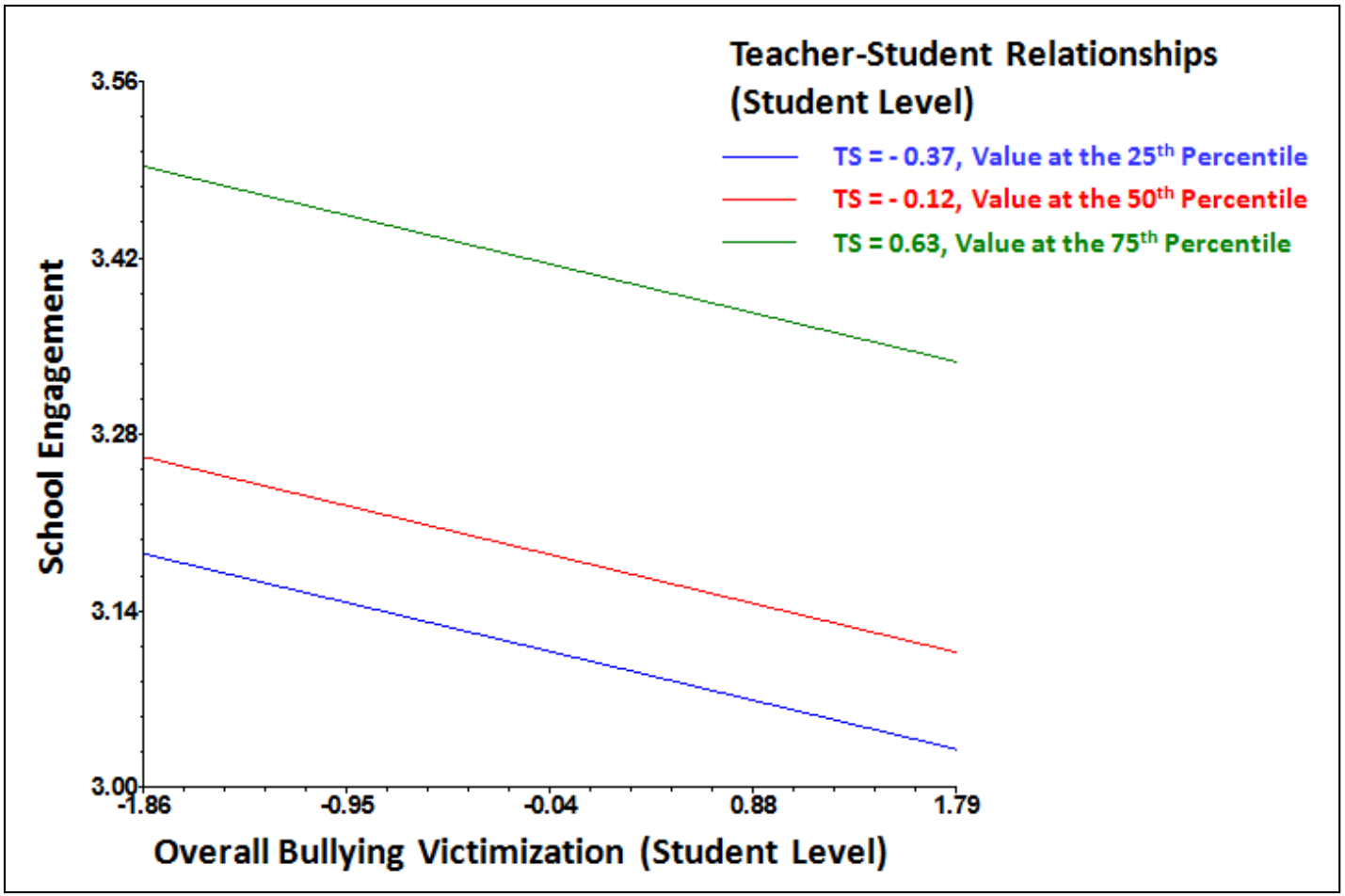

Figure 6 Moderation Effect of Teacher-Student Relationships (Student Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement

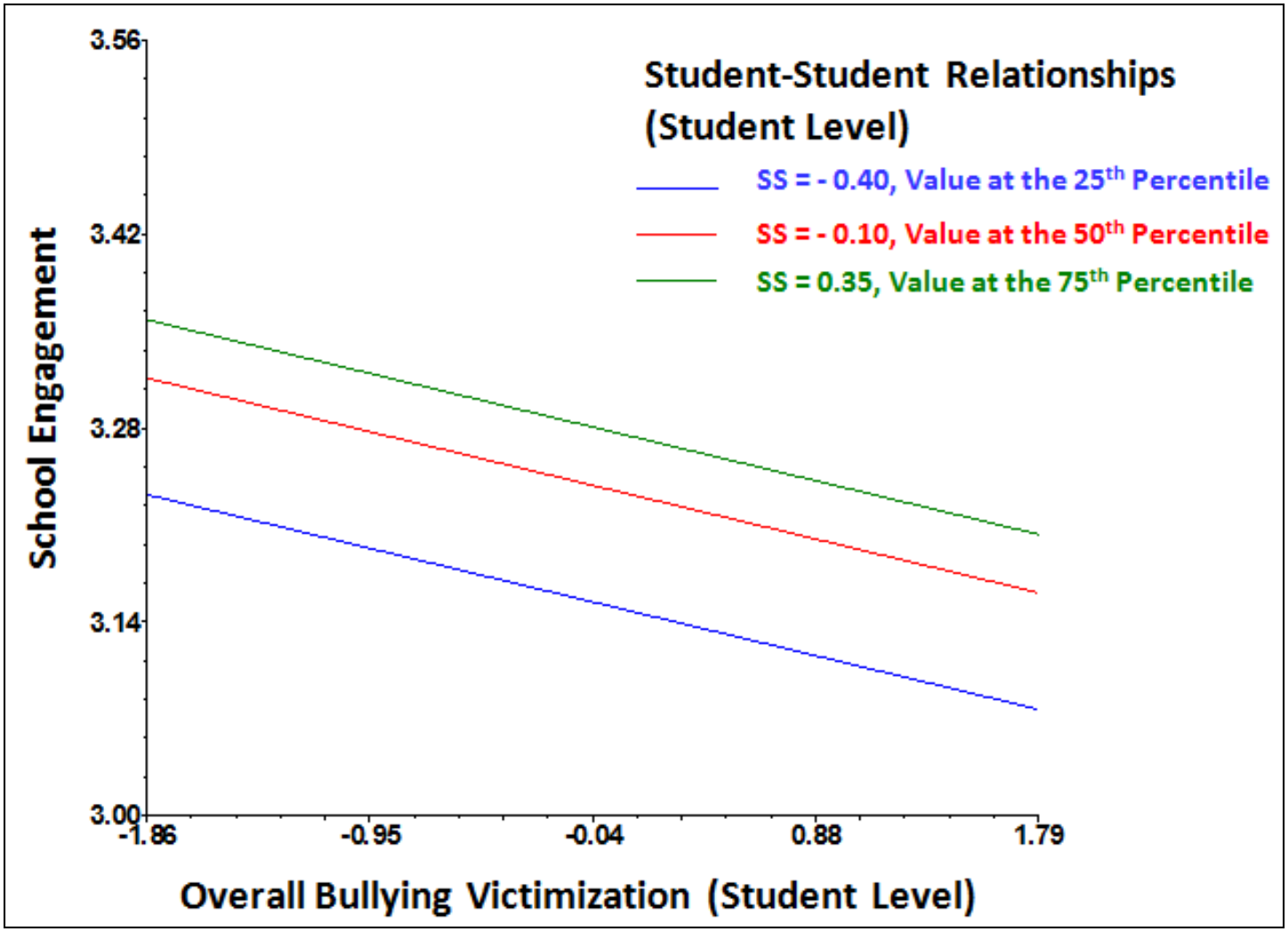

Figure 7 Moderation Effect of Student-Student Relationships (Student Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement

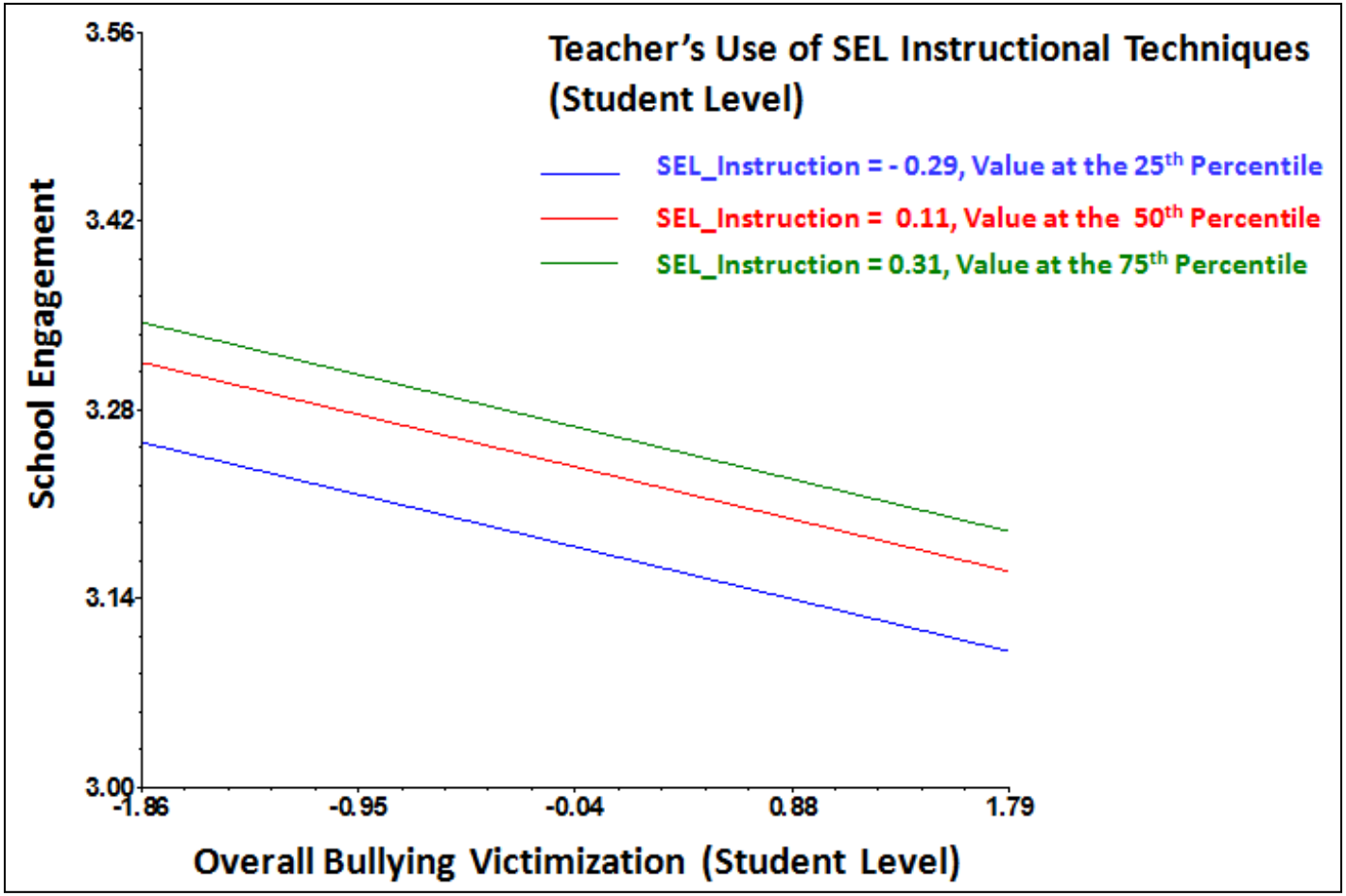

Figure 8 Moderation Effect of Teachers' Use of SEL Instructional Techniques (Student Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement

presentations of student-level moderation effects across four subtypes of bullying victimization indicate that the school-level moderation effects of $TS_{student\ level,}$ were consistently significant but not meaningful in practice across the subtypes of bullying victimization. The school-level moderation effects of $SS_{student\ level}$ and $SEL_Instruction_{student\ level}$ were neither significant nor meaningful across the subtypes of bullying victimization. Thus, the findings based on Model 7, with overall bullying victimization as the predictor, are sufficient and appropriate to represent themoderation effects of $TS_{student\ level}$, $SS_{student\ level,}$ and $SEL_I_{student\ level}$ and it is not necessary to present detailed results of each Model 7.

School-Level Moderation Effects

At the school level, results of Model 7 with overall bullying victimization as the predictor show that the coefficients of the three school-level interaction terms were not statistically significant ($OBV_{school\ level} \times TS_{school\ level}$: $b = 0.46$, $p = .214$; $OBV_{school\ level} \times SS_{school\ level}$: $b = -0.09$, $p = .448$; $OBV_{school\ level} \times SEL_I_{school\ level}$: $b = -0.43$, $p = .199$). However, the effect sizes of two moderation effects were moderate to large ($OBV_{school\ level} \times TS_{school\ level}$: $ES = .51$ and $OBV_{school\ level} \times SEL_I_{school\ level}$: $ES = -.47$) and the effect size of one moderation effect was small ($OBV_{school\ level} \times SS_{school\ level}$: $ES = -.15$), indicating that, although not statistically significant, they may nevertheless be of practical importance. The nonsignificant school-level moderation effects might be related to the fact that the power to detect the school-level moderation effects was quite low given the relatively small size of the school sample in comparison to the student sample.

To further interpret the nonsignificant moderation effects of $TS_{school\ level}$, $SS_{school\ level}$, and $SEL_I_{school\ level}$ and their small-to-large effect sizes, the regression

association between $OBV_{school\ level}$ and school engagement is graphed in Figures 9, 10, and 11, with the 25th, 50th, and 75th percentiles of the values of the three moderators (i.e., TS, SS, and SEL_I). Consistent with the nonsignificant statistical findings, the parallel lines in Figures 9, 10, and 11 suggest that the strength and direction of the association between the schools' overall bullying victimization and students' school engagement were the same for schools with different scores of $TS_{school\ level}$, $SS_{school\ level}$ and $SEL_I_{school\ level.}$ Moreover, the very small coefficient estimate of the nonsignificant association between $OBV_{school\ level}$ and school engagement (b = 0.03, p = .487) in Model 7, together with its small effect size (ES = 0.12), suggest that the association between $OBV_{school\ level}$ and school engagement is not meaningful in practice. The nonmeaningful association between $OBV_{school\ level}$ and school engagement, together with the visual evidences shown in Figures 9-11 and the nonsignficant coefficient estimates of the three school-level moderation terms, support that $TS_{school\ level}$, $SS_{school\ level}$, and $SEL_I_{school\ level}$ had no meaningful moderation effects in the association between $OBV_{school\ level}$ and school engagement. Although the meaningful moderation effects of TS, SS, and SEL were not found, the discrepancies among the three parallel lines in Figures 9-11 suggest that schools with the same level of overall bullying victimization have greater school engagement among their students when they have higher scores for $TS_{school\ level}$, $SS_{school\ level}$, and $SEL_I_{school\ level}$.

When the school-level moderation effects were compared across the four bullying victimization scores, the results show a generally consistent pattern. The moderation effects of $TS_{school\ level}$, $SS_{school\ level}$, and $SEL_I_{school\ level}$ were consistently nonsignificant (p > .05), with the differences of the coefficient estimates ranging from 0.00 to 0.15. The effect sizes of the moderation effects ranged from medium to large

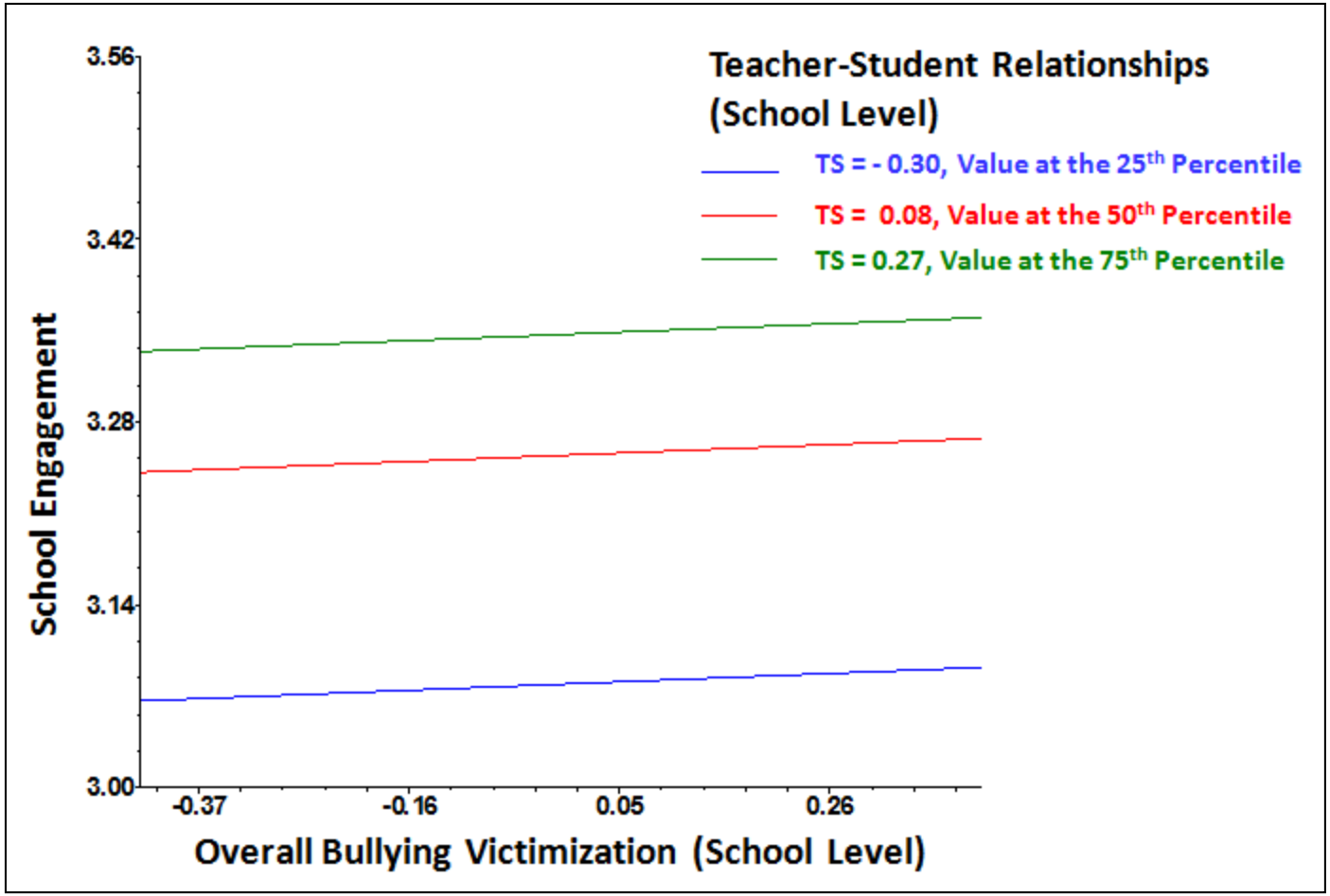

Figure 9 Moderation Effect of Teacher-Student Relationships (School Level) in the Association between Overall Bullying Victimization (School Level) and School Engagement

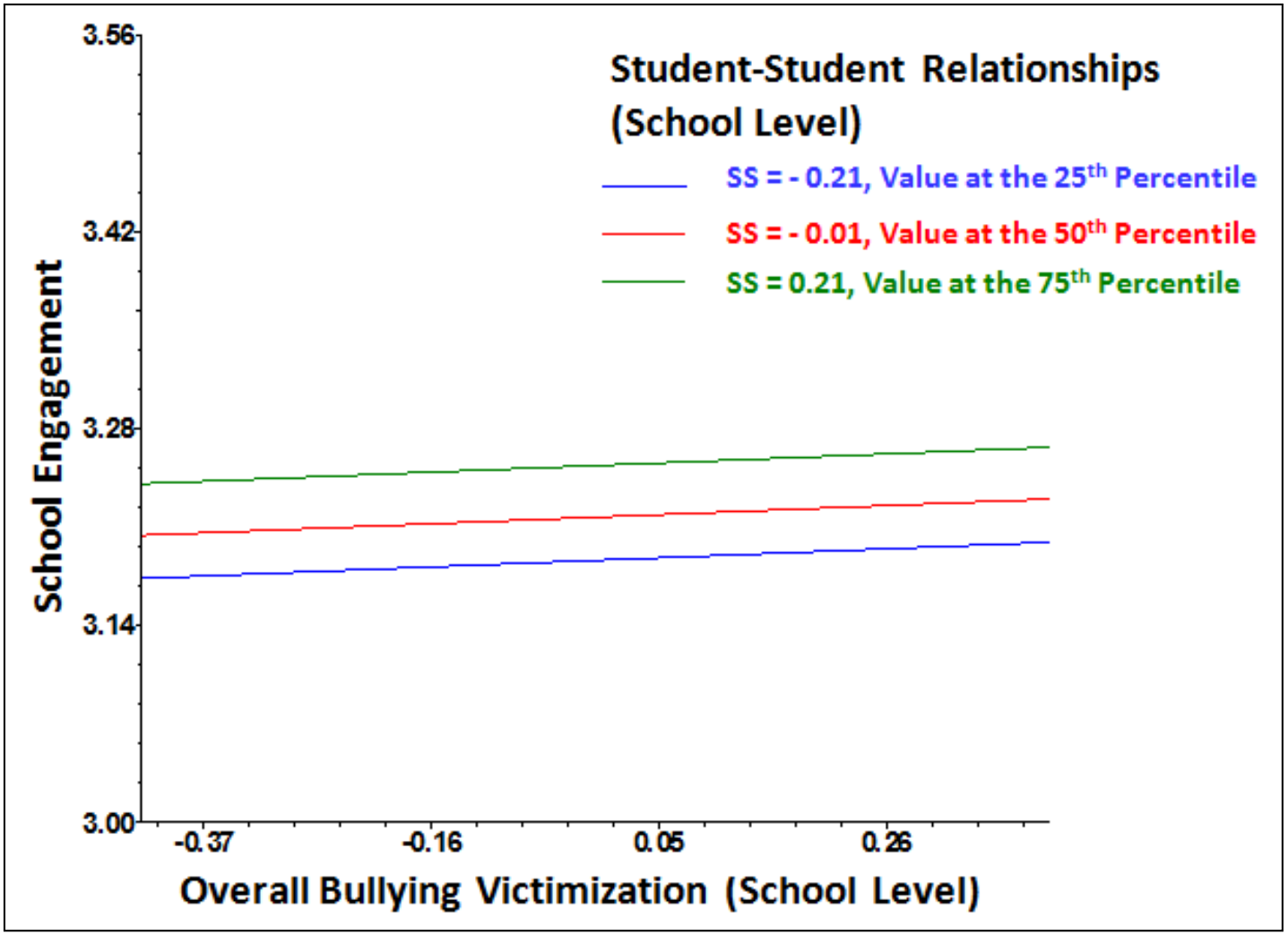

Figure 10 Moderation Effect of Student-Student Relationships (School Level) in the Association between Overall Bullying Victimization (School Level) and School Engagement

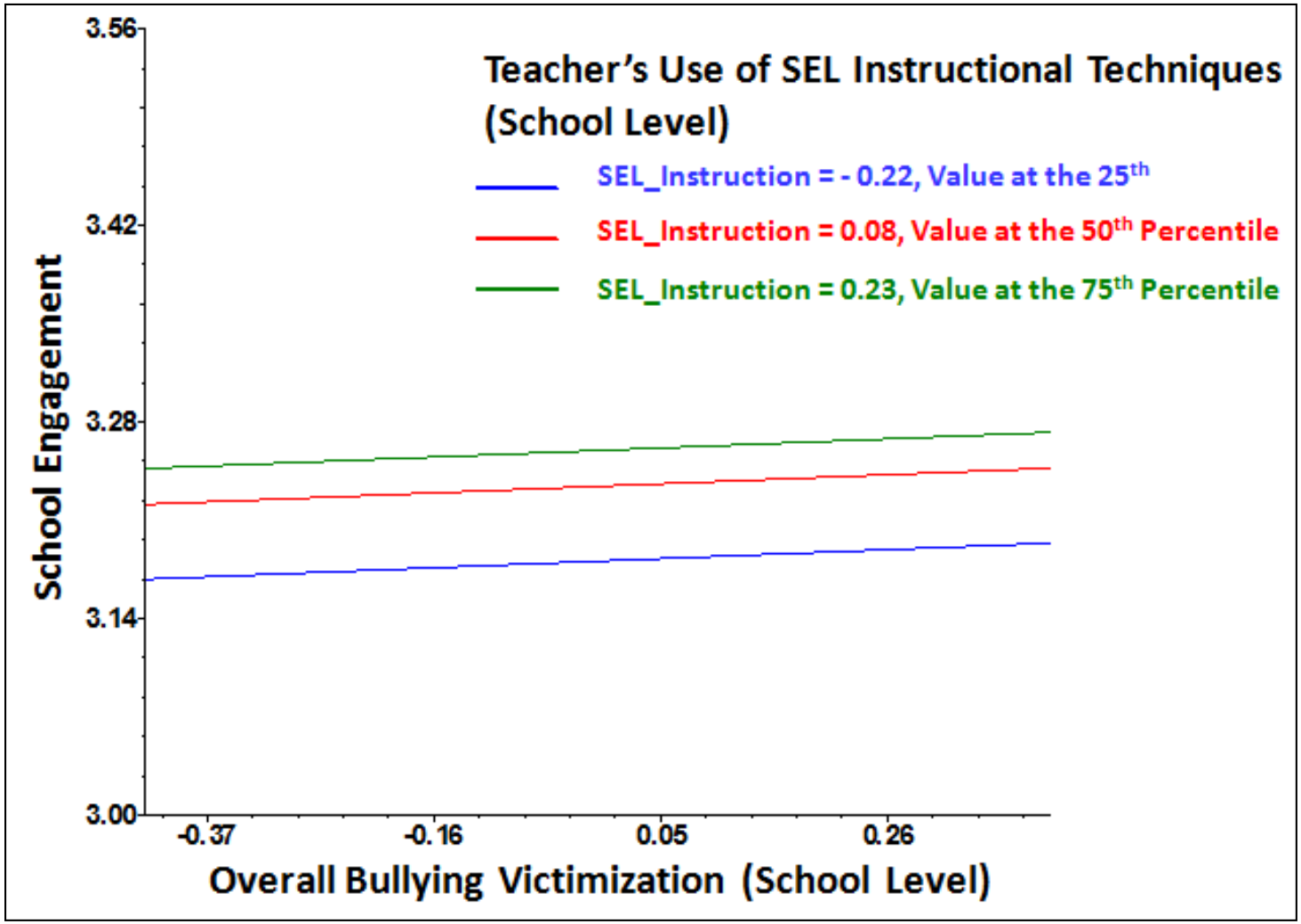

Figure 11 Moderation Effect of Teachers' Use of SEL Instructional Techniques (School Level) in the Association between Overall Bullying Victimization (School Level) and School Engagement

for $TS_{school\ level,}$ from trivial to small for $SS_{school\ level}$, and were consistently moderate for $SEL_I_{school\ level}$. Visual presentations of school-level moderation effects across the four subtypes of bullying victimization indicate that the school-level moderation effects of $TS_{school\ level,}$ $SS_{school\ level}$, and $SEL_\ Instruction_{school\ level}$ were consistently neither significant nor meaningful across the subtypes of bullying victimization. Thus, based on Model 7 with overall bullying victimization as the predictor, findings are sufficient to represent the school-level moderation effects of the SEL approach.

Cross-Level Moderation Effects

As for cross-level moderation effects, results in Model 7 show that the three variables representing the school-level SEL approach (i.e., $TS_{school\ level}$, $SS_{school\ level}$, and $SEL_I_{school\ level}$) did not significantly moderate the association between $OBV_{student\ level}$ and school engagement ($OBV_{student\ level} \times TS_{\ school\ level}$: $b = 0.07$, $p = .308$, $ES = 0.08$; $OBV_{student\ level} \times SS_{school\ level}$: $b = 0.02$, p = .530, $ES = 0.03$; $OBV_{student\ level} \times SEL_I_{school\ level}$: $b = -0.10$, p = .147, $ES = -0.11$), with effect sizes ranging from trivial to small.

Although the cross-level moderation effect of $TS_{school\ level}$ was not statistically significant ($b = 0.07$, $p = .308$) and its effect size was trivial ($OBV_{student\ level} \times TS_{school\ level}$: ES = 0.08), when the cross-level moderation effect is graphed out with the 25^{th}, 50^{th}, and 75^{th} percentiles of the values of $TS_{school\ level}$, the three seemingly nonparallel lines shown in Figure 12 indicate that the moderation effect of $TS_{school\ level}$ is potentially meaningful in practice. More specifically, Figure 12 indicates that the negative effect of $TS_{school\ level}$ on school engagement was mitigated in schools with higher $TS_{school\ level}$. In other words, students' perceptions of school-wide positive teacher-student relationships were associated with weaker negative effect of bullying victimization on school engagement. In addition, the three lines in Figure 12 suggest

that higher $TS_{\text{school level}}$ scores were associated with higher school engagement scores across nearly all levels of overall bullying victimization at the student level.

The cross-level moderation effect of $SS_{\text{school level}}$ was not statistically significant ($b = 0.02$, $p = .530$, $ES = 0.03$) and its effect size was trivial ($OBV_{\text{student level}} \times SS_{\text{school level}}$: $ES = 0.03$). Moreover, when the cross-level moderation effect of $SS_{\text{school level}}$ is graphed out with the 25th, 50th, and 75th percentiles of the values of $SS_{\text{school level}}$, the three seemingly nonparallel lines in Figure 13 indicate that the moderation effect of $TS_{\text{school level}}$ is not meaningful in practice. More specifically, Figure 13 indicates that the negative effect of $OBV_{\text{student level}}$ on school engagement was the same in schools at different levels of $SS_{\text{school level}}$. In other words, students' perceptions of school-wide positive student-student relationships were not associated with the level of the negative effect of bullying victimization on school engagement at the student level. In addition, the three parallel lines in Figure 13 suggest higher $SS_{\text{school level}}$ scores were associated with higher school engagement scores across nearly all levels of overall bullying victimization at the student level.

Although the cross-level moderation effect of $SEL_I_{\text{school level}}$ was not statistically significant, it approached statistical significance, with a p value of .147. The effect size was small ($OBV_{\text{student level}} \times SEL_I_{\text{school level}}$: $ES = -0.11$). Moreover, as shown in Figure 14, when the cross-level moderation effects are graphed with the 25th, 50th, and 75th percentiles of the values of $SEL_I_{\text{school level}}$, the three nonparallel lines in Figure 14 suggest that the moderation effect of $SEL_I_{\text{school level}}$ is potentially meaningful in practice. More specifically, Figure 14 shows that the negative effect of $OBV_{\text{student level}}$ on school engagement was intensified in schools with higher scores on $SEL_I_{\text{school level}}$. In other words, students' perceptions of teachers' more frequent use of

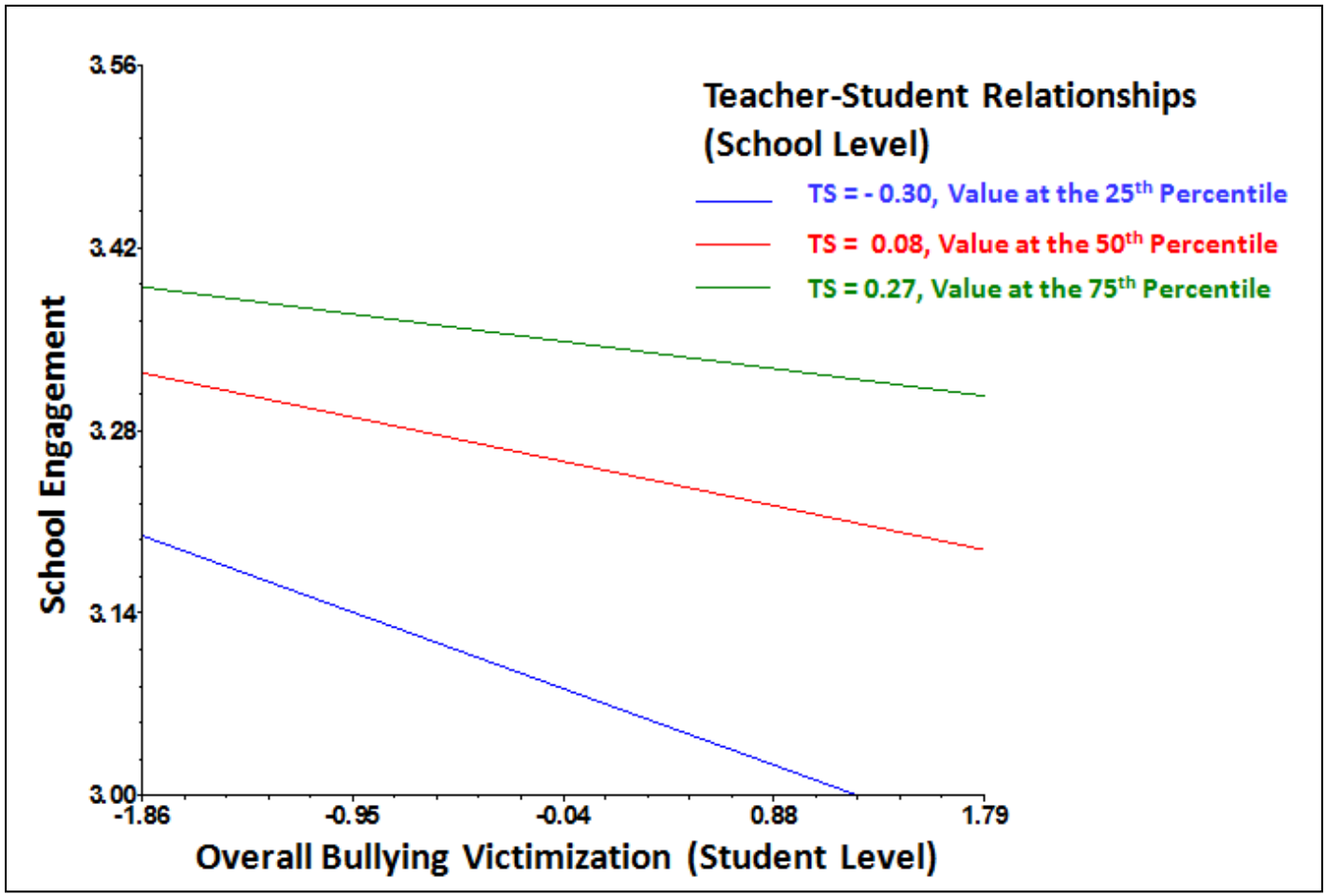

Figure 12 Moderation Effect of Teacher-Student Relationships (School Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement

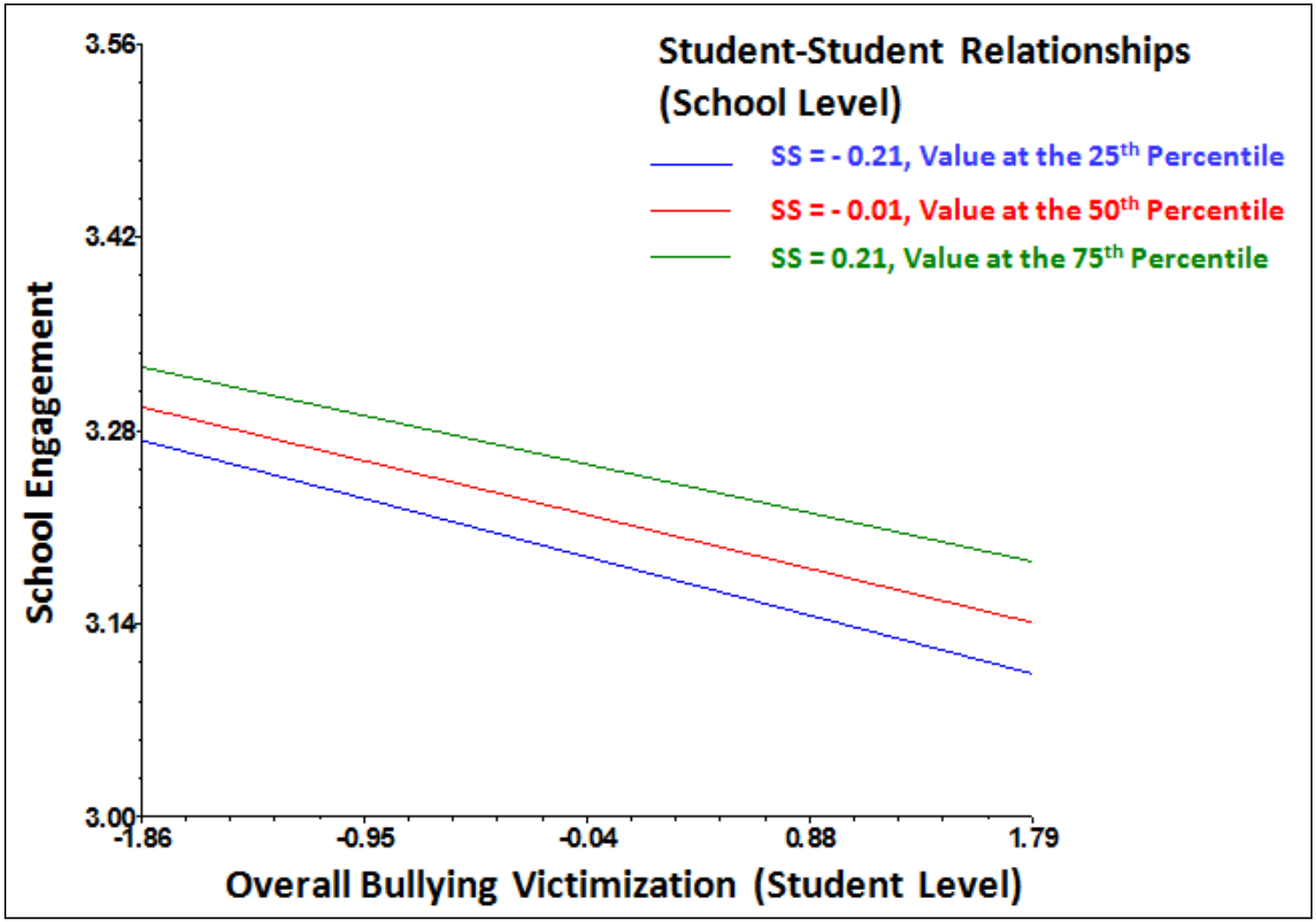

Figure 13 Moderation Effect of Student-Student Relationships (School Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement

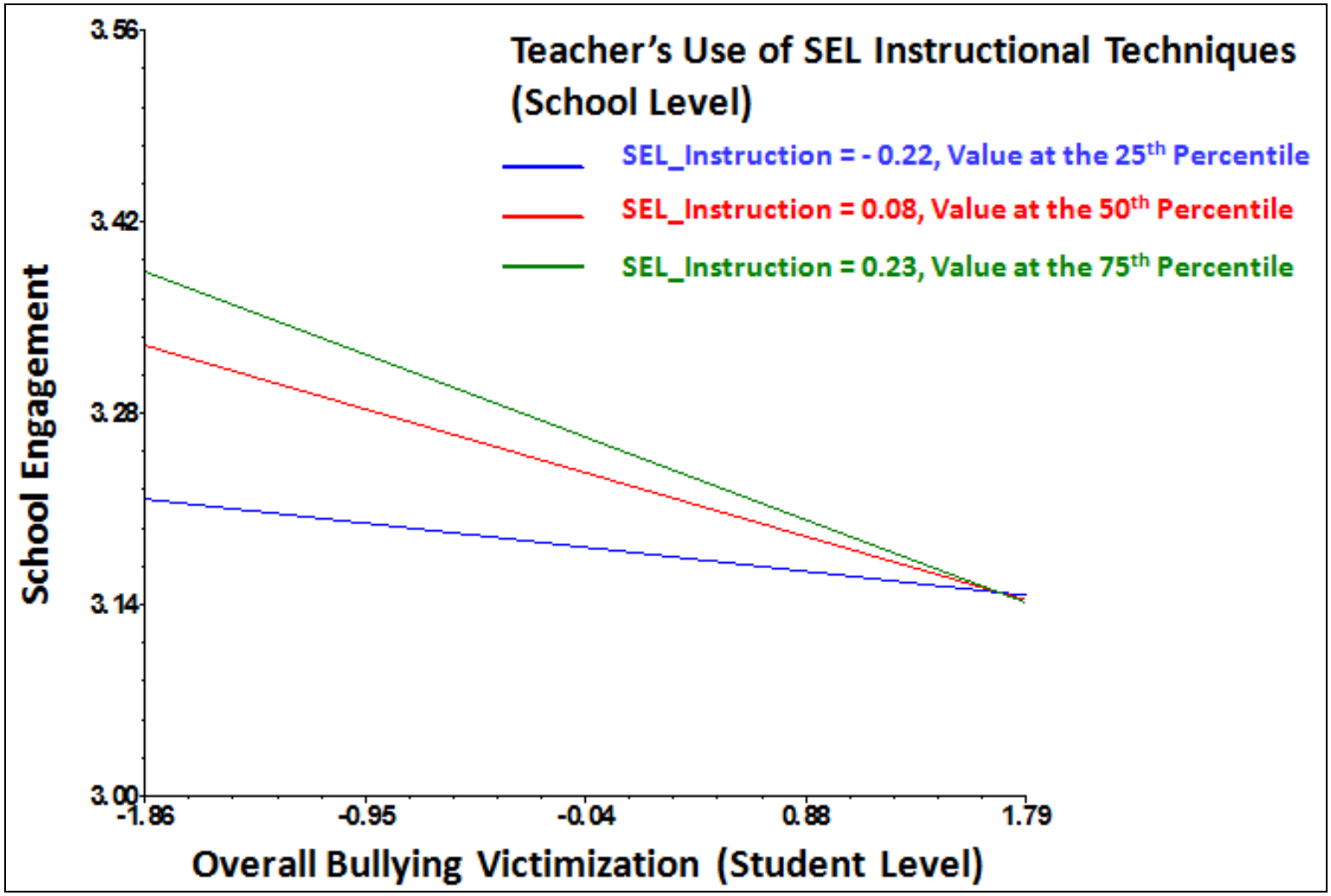

Figure 14 Moderation Effect of Teachers' Use of SEL Instructional Techniques (School Level) in the Association between Overall Bullying Victimization (Student Level) and School Engagement

SEL instructional techniques school-wide were associated with a stronger negative relationship between bullying victimization and school engagement at the student level. In addition, the three lines in Figure 14 suggest that higher $SEL_I_{school\ level}$ scores were associated with higher school engagement scores across nearly all levels of overall bullying victimization at the student level.

When the cross-level moderation effects were compared across the four types of bullying victimization scores, results showed that the moderation effects of $TS_{school\ level}$, $SS_{school\ level,}$ and $SEL_I_{school\ level}$ were consistently nonsignificant ($p > .05$), with the differences in the coefficient estimates ranging from 0.00 to 0.05. The effect sizes for cross-level moderation of $TS_{school\ level}$ and $SS_{school\ level}$ were trivial (*ES*s < 0.10), with the differences of magnitudes ranging from 0.00 to 0.04. Likewise, the effect sizes for cross-level moderation of $SEL_I_{school\ level}$ were trivial to small, with *ES*s ranging from - 0.08 to - 0.13 and the differences of magnitudes ranging from 0.01 to 0.05. Visual presentations of cross-level moderation effects across four subtypes of bullying victimization indicated that the potentially meaningful moderation effects of $TS_{school\ level}$ and $SEL_\ Instruction_{school\ level}$ were consistent across the subtypes of bullying victimization; no meaningful cross-level moderation effect for $SS_{school\ level}$ was shown in visual presentations with different subtypes of bullying victimization.

In summary, three types of moderation effects (i.e., student-level, school-level and cross-level moderation effects) were examined to address the third main research question. Results show that the moderation effects of $TS_{student\ level}$ in the student-level associations between bullying victimization and school engagement were statistically significant. However trivial effect sizes and the visual presentation in Figure 6 indicate that the moderation effects were not meaningful in practice. Moreover, the visual presentations in Figures 12 and 14 indicate that the cross-level moderation effects of

$TS_{school\ level}$ and $SEL_I_{school\ level}$ in the student-level association between bullying victimization and school engagement were potentially meaningful in practice, although they were not statistically significant. That is, the negative effect of bullying victimization on school engagement at the student level is potentially mitigated by students' perceptions of the school-wide positive teacher-student relationships. In contrast, the negative effect of bullying victimization on school engagement is potentially intensified in schools by students' perception of teachers' more frequent use of SEL instructional techniques school-wide. Regardless of the different moderation effects, the visual presentations in Figures 6-14 also suggest that higher TS, SS, and SEL_I scores at both the student and school levels were all associated with higher school engagement scores across nearly all levels of overall bullying victimization at both the student and school levels. In addition, the findings about the multilevel moderation effects were consistent across subtypes of bullying victimization.

Chapter 4

DISCUSSION

This study investigated the multilevel main effects of student-level and school-level demographic factors, and the multilevel main effects of bullying victimization and the social-emotional learning (SEL) approach on students' perceptions of school engagement. It also investigated the multilevel moderation effects of the SEL approach in the association between bullying victimization and school engagement. The SEL approach was represented by three factors: teacher-student relationships (TS), student-student relationships (SS), and teachers' use of SEL instructional techniques (SEL_I).

Results of correlational and hierarchical linear regression analyses showed that the effects of students' gender and race/ethnicity and schools' grade level and percentage of students receiving FRL on school engagement were statistically significant, with effect sizes ranging from trivial to large. Although the effect of a school's racial/ethnic diversity index on school engagement was not statistically significant, its effect size was moderate. Perhaps more importantly, at both the student level and school level results also showed that bullying victimization had a significant and negative association with school engagement after controlling for student-level and school-level demographic factors. The association was stronger at the school level, however. With respect to the multilevel effects of students' perceptions of the SEL approach on school engagement, results showed that a significant and positive association after controlling statistically for student-level and school-level

demographic factors and bullying victimization. Again, that was found at both the student level and school level, with the association being stronger at the school level.

When three types of moderation effects (i.e., student-level moderation effects, school-level moderation effects, and cross-level moderation effects) were examined, the cross-level moderation effects of school-level TS ($TS_{\text{school level}}$) and school-level SEL_I ($SEL_I_{\text{school level}}$) in the student-level association between bullying victimization and school engagement were found to be potentially meaningful in practice, although they were not statistically significant. That is, the negative effect of bullying victimization on school engagement at the student level appears to be mitigated by students' perceptions of school-wide positive teacher-student relationships. In contrast, the negative effect of bullying victimization on school engagement appears to be intensified in schools by students' perceptions of teachers' more frequent use of SEL instructional techniques school-wide. The multilevel main effects of bullying victimization and the SEL approach and the potential cross-level moderation effects of $TS_{\text{school level}}$ and $SEL_I_{\text{school level}}$ were found to be generally consistent across subtypes of bullying victimization. These findings are discussed below, followed by a discussion of their practical implications, limitations, and directions for future studies.

Interpretations of Findings

Multilevel Main Effects of Demographic Factors on School Engagement

The effects of the following demographic factors on school engagement were examined: (a) gender and race/ethnicity of students and (b) the grade level (i.e., elementary, middle, and high school), school size (i.e., enrollment), percentage of students receiving FRL, and the racial/ethnic diversity index of schools. Results indicate that the gender and race/ethnicity of students and the grade level of schools

are significantly associated with school engagement, with effect sizes ranging from small to large. The association between the racial/ethnic diversity of a school's student body and school engagement warrants some qualification, however, in that although the effect size was found to be moderate, it was not statistically significant. A school's percentage of students receiving FRL was found to be significantly associated with school engagement, but the effect size was negligible, suggesting the lack of a meaningful relationship between these two variables. Finally, results indicate that school size is not significantly related to school engagement, in light of finding the effect size being negligible. In the following paragraphs, theories and previous research findings are reviewed and discussed in interpreting the above results.

Gender

Results show that female students report greater school engagement than male students. This is consistent with Crosnoe and colleagues' (2004) finding that compared to male students, female students tend to be more strongly other-oriented, more sensitive to the quality of relationships, and more likely to seek social support. A common finding in the research literature is that female students, compared to male students, have stronger orientations toward relationships, stronger connections with others and schools, and greater school engagement (Gilligan, 1982; Johnson, Crosnoe, & Thaden, 2006; Sánchez, Colón, & Esparza, 2005). However, in most studies gender differences in school engagement are investigated at, and not across, specific grade or age levels. In the present study, when gender differences in school engagement were examined at three different grade levels, it was found that female students reported significantly greater school engagement than male students in elementary and middle schools, but not in high schools. However, the effect size of the gender differences in

middle schools was negligible; thus, it was only in elementary schools that gender differences were found to be both statistically significant and practically meaningful.

The findings of the current study are consistent with those of Mark (2000), in indicating that the greatest gender differences in school engagement exist in elementary schools, with female students more engaged. However, they also are inconsistent with those of Mark in finding statistically significant but not practically meaningful gender differences in middle school. Moreover, finding nonsignificant gender differences in high school fails to support the findings of several other studies in which researchers concluded that that gender reversal exists in important domains of social and emotional functioning (Ge et al., 2001; Nolen-Hoeksema, 1994). According to Johnson et al. (2006), during early childhood and early adolescence girls tend to be better adjusted than boys in social-emotional domains, but this pattern begins to reverse in mid-adolescence, with older boys demonstrating better social-emotional adjustment than girls throughout the high school years.

Finding little support for the gender reversal phenomenon might be attributed to the fact that the measure of school engagement used in the current study assessed both the social-emotional domain and the behavioral-cognitive domain of school engagement. It is plausible that whereas female students in middle school demonstrate higher engagement in both domains; in high school they fall below males in the social-emotional domain but still maintain advantages in the behavioral-cognitive domain, such as by demonstrating higher academic performance (Crosnoe, Johnson, & Elder, 2004).

Race/ Ethnicity

Results indicate among all the racial/ethnic groups (i.e., Caucasian, African-American, Hispanic/Latino, Asian, and Other race/ethnicity including multi-racial/ethnicity), Asian students report the highest school engagement. In contrast, students who identify themselves as "Other race/ethnicity including multi-racial/ethnicity" report the lowest school engagement. Caucasian students report the second highest school engagement, followed by Hispanic/Latino and African American students. These findings are partially consistent with Jennings' (2003) findings and interpretations about the racial/ethnic differences of school participation. School participation is considered as one of two main dimensions of school engagement, with the other being school identification (Jennings, 2003). Jennings argued that African-Americans' school particpation might be constrained by their perceptions that experiences outside of school are as important as activities within the school (Huang & Waxman, 1995; Jennings, 2003). Jennings (2003) also argued that Hispanic/Latino students' school participation could be constrained by the social isolation they experience as language learners and their perceptions of limited opportunities.

Inconsistent with the present finding that Asian American students report the highest level of school engagement, Jennings (2003) found that Asian American students report less school participation than Caucasian students. She further argued that Asian American students' perceptions of participation in school might be influenced by the higher familial value placed on academic activities over peer-related activities. The different findings in Jennings' study and the present study might be related to the fact that the measure of school participation in Jennings' study emphasized students' actual participation in peer-related activities, whereas the

measure of school engagement in the present study was based on students' self-reported and subjective perceptions of their emotional and cognitive/behavioral engagement in schools. Thus, school engagement reported by Asian American students in the current study tended to be higher, reflecting their stronger value in engaging in school academically.

Grade Level

Results indicate that elementary school students report greater school engagement than middle and high school students, and that high school students report the least school engagement across the three grade levels. Less school engagement at the secondary school level resonates with the reported statistics that 40% to 60% of secondary school students experience chronic disengagement, with this estimate excluding repeated absentees and dropouts (Sedlak, 1986; Steinberg, Brown, & Dornbusch, 1996). The general declining pattern of school engagement from elementary to secondary school might be attributed to a potential mismatch between students' developmental stage in middle and high school and the school environment. More specifically, compared to elementary students, many middle and high school students have fewer opportunities to develop strong and positive personal relationships, especially with teachers and classmates (Eccles, et al., 1993a; Wang & Eccles, 2012). Studies also show that with advancing age intrinsic motivation decreases and students tend to feel increasingly alienated from learning (Harter, 1981).

The effect sizes and coefficient estimates of grade level differences on school engagement across three grade levels suggest that students experience greater decline in school engagement during their transition from elementary to middle school than from middle school to high school. Similar to the declining pattern in school

engagement, a significant decline in students' perceptions of school climate also is often cited in the literature (Yang et al., 2013). Researchers argue that the declining pattern of students' perceptions of school engagement and school climate is largely attributed to increasing systemic change in school environments from elementary to secondary school, especially from elementary to middle school. In comparison to elementary schools, in middle and high schools there is less task structure, increased social control and social comparisons, greater academic standards and expectations, and less quality in teacher-student and student-student relationships (Eccles et al., 1993b; Yang et al., 2013). In comparison to the transition from elementary to middle school, however, the transition from middle school to high school is less salient.

School Size

School size was not found to be related to school engagement. A nonsignificant relationship between school size and students' sense of school community also was reported by Battistich, Solomon, Watson, and Schaps (1997). However, in another study based on the findings of the National Longitudinal Study of Adolescent Health (Resnick et al., 1997), McNeely, Nonnemaker, and Blum (2002) found that, in general, smaller school size is positively associated with engagement, but that schools with less than 300 students have a "less than optimal" learning environment. Moreover, Weiss et al. (2010) found that a moderate school size provides the greatest engagement advantage for all students and that there are potentially harmful changes when schools grow beyond 400 students. Similarly, researchers (Lindsay, 1982; Newman, Wehlage, & Lamborn, 1992) found that students and teachers in schools with small-to-moderate size experience both a greater "sense of community" as well as higher ratings of satisfaction when compared to

students in larger schools. Based on such findings, it is likely that the relationship between school size and school engagement is nonlinear, and there is a point or multiple points at which school size changes the strength and direction of its association with school engagement. In addition, in the current study the nonsignificant association between school size and school engagement might be related to the sample's restricted range and skewed distribution. A large portion of schools (71 out of 114 schools) were elementary schools, which generally had smaller school sizes than middle and high schools.

Percentage of Students Receiving Free or Reduced-Price Lunch

A school's percentage of students receiving free or reduced-priced lunch (FRL) was used as a measure of the SES status of schools. The negative association between the percentage of students receiving FRL in schools and school engagement was found to be statistically significant, with trivial effect size trivial. This finding is consistent with studies (Johnson et al., 2001; Li & Lerner, 2011) reporting a negative correlation between SES and school engagement. However, the trivial effect size indicates that the association between FRL and school engagement is not meaningful in practice, which is consistent with the results of other studies (Briefel, Crepinsek, & Cabili, 2009; Finkelstein, Hill, & Whitaker, 2008). The trivial effect size might be related to several factors. One is that FRL is not driving school policies/practices related to the promotion of school engagement. Instead, other factors such as state and/or district requirements, geography, and urban/rural distinctions may be more important than FRL (Taber, Chriqui, Powell, & Chaloupka, 2013). Moreover, it is possible that some subset of schools in the study exhibited a negative correlation, and therefore, a statewide sample might mask the relationship. Additionally, researchers

have questioned if FRL provides a valid measure of SES status (Nicholson, Slater, Chriqui, & Chaloupka, 2014). For example, some researchers argue that FRL is based on an outdated poverty index and does not adequately capture all economic elements that are relevant today, such as the effects of concentrated neighborhood poverty (Kurki, Boyle, & Aladjem, 2005) or students' access to economic resources (Harwell & LeBeau, 2010).

A School's Racial/Ethnic Diversity Index of Its Student Body

A school's racial/ethnic diversity index of its student body was not found to be statistically significant in its relationships to school engagement. However, a moderate effect size was found. A positive effect of school diversity on school engagement is supported in other empirical studies. For example, reviews of desegregation research highlight the benefits of integrated schools for African American and Latino children's learning and orientation to education (Ferguson & Mehta, 2004; Schofield, 1995). Other studies outside the desegregation literature also suggest that diverse school contexts can lead to learning gains among children. For example, Borman, Eitle, Michael, Eitle, and Lee (2004) found that reading and math test scores are higher in more diverse elementary schools than in predominantly African American schools. This was found after statistically controlling for differences in per pupil expenditures, instructional quality, classroom size, mobility, school socioeconomic status, and other school-level factors. Similarly, Summers and Wolfe (1977) reported that sixth graders perform best academically in schools with a mix of racial/ethnic groups. Beyond K-12 schools, research also indicates that university students in more racially/ethnically diverse institutions tend to have greater engagement and motivation and better academic performance, in part because they are more frequently challenged to

critically analyze their own assumptions about the world and to integrate a variety of worldviews (Antonio et al., 2004; Gurin, Dey, Gurin, & Hurtado, 2003; Tam & Bassett, 2004).

Multilevel Main Effects of Demographic Factors, Bullying Victimization, and the SEL Approach on School Engagement

With student-level and school-level demographic factors statistically controlled, bullying victimization was found to be significantly associated with school engagement, irrespective of the type of bullying victimization (i.e., OBV, PBV, VBV, and RBV). Effect sizes were small at the student level and large at the school level. When the multilevel main effects of bullying victimization, TS, SS, and SEL_I on school engagement were concurrently examined with demographic factors statistically controlled, the main effects of TS, SS, and SEL_I on school engagement were significant at the student level (moderate-to-large effect sizes) and also at the school level (large effect size). Moreover, the main effects of bullying victimization were significant at the student level, with trivial effect sizes, whereas the main effects of bullying victimization were nonsignificant at the school level, with trivial to small effect sizes. In addition, the associations between school engagement and the three factors representing the SEL approach (i.e., TS, SS, and SEL_I) were found to be stronger than the association between school engagement and bullying victimization, irrespective of the type of bullying victimization included in the models. This was true at both the student and school levels. These findings are discussed below.

A Multilevel Understanding of School Engagement and Bullying Victimization

The significant multilevel main effects of demographic variables, bullying victimization, and factors representing the SEL approach (i.e., TS, SS, and SEL_I) on

school engagement are consistent with current theoretical and conceptual frameworks of school engagement and bullying victimization. These frameworks have been developed to better understand how individual and ecological factors help promote positive student engagement outcomes and prevent negative developmental outcomes. For example, Furlong et al. (2003) proposed a conceptual framework, in which four contexts for school engagement outcomes were described. These four contexts were (a) students; (b) peers, particularly support among peers; (c) classrooms, particularly support from teachers; and (d) the school environment, including both the physical environment and school climate. To one extent or another, predictors in the present study entailed each of these four contexts; thus, findings support Furlong and colleagues' conceptual framework. The multilevel results of demographic variables also support a transactional developmental-ecological framework of development in which youth functioning is viewed as being influenced by ongoing and reciprocal interactions between individuals and their environments (Bronfenbrener, 1986; Sameroff, 2000). Similar to Furlong and colleagues' conceptual framework, the transactional developmental-ecological framework recognizes that students' school engagement is optimized by supportive and positive relationships with peers, teachers, and parents (Brown, Mounts, Lamborn, & Steinberg, 1993; You & Sharkey, 2009).

The multilevel main effects of bullying victimization on school engagement were examined concurrently with the effects of the individual student's gender, race-ethnicity, school demographic factors, student-student relationships, teacher-student relationships, and SEL instructional techniques. The significant main effects found for bullying victimization on school engagement are not only consistent with a transactional developmental-ecological framework but also with the popular social-ecological theory that guides much of the current research on bullying (Espelage &

Swearer, 2004). Similar to transactional theory, social-ecological theory posits that bullying does not occur in isolation, but it is a phenomenon that is encouraged and inhibited as a result of complex relationships between the individual and the family, peer group, school, community, and culture in which one is embedded (Espelage & Swearer, 2004).

A common theme shared by the theoretical and conceptual frameworks above is that school engagement and bullying victimization do not occur in isolation, but are the result of complex relationships between individuals and multiple layers of environmental and relational contexts. Thus, it is important to take both individual factors and multilevel contextual factors into consideration when examining predictors of school engagement and the effects of bullying victimization. Likewise, it is important to target both individual and contextual factors when implementing programs for promoting school engagement and preventing bullying (Rigby & Slee, 2008; Smith & Ananiadou, 2003; Stevens, De Bourdeaudhuij, & Van Oost, 2000; Vreeman & Carroll, 2007).

Stronger Relation of the SEL Approach to School Engagement Compared to Bullying Victimization

When the main effects of the SEL approach and bullying victimization on school engagement were examined concurrently, moderate to large effect sizes were found in the association between the three factors representing the SEL approach (i.e., TS, SS, and SEL_I) and school engagement, whereas trivial to small effect sizes were found in the association between bullying victimization and school engagement. This was found at both the student and school levels. There are two likely reasons why these differences in effect sizes emerged. On the one hand, bullying victimization is a risk factor for student learning and social-emotional development, having been shown

to be related strongly to such negative outcomes as internalizing and externalizing problems and low academic difficulties (Hawker & Boulton, 2000; Juvonen et al., 2000; Reijntjes et al., 2010; Swearer et al., 2011). On the other hand, school engagement is considered as a strength-based construct, having been shown to be related strongly to student positive outcomes such as higher academic achievement and school completion, and higher personal sense of well-being (Estell & Perdue, 2013; Furlong et al., 2003). Because bullying victimization is a risk factor and school engagement is a strength-based construct, the linkage between bullying victimization and school engagement is not as direct and natural as the linkage between school engagement and other positive factors or outcomes. That is, in contrast to bullying victimization, the measures of student-student relationships, teacher-student relationships, and teachers' use of social-emotional instructional techniques consist of items with positive statements that emphasize the strengths of individuals and schools related to the SEL approach (e.g., "Teachers care about their students," "Students are friendly with each other," "Students are taught to feel responsible for how they act.") The same is true with the measure of school engagement.

According to the resilience model, the transition from student risk, such as bullying victimization, to positive student outcomes, such as school engagement, requires extra assets within individual students and their environments that have the power to alter a pathway of development, through what has been called turning point, from a negative to a positive trajectory (Lee, Cheung, & Kwong, 2012; Sampson & Laub, 1993; Sharkey, You, & Schnoebelen, 2008). In comparison to the process from bullying victimization and school engagement, the association between the three variables representing the SEL approach and school engagement seems to be more direct, as the association evolves in a more natural trajectory from positive factors to

positive outcomes.

Stronger Main Effects at the School Level than at the Student Level

The main effects of TS, SS, and SEL_I on school engagement at the school level were found to be stronger than the main effects at the student level. This is consistent with the position of many researchers that school engagement is not an attribute of the student, but rather a state of being influenced greatly by contextual factors such as policies and practices of the school and family and peer interactions (Sinclair, Christenson, Lehr, & Anderson, 2003). This finding also highlights the need for multilevel studies examining the effects of factors beyond the student level on school engagement, such as classroom, school, peer, and home factors.

Multilevel Moderation Effects of Teacher-Student Relationships

When the multilevel moderation effects of TS, SS, and SEL_I in the association between bullying victimization and school engagement were examined, it was found that the student-level association between bullying victimization and school engagement was moderated significantly by student-level teacher-student relationships ($TS_{student\ level}$), but not by student-level student-student relationships ($SS_{student\ level}$) and teachers' use of SEL instructional techniques at student level ($SEL_I_{student\ level}$). Moreover, the school-level association between bullying victimization and school engagement was not moderated by either school-level teacher-student relationships ($TS_{school\ level}$), or student-student relationships ($SS_{school\ level}$), or teachers' use of SEL instructional techniques ($SEL_I_{\ school\ level}$). When the cross-level moderation effects were examined, visual presentations indicated that $TS_{school\ level}$ has a potentially meaningful moderation effect in the student-level association between bullying victimization and school engagement, although the cross-level moderation effect

was not statistically significant.

The statistically significant moderation effect of $TS_{student\ level}$ and the meaningful, yet not statistically significant moderation effect of $TS_{school\ level}$ in the student-level association between bullying victimization and school engagement, together with significant multilevel main effects of teacher-student relationships and bullying victimization on school engagement, suggest that teacher-student relationships may function as a promotive factor, rather than a buffer factor in school engagement. Promotive factors promote positive developmental outcomes and decrease negative developmental outcomes regardless of adversity or risk (Leffert, Benson, Scales, Sharma, & Drake, 1998; Sampson & Laub, 1993), whereas buffer factors are associated with positive outcomes only in the presence of risks (Gore & Eckenrode, 1994). According to Sharkey et al. (2008), research is lacking in the areas of understanding whether factors have a positive influence regardless of level of risk (i.e., promotive factor) or if they are only influential in the presence of risk (i.e., buffer factor). Such information may help guide educators and policy makers in selecting the most effective prevention strategies. The moderation effects found in the current study at both the student-level and school-level in teacher-student relationships provides some important implications in addressing this gap in the research, and are supported by both theory and empirical studies, as discussed next.

First, according to attachment theory children use relationships with significant others to construct views about themselves and the nature of their social world (Bowlby, 1982). These relational representations are carried forward into school and shape children's beliefs about themselves and their social world and help develop critical behavioral and social-emotional competencies (Pianta & Nimetz, 1991). Students' relationships with teachers largely impact their perceptions of social

acceptance and connections with others in school (Baker, 2006). Studies show that when students perceive their teachers as being supportive they report greater social efficacy not only with their teachers but also with their peers (Ryan & Patrick, 2001).

Second, positive teacher-student relationships help establish a positive and supportive school climate, which provides a stronger and wider layer of a support system for children when faced with bullying victimization. Serdiouk, Rodkin, Madill, Logis, and Gest (2015) argued that general teacher-student interactions encompass the emotional climate of the classroom as well as teachers' instructional support and classroom organization, which may affect a broad range of child outcomes. When students perceive their teachers as supportive they report increased social efficacy not only with their teachers, but also with their peers (Ryan & Patrick, 2001). Moreover, in classrooms in which students perceive teacher support, students have higher rates of reciprocated friendships (Gest & Rodkin, 2011) and prosocial behavior (Luckner & Pianta, 2011), experience less bullying (Wei, Williams, Chen, & Chang, 2010), and there is less rejection of aggressive and withdrawn children (Gest & Rodkin, 2011). This is likely due to teachers establishing an environment conducive to the development of positive peer relationships, which includes effective classroom management and the valuing and modeling of prosocial behaviors (Gest & Rodkin, 2011).

Lastly, according to the resilience model, positive outcomes such as school engagement require that students with higher risk factors, including being bullied, experience greater positive support and more protective factors to help them cope with their negative environments (Lee, Cheung, & Kwong, 2012). Thus, for those vulnerable children positive relationships with teachers provide much needed positive support and guidance during times of stress and hardship (Baker, 2006; Birch & Ladd,

1997).

Multilevel Moderation Effects of Teacher' Use of SEL Instructional Techniques

Teachers' use of SEL instructional techniques at the school level (SEL_I$_{\text{school level}}$) was found to have a potentially meaningful moderation effect in the student-level association between bullying victimization and school engagement. This cross-level moderation effect was not statistically significant and the effect sizes were trivial to small, but the visual presentation of the moderation effect indicates that it is meaningful in practice. More specifically, it suggests that the magnitude of the negative association between bullying victimization and school engagement at the student level is increased in schools with higher school-average scores on teachers' use of SEL instructional techniques. In other words, the negative effect of bullying victimization on school engagement is intensified in schools in which students perceive teachers' more frequent use of SEL instructional techniques school-wide. This finding seems contrary to the theories and empirical studies supporting the positive effect of the SEL approach in promoting school engagement and students' resilience (Deci & Ryan, 1985; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Wigfield, Eccles, & Rodriguez, 1998). However, the contradictory findings might suggest that teachers' frequent use of SEL istructional techniques at the school-wide level might indicate a school's weaknesses and needs in areas targeted in the SEL approach. That is, schools in which students report more frequent use of SEL instructional techqniues might be those schools that are less effective in fostering a climate that promotes self-discipline and prosocial behavior. Thus, students in those schools are likely to have a greater need for frequent instruction from teachers to correct their misbehavior and to support their social-emotional learning. Thus, this

seemingly contradictory finding might actually support the positive effect of the SEL approach, with its focus on promoting school engagement and preventing bullying victimization. It also suggests that the measure used for the conceptulization of the SEL approach should be refined in future studies—an issue discussed later in this chapter.

Main and Moderation Effects across Types of Bullying Victimization

The multilevel main effects of bullying victimization on school engagement and the multilevel moderation effects of SEL in the association between bullying victimization and school engagement did not vary significantly as a function of type of bullying victimization (i.e., overall, physical, verbal, and relational). This finding is inconsistent with the findings of previous studies in which differences were found in the associations between the three types of bullying victimization and social-emotional and behavioral outcomes other than school engagement (Hoglund & Leadbeater, 2007; Hoglund, 2007; Prinstein et al., 2001; Storch et al., 2003). For example, in a study of middle school students, victims of relational bullying tended to report internalizing problems and victims of physical bullying tended to report externalizing problems (Hoglund & Leadbeater, 2007; Hoglund, 2007; Prinstein et al., 2001; Storch et al., 2003). The consistent association between bullying victimization and school engagement, irrespective of the subtype of bullying victimization, indicates that the three types of bullying victimization share a large portion of common characteristics of the construct of bullying victimization. This is supported by the high correlations found among the four types of bullying victimization scores at both the student and school levels. The similar magnitude to which each of the four different bullying victimization scores correlated with school engagement also indicates that victims of

bullying are often subjected to more than one form of bullying and thus there might be a similar pattern across bullying victimization scores with respect to the main effects of bullying victimization on school engagement. The consistent correlations between different bullying victimization scores and school engagement also may partially be attributed to school engagement being measured by one score that represented the general construct of school engagement. Although using one general school engagement score was supported by the results of confirmatory factor analyses, it precludes examining the linkage between bullying victimization and specific domains of school engagement.

Practical Implications

In this section, practical implications of the findings for educational policy makers and educators pertaining to strategies for the promotion of school engagement and the prevention of bullying victimization are first discussed. This is followed by a discussion of the limitations of the study and the needs for future research.

Strategies for School Engagement Promotion

Finding significant and meaningful main effects of demographic factors (i.e., gender, race/ethnicity, and grade levels) on school engagement challenges educational policy makers and educators to recognize that school engagement is often a function of various demographic factors at both individual and school levels. The strong grade level differences in school engagement, particularly between elementary and secondary schools, suggest that different policy expectations and standards are warranted at the elementary and secondary school levels. Thus, educational practitioners and educators should apply strategies that are sensitive to grade level differences. Supporting students' adjustment from elementary to middle school is a

particularly important task for educators.

The significant and meaningful multilevel main effects of the SEL approach, as presented by TS, SS, and SEL_I, on school engagement suggest that educational strategies related to these aspects of the SEL approach are promising in promoting school engagement. As reviewed in Chapter 1, the SEL approach incorporates two general sets of educational strategies that encompass TS, SS, and SEL-Instruction: (a) the systematic and quality instruction of SEL skills, and (b) the establishment of a caring and safe learning environment (Collaborative for Academic, Social, and Emotional Learning, 2005; Durlak et al., 2015). Such strategies emphasize the importance of promoting a positive school climate and the systematic instruction of students' social-emotional skills, including those related to school engagement. In the following paragraphs some specific practical strategies for building a positive school climate and improving SEL instruction are discussed.

A positive school climate is critical to school and student success. To build a positive school climate in schools it is important to establish a caring social/relational climate that nurtures positive relationships among students, between students and teachers, and among teachers (Lapan, 2001). A caring and inviting school climate also fosters teachers' willingness to involve themselves with students (Lam & Hui, 2010; Tatar, 1998) and to communicate and collaborate with parents and other school members. To build a positive school climate it is important to establish a school-wide support system. Some important school factors that help establish a school-wide support system include: cooperation and communication among teachers, teacher training, clear procedures and structures, support from the school principal, a well-defined school policy or vision, and a caring and inviting school climate (Aluede, Imonikhe, & Afen-Akpaida, 2007; Ballet & Kelchtermans, 2008; Best, 1999; Hui,

2002).

To improve the effectiveness of social-emotional instruction, it is important to facilitate or enable teachers to integrate socio-emotional instruction into the general curriculum and their daily teaching practices (Bear, 2010). Based on an empirical study among 3,336 Flemish secondary education teachers, Jacob and Strugy (2015) proposed a comprehensive model of integrated social-emotional guidance, recognizing that teachers' task perceptions, professionalization, communication, clear structures and procedures, and the support of school principals are important factors that impact teachers' motivation to integrate socio-emotional instruction into the curriculum and their teaching practices.

Strategies for Bullying Prevention and Intervention

The meaningful cross-level moderation effect of $TS_{\text{student level}}$ in the student-level association between bullying victimization and school engagement highlights the critical and positive influence of cultivating school-wide positive teacher-student relationships in bullying prevention, school engagement promotion, and other school prevention and intervention practices. More specifically, warm and supportive relationships between teachers and students reduce students' emotional distress caused by victimization and promote more positive outcomes. Research shows that within a supportive teacher-student relational context, students feel more comfortable reporting bullying behaviors and confident that the aggressive behaviors will be addressed (Troop-Gordon, 2015). Cultivating positive relationships between students and teachers provides a proactive approach in preventing or limiting opportunities for bullying victimization and fostering empathy toward victimized students (Murray-Harvey & Slee, 2010; Salmivalli, 2010). Positive teacher-student relationships are not

only helpful to students, but also to teachers in their prevention and intervention efforts. With positive relationships established with students who are bullies or victims of bullying, teachers can be more active in examining the relationships between those involved in bullying victimization to determine whether opportunities exist to promote more respect or repair friendships. Teachers also can examine how the broader peer ecology may be structured to deter bullying, such as diminishing status hierarchies that emphasize popularity, cultivating friendships among aggressive and nonaggressive children, and fostering norms of standing up to peer aggression (Hamm, 2011; Troop-Gordon, 2015).

Considering that teachers may be in an advantageous position to prevent bullying and promote school engagement, it is important to provide teachers with professional development opportunities to help them recognize the key roles they play in shaping peer relationships. This would include training teachers to better understand the peer ecology of their classroom and the school and to equip teachers with strategies for preventing and addressing bullying victimization. This should include specific concrete steps teachers can take to minimize peer aggression and foster the health and well-being of victimized children (Serdiouk et al., 2015; Troop-Gordon, 2015). For example, Troop-Gordon suggested that teachers are best prepared to support students who are bullied when they view victimization as nonnormative, exhibit empathy for the victims, feel efficacious in addressing the victimization, and are aware of the social dynamics in their classrooms. Schlosser (1992) suggested that teachers can help improve relationships with students by (a) recognizing students' needs, (b) fostering discussions relevant to students' experiences, (c) listening without judgment, and (d) inviting students to talk about their problems outside of the classroom. Moreover, Serdiouk et al. (2015) suggested a network-related teaching

approach to help teachers make explicit efforts to understand and influence not only teacher-student dynamics, but also social dynamics of the classroom that are pertinent to peer ecologies (Gest & Rodkin, 2011). Such practices include teachers' knowledge of peer relations (e.g., who bullies whom, who is popular), teachers' efforts to prevent bullying/aggression, and teachers' efforts to reduce status hierarchy and inequality among students (Serdiouk et al., 2015).

The potentially meaningful moderation effect of $SEL_{school\ level}$ in the student-level association between bullying victimization and school engagement indicates that the negative association between bullying victimization and school engagement is mitigated with teachers' less frequent use of SEL instructional techniques school-wide. This finding implies that the SEL approach should emphasize a more proactive approach in preventing bullying and other behavioral problems by developing a school environment that helps foster students' social-emotional learning, rather than a reactive approach that relies only on teacher-directed instructional strategies of behavior management to address bullying victimization and other behavioral problems. The proactive SEL approach helps build a set of stronger and long-lasting assets within students across social-emotional, cognitive and behavioral domains to help them cope with stress and hardship in their school life and beyond. To improve the proactiveness of the SEL approach, it is important for teachers to facilitate students' learning in core social-emotional skills through the general curriculum, to improve students' abilities in identifying their social-emotional strengths and weaknesses in their daily teaching practices, and to encourage students' use of self-monitoring and other student-oriented strategies to manage their behavior with support from teachers and other school staff (Bear, 2010). In addition, it is equally important to foster a positive school climate that emphasizes not only positive relationships

within schools, but also structure and order within schools. It is important that students feel safe in school, but that they also understand school rules and expectations and view them as fair.

Limitations and Future Research

In this final section, limitations of the study are reviewed and suggestions are offered for future research. Limitations address (a) the cross-sectional design of the study, (b) the multilevel nature of the study, (c) complexity in conceptualizing and measuring school engagement, (d) complexity in conceptualizing and measuring the SEL approach, (e) use of self-reports, and (f) complexity in interpreting the significance levels and effect sizes of cross-level moderation effects.

Cross-Sectional Design of the Study

The study was cross-sectional in design. Whereas a cross-sectional design provides useful information about associations between variables at one time point, it has several limitations. Primary among them is that casual relationships cannot be drawn (Vallerand, Pelletier, & Koestner, 2008). Another major limitation of a cross-sectional design is that it may mask the interplay and dynamics of associations between variables, such as between bullying victimization and school engagement (You & Sharkey, 2009). For example, the association between bullying victimization and school engagement is likely bidirectional and reciprocal in nature, which was not examined in the current study.

Given the limitations of a cross-sectional design, it is recommended that future research incorporate longitudinal designs, in which measures of predictors (i.e., BV, TS, SS, and SEL_I), moderators (i.e., TS, SS, and SEL_I), and school engagement are collected at different time points. This is necessary to investigate the casual

relationships between bullying victimization, the SEL approach, and school engagement. Longitudinal designs provide a better approach to examining factors that influence changes in school engagement over time, including the rate of growth. For example, You and Sharkey (2009) used a longitudinal approach to examine student- and school-level factors related to adolescents' initial status and rate of growth in school engagement. Significant factors at the student level were students' locus of control, self-esteem, peer academic value, parental expectation, parent-child communication, socio-economic status, previous grades, and dropout history of friends. Significant factors at the school level were teachers' rules for homework, teacher support, and school safety.

Multilevel Nature of the Study

Analyses at both the individual and school levels were conducted to examine the association between bullying victimization, the SEL approach, and school engagement. Although there are many advantages of multilevel analyses, as discussed in Chapter 1, two particular limitations of multilevel analyses in the current study should be noted: (a) not all important variables were included, and (b) the confounding effects of aggregating data. These two limitations are discussed briefly below.

According to Furlong and colleagues' (2003) conceptual framework of school engagement, there are important contexts within and outside of schools that are associated with bullying victimization and school engagement, including the contexts of peers, the classroom, families, school districts, and the community. Although it was beyond the scope of the current study, it would be meaningful for future studies to extend this study's multilevel investigation to other contexts. For example, the multilevel influences of peers, families, and the classroom should be of particular

value in examining relations between bullying victimization and school engagement.

With respect to the confounding effects of aggregating data, school-level variables, such as $TS_{\text{school level}}$, $SS_{\text{school level}}$, and $SEL_I_{\text{school level}}$, were generated by aggregating student-level scores into school-level average scores. Because those aggregated scores were indirectly reported by students, the confound effects of individual characteristics could not be completely removed. To minimize the confound effects caused by aggregating scores, it would be helpful in future studies that classroom-level, school-level, or other multilevel data are collected directly using independent measures at the given level. For example, independent data might be collected through the assessment of peer dynamics, or the assessment of classroom climate and school climate by an independent evaluator. Likewise, independent data from environmental contexts that extend beyond the school system, such as the family and community, might be collected.

Complexity in Conceptualizing and Measuring School Engagement

There has been much discussion among researchers about the conceptualization of school engagement, including differentiation of the various terms used to represent the construct. For example, the terms “school attachment”, “school belonging”, “connectedness”, “sense of community”, and “school membership” are often used interchangeably with “school engagement”. In this study confirmatory factor analysis was conducted to confirm that a bifactor model, with a general factor of school engagement and two specific factors of behavioral/cognitive engagement and emotional engagement, best represented the factor structure of the Delaware School Engagement Scale. Finding a general school engagement factor was helpful in justifying the use of one overall school engagement variable. It allowed for examining

the effects of different subtypes of bullying victimization on one school engagement construct that covers the behavioral-cognitive and emotional domains, while keeping the scope of the study manageable.

Two specific factors of school engagement under the one general factor of school engagement (i.e., behavioral-cognitive engagement and emotional engagement) also were identified in the bifactor model. These two specific factors provide measurement support to extend the current study to fully examine the association between the three specific types of bullying victimization and the two specific dimensions of school engagement. Domain-specific examination of the association between bullying victimization and school engagement might provide meaningful implications for practitioners when intervening with students who experience different types of bullying.

Complexity in Conceptualizing and Measuring of the SEL Approach

The SEL approach was represented by students' perceptions on three factors: teacher-student relationships, student-student relationships, and teachers' use of SEL instructional techniques. These three factors align with two proposed educational strategies of SEL programming: the systematic and quality instruction of SEL skills and the establishment of a caring and safe learning environment (Collaborative for Academic, Social, and Emotional Learning, 2005; Durlak et al., 2015). More specifically, teachers' use of SEL instructional techniques aligns with the first strategy because it emphasizes how teachers directly teach SEL skills. Teacher-student relationships and student-student relationships align with the second strategy in that a positive social-emotional climate helps establish a caring and safe school environment.

In spite of these alignments, based on resilience theory researchers have argued that students' positive outcomes are not only related to external assets, such as the instructional support from teachers and relational support from peers and teachers, but also to internal assets of students, such as students' personal skills and capacities in the cognitive, affective, and behavioral domains (You et al., 2014). Thus, the first educational strategy of the SEL approach should not only emphasize the use of SEL instructional techniques but also target core SEL skill sets. Measuring the core SEL skill sets was beyond the scope of the current study, but it is highly recommended that this be included in future studies.

Researchers have already identified important cognitive, affective, and behavioral skills that should be systematically targeted in SEL programs (Bear, 2015; Durlak et al., 2011; Durlak et al., 2015). For example, Durlak and colleagues presented five interconnected sets of skills (i.e., self-awareness, self-management, social awareness, relationship skills, and responsible decision making). They argued that those skills should be directly taught, modeled, practiced, and applied to diverse situations so that students use them as part of their daily repertoire of behaviors.

In conceptualizing the SEL approach, it is important to include not only core SEL skills, but also school climate factors. This is because both are consistent with two educational strategies most commonly found in the SEL approach: the systematic and quality instruction of SEL skills and the establishment of a caring and safe learning environment (Collaborative for Academic, Social, and Emotional Learning, 2005; Durlak et al., 2015). The conceptualization of the SEL approach in the present study included only two school climate factors, which were teacher-student relationships and student-student relationships. These two factors largely represent the

social-relational climate of the school, often also referred to as social support, social action, or responsiveness.

According to Stockard and Mayberry's (1992) theoretical framework of school climate, social action constitutes one of two broad dimensions of school climate. The other is social order. The dimension of social action emphasizes everyday social interactions among teachers, staff, and students (i.e., the presence of caring, understanding, concern, and respect). In contrast, social order is similar to what other researchers often refer to as structure, or demandingness, with its primary goal being to curtail behavior problems and promote safety. Social support and social order are equally important in representing the construct of school climate. In the present study, the dimension of social action was represented by the measures of teacher-student relationships and student-student relationships. However, there was no measure of social order. Thus, including other important school climate factors under the domain of social order, such as school safety, fairness of school rules, and clarity of school expectations would help improve the comprehensiveness of the conceptualization and measurement of the SEL approach (Bear et al., 2011; Bear et al., 2014).

Use of Self-Reports

The data relied mainly upon self-report information from students to assess school engagement, bullying victimization, and the SEL approach. From the perspective of social-ecological theory, individuals' perceptions of the social environment, and especially social transactions, are considered to be critical in understanding human behavior (Bandura, 1986, 1997; Bronfenbrenner, 1979). Data based on students' self-perceptions are highly valued not only in research studies, but also in program evaluation and school reform efforts because use of such data avoids

possible bias from teachers and other school staff. Moreover, research and theories suggest that students' perceptions of their classroom or school environment are more important than objective indicators in understanding student motivation, adjustment, and well-being (Connell & Wellborn, 1991; Eccles et al., 1993a).

Although self-report measures are commonly used to assess school engagement, bullying victimization, teacher-student relationships, student-student relationships, and the SEL approach in general (Baker, 2006; Bear et al., 2014; Park, 2012), validity concerns about their use have been widely raised (Espelage & Swearer, 2003; Ladd & Kochenderfer-Ladd, 2002). First, self-reports may lack objectivity, as they depend upon students' subjective perceptions and attitudes, as well as the ability to selectively remember details of specific encounters. For example, in assessing bullying victimization, bullying victims may intentionally not recall an incident of victimization because it is embarrassing or upsetting (Ladd & Kochenderfer-Ladd, 2002), and bullies may minimize their involvement in bullying episodes to protect themselves (e.g., Craig & Pepler, 1998; Smith & Sharp, 1994). Second, students may be influenced by social demands to answer in a socially desirable way, thus introducing bias into the results (Adams, 2005). For example, students may experience social pressure when they report instances of victimization, especially when assessment measures are group administered in a classroom setting (Austin & Joseph, 1996). Third, self-report measures assume that students can read and understand the directions of the survey, the definition of the different points on the Likert scale, and the meaning of items. However, students' understanding and interpretations in the above areas vary widely depending on their abilities and personal experiences (Beaton, Bombardier, Guillemin, & Ferraz, 2000).

To address the concerns above, multiple sources of information (e.g., students, teachers, and parents) and multiple methodologies should be used in future studies to provide a more robust and valid assessment of school engagement, bullying victimization, and the SEL approach (Fredricks et al., 2004). For example, reports from students should be combined with reports from teachers, peers, and parents, as well as with direct observations in classrooms and schools.

Complexity in Interpreting the Significance of Cross-Level Moderation Effects

When the cross-level moderation effects of $TS_{school\ level}$, $SS_{school\ level}$, and $SEL_I_{school\ level}$ were examined, the visual presentations indicate that the cross-level moderation effects of $TS_{school\ level}$ and $SEL_I_{school\ level}$ in the student-level association between bullying victimization and school engagement are potentially meaningful in practice. However, the coefficient estimates of these two cross-level moderation effects were not statistically significant ($ps > .05$) and their effect sizes ranged from trivial to small, according to the commonly used criteria for the interpretation of effect size (Rosenthal & Rosnow, 1984). The inconsistency between the visual presentations and the statistical estimates of the significance levels and effect sizes of the effects might be related to the complexity in estimating the statistical power for the cross-level moderation effects. Researchers have stated that the power to detect significant cross-level interactions is quite modest and is influenced by various factors, such as the magnitude of the cross-level interaction, the standard deviation of lower level slopes, the lower and upper level sample sizes, true distributions of slopes, and standardization and centering techniques (Mathieu, Aguinis, Culpepper, & Chen, 2012). Due to various factors influencing the power analysis, the criteria used to determine the magnitude of effect sizes should be used with caution.

In the future studies examining cross-level moderation effects, power analysis, such as use of ML Power Tool (see http://mypage.iu.edu/~haguinis/crosslevel.html), should be performed prior to collecting data to determine how power might change as a result of using different research designs and sample sizes (Mathieu et al., 2012). Moreover, the selection of criteria for interpreting the magnitude of effect sizes should be based on extensive review of prior work in the substantive areas. The selection of sample sizes should not rely solely on general rules of thumb for multilevel samples, such as the rule that one should have at least 30 upper level units with at least 30 lower level entities in each (Kreft & de Leeuw, 1998). Such sample sizes are absolute minimums for estimation, but will not yield adequate power for detecting cross-level moderation. As such, larger samples should be employed as much as possible (Mathieu et al., 2012).

Conclusion

In recent decades, the negative outcomes associated with being a victim of bullying have sparked increased public concerns. A primary concern is students' disengagement from school. To address this concern, the multilevel main effects of student-level and school-level demographic factors, and the multilevel main effects of bullying victimization and the SEL approach, as represented by teacher-student relationships, student-student relationships and teachers' use of SEL instructional techniques, on school engagement were examined. Multilevel moderation effects of the SEL approach in the association between bullying victimization and school engagement also were examined.

Results suggest that school engagement is not only influenced by demographic characteristics of students and schools, but also by more malleable factors, particularly

factors promoted by the SEL approach. Such factors include positive teacher-student relationships, positive student-student relationships, and teachers' frequent use of SEL instructional techniques. Moreover, results indicate that the negative effects of bullying victimization on school engagement at the student level appears to be mitigated by students' perceptions of the positive teacher-student relationships school-wide. However, the negative effect of bullying victimization on school engagement appears to be intensified in schools by students' perception of teachers' more frequent use of SEL instructional techniques school wide.

The findings support transactional developmental-ecological theory and social-ecological theory in understanding the phenomenon of bullying victimization and school engagement. They also support the whole-school approach in school engagement promotion and bullying prevention and intervention. Moreover, they suggest that it is important to develop a comprehensive conceptualization and measure of the SEL approach that includes several important components, such as core sets of social-emotional learning skills, an appropriate measure of SEL instruction, key school climate factors that foster a caring and safe school environment.

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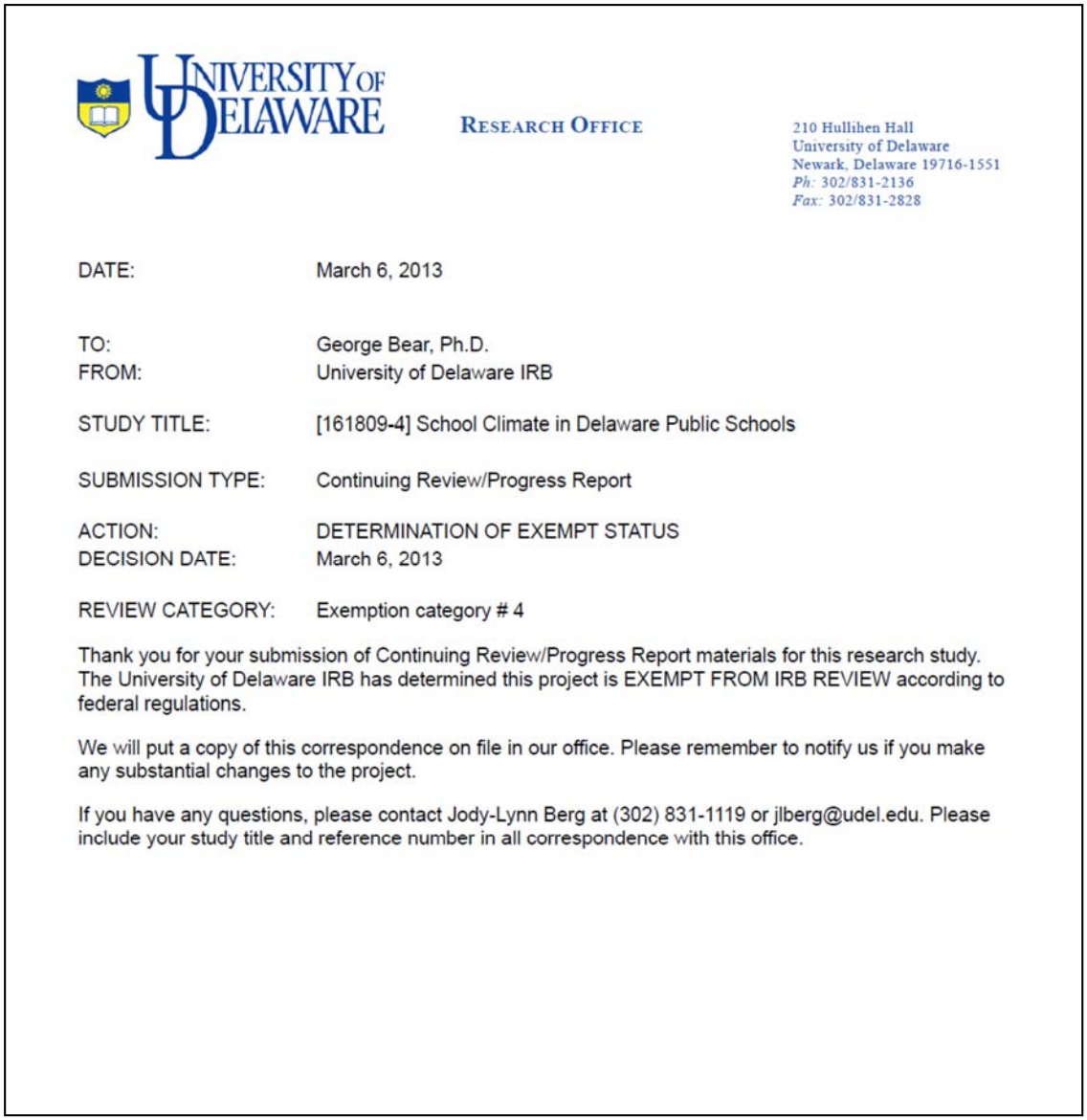
Appendix A

APPROVAL LETTER FROM THE UNIVERSITY'S INSTITITIONAL REVIEW BOARD



UNIVERSITY OF DELAWARE

RESEARCH OFFICE

210 Hullihen Hall
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Newark, Delaware 19716-1551
Ph: 302/831-2136
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DATE: March 6, 2013

TO: George Bear, Ph.D.
FROM: University of Delaware IRB

STUDY TITLE: [161809-4] School Climate in Delaware Public Schools

SUBMISSION TYPE: Continuing Review/Progress Report

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: March 6, 2013

REVIEW CATEGORY: Exemption category # 4

Thank you for your submission of Continuing Review/Progress Report materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Jody-Lynn Berg at (302) 831-1119 or jlberg@udel.edu. Please include your study title and reference number in all correspondence with this office.

Appendix B

ITEMS OF THE SCALES AND SUBSCALES USED IN THIS STUDY

1. Items of the factor of "Bullying Victimization"

1) Items for the factor of "Physical Bullying Victimization"

III-2. I was pushed or shoved on purpose.

III-5. I was hit or kicked and it hurt.

III-8. A student stole or broke something of mine on purpose.

III-11. A student threatened to harm me.

2) Items for the factor of "Relational Bullying Victimization"

III-3. Students left me out of things to make me feel badly.

III-6. A student told or got others not to like me.

III-9. A student got others to say mean things about me.

III-12. Students told another student not to be friends with me because the other students didn't like me.

3) Items for the factor of "Verbal Bullying Victimization"

III-1. I was teased by others saying hurtful things to me.

III-4. A student said mean things to me.

III-7. I was called names I didn't like.

III-10. Hurtful jokes were made up about me.

2. Items for the factor of "School Engagement"

IV-1. I pay attention in class.

IV-2. I feel happy in school.

IV-4. My school is a fun place to be.

IV-5. I try my best in school.

IV-6. I like this school.

IV-7. I turn in my homework on time.

IV-8. I like most of my teachers.

IV-9. I get good grades in school.

IV-10. I like students who go to this school.

3. Items for the factor of "Teacher-Student Relationships"

I-7. Teachers care about their students.

I-17. Teachers listen to students when they have problems.

I-22. Adults who work in this school care about the students.

I-33. Teachers like their students.

4. Items for the factor of "Student-Student Relationships"

I-11. Students are friendly with each other.

I-16. Students care about each other.

I-30. Students treat each other with respect.

I-31. Students get along with each other.

5. Items for the factor of "Teachers' Use of SEL Instructional Techniques"

II-3. Students are taught to feel responsible for how they act.

II-6. Students are taught to understand how others think and feel.

II-9. Students are taught that they can control their own behavior.

II-12. Students are taught how to solve conflicts with others.

II-13. Students are taught they should care about how others feel.